

# Report

19 October 2023

To		Contact No.	
Copy to	-	Email	
From		Project No.	12605152
Project Name	Apron Development - Alpha Apron North & Hotel Apron South Design & Planning Services		
Subject	Limited Contamination Investigation – Alpha Apron North and Hotel Apron South		

## 1. Introduction

Australia Pacific Airports (Melbourne) Pty Ltd (APAM) engaged GHD Pty Ltd (GHD) as design consultants to undertake the concept design for Alpha Apron North (Package A) and the concept and schematic design for the Hotel Apron South (Package B). The design services included a limited soil assessment which was completed opportunistically during the geotechnical investigations to provide an understanding of the contamination status within the proposed Package areas. The assessment was intended to inform soil management, reuse, and disposal options during the design and construction phases of the project.

This report summarises the limited assessment of soils encountered for Package A and Package B.

### 1.1 Purpose of this report

The purpose of this report was to complete a limited soil assessment for each Package area in general accordance with the National Environment Protection (Assessment of Site Contamination) Measure (NEPM) 1999, as amended 2013 (ASC NEPM). The assessment will be used to inform soil management, reuse, and disposal options during the design and construction phase.

## 2. Scope and limitations

### 2.1 Scope of work

The scope of work undertaken in the development of this report includes:

- Desktop review of available information for each investigation area.
- Opportunistic collection of soil samples from 10 geotechnical boreholes.
- Laboratory analysis of collected soil samples at a NATA Accredited Laboratory.
- Preparation of this Limited Contamination Investigation Report.

The soil sampling locations described in this report were based on a geotechnical investigation and were not specifically located for contamination purposes. Therefore, GHD makes no assurance that the maximum level of contamination has been identified. The result is considered indicative only.

## 2.2 Limitations

This report has been prepared by GHD for Australia Pacific Airports (Melbourne) Pty Limited and may only be used and relied on by Australia Pacific Airports (Melbourne) Pty Limited for the purpose agreed between GHD and Australia Pacific Airports (Melbourne) Pty Limited as set out in section 1.1 of this report.

GHD otherwise disclaims responsibility to any person other than Australia Pacific Airports (Melbourne) Pty Limited arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

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

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

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

GHD has prepared this report on the basis of information provided by Australia Pacific Airports (Melbourne) Pty Limited and others who provided information to GHD, which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

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

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

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

## 3. Desktop review

Fourteen contamination or geotechnical investigation reports were made available by APAM for review. Three of these reports included soil and groundwater data within or near the investigation area, which has been described in Table 1 below. In summary, the desktop review indicated that:

- Historical soil results were limited in coverage across the investigation area. Analytical results indicated some elevated Per- and polyfluoroalkyl substances (PFAS) concentrations (PFOS, PFOA, and PFHxS). Ground contaminants are likely to result in additional management requirements for construction earthworks and may result in limited reuse or disposal of excavated soils.
- Groundwater laboratory analysis across both design areas reported elevated Chromium (VI), nitrate (as N), total nitrogen (as TN), copper, zinc, TRH (C<sub>16</sub>-C<sub>34</sub>), PFHxS+PFOS, and PFOS.
- Groundwater across the airport is likely to be approximately 20 – 23 m below ground level (BGL), and as such it is unlikely to be encountered during shallow apron construction earthwork.



Table 1 Summary of contamination desktop review

Package Area	Report	Objective	Relevant sampling locations	Summary of results
Alpha Apron North (Package A)	Draft PFAS Assessment, Melbourne Airport, VIC, Cardno 27 November 2017	Provide the client with preliminary advice on the nature and extent of PFAS impact in soil, sediment, and groundwater at the site and the potential for off-site impacts	GW016	<p><u>Soil Results</u></p> <p>Two soil sample locations were located in the vicinity of the area, however, the report does not identify the sample location IDs.</p> <p><u>Groundwater Results</u></p> <p>GW016:</p> <ul style="list-style-type: none"> <li>Groundwater measured at approximately 20 m bgl (97.67 m AHD).</li> <li>PFAS groundwater concentrations were reported above the laboratory limit of reporting (PFOS 0.15 µg/L, PFOA 0.008 µg/L, PFHxS 0.17 µg/L).</li> </ul>
	RDP Geotech Interpretive Report, Golder Dec 2017	The soil contamination portion of the investigation was completed to assess the potential contamination within site soils which may impact the suitability of the material to be reused as fill within the airport precinct.	GA17-A-TP199 GA17-A-TP200 GA17-A-TP201 GA17-A-BH084	<p><u>Soil Results</u></p> <p>Shallow fill / natural basaltic clays were identified at each location, with basalt encountered between 0.60 and 0.70 m bgl.</p> <p>Soil analysis was limited to two locations. The results are summarised below.</p> <p>GA17-A-TP201:</p> <ul style="list-style-type: none"> <li>Nickel (66 – 120 mg/kg) exceeded the IWRG621 Waste Classification Criteria for Fill Material (60 mg/kg).</li> <li>PFAS and broad semi and volatile organics screens were reported to be below the laboratory limits of reporting.</li> </ul> <p>GA17-A-BH084:</p> <ul style="list-style-type: none"> <li>Nickel (77 – 110 mg/kg) exceeded the IWRG621 Waste Classification Criteria for Fill Material (60 mg/kg).</li> <li>PFAS and broad semi and volatile organics screens were reported to be below the laboratory limits of reporting.</li> </ul> <p><u>Groundwater Results</u></p> <p>None available.</p>
	Melbourne Airport's Third Runway (M3R), FINAL DRAFT, Senversa 2020	The objective of this assessment was to complete supplementary contaminated land investigation works for the M3R north-south alignment and consolidate the findings with existing data to inform project	GW016	<p><u>Soil Results</u></p> <p>None applicable.</p> <p><u>Groundwater Results</u></p> <p>GW016:</p> <ul style="list-style-type: none"> <li>The groundwater well was previously sampled by Cardno in November 2017.</li> <li>Groundwater measured at approximately 20 m bgl (97.411 m AHD).</li> <li>PFOS groundwater concentrations were reported at 0.02 µg/L, which was above the ecological investigation limit (95% Ecosystem Protection).</li> </ul>

Package Area	Report	Objective	Relevant sampling locations	Summary of results
		risks and propose a Major Development Plan (MDP).		<ul style="list-style-type: none"> <li>Concentrations of Total Nitrogen (1.2 mg/L) and Chromium (VI) (0.01 mg/L) were reported above the adopted assessment criteria.</li> </ul>
Hotel Apron South (Package B)	Draft PFAS Assessment, Melbourne Airport, VIC, Cardno 27 November 2017	Provide the client with preliminary advice on the nature and extent of PFAS impact in soil, sediment, and groundwater at the site and the potential of off-site impacts.	SS18 BH396 GW021	<p><u>Sediment Results</u></p> <p>SS18:</p> <ul style="list-style-type: none"> <li>Metals and broad semi and volatile organics screens were reported below the laboratory limits of reporting and/or the adopted assessment criteria.</li> <li>PFOS and PFOA were reported above the laboratory limits of reporting (3.3 µg/kg and 0.1 µg/kg respectively), however, both were below the adopted commercial/industrial and Airport Interim Framework assessment criteria.</li> </ul> <p><u>Soil Results</u></p> <p>BH396:</p> <ul style="list-style-type: none"> <li>Heavy Metals were reported below the laboratory limits of reporting and/or the adopted assessment criteria.</li> <li>PFAS concentrations were reported above the laboratory limit of reporting (PFOS 1.1 µg/kg, PFOA 0.2 µg/kg, PFHxS 0.2 µg/kg). All results were below the adopted assessment criteria.</li> </ul> <p><u>Groundwater Results</u></p> <p>GW021:</p> <ul style="list-style-type: none"> <li>Groundwater measured at approximately 23 m bgl (84.81 m AHD).</li> <li>PFAS groundwater concentrations were reported above the laboratory limit of reporting (PFOS 0.17 µg/L, PFOA 0.021 µg/L, PFHxS 0.87 µg/L).</li> </ul>
	Melbourne Airport's Third Runway (M3R), FINAL DRAFT, Senversa 2020	The objective of this assessment was to complete supplementary contaminated land investigation works for the M3R north-south alignment and consolidate the findings with existing data to inform project risks and propose a Major Development Plan (MDP).	GW021	<p><u>Soil Results</u></p> <p>None applicable.</p> <p><u>Groundwater Results</u></p> <p>GW021:</p> <ul style="list-style-type: none"> <li>The groundwater well was previously sampled by Cardno in November 2017.</li> <li>Groundwater measured at approximately 23 m bgl (84.808 m AHD).</li> <li>Chromium (VI), nitrate (as N), Total nitrogen (as N), copper, zinc, TRH (C<sub>16</sub>-C<sub>34</sub>), PFHxS+PFOS, and PFOS were reported at concentrations exceeding the adopted assessment criteria.</li> </ul>

## 4. Methodology

Soil sampling was undertaken in general accordance with ASC NEPM, PFAS NEMP 2.0 guidelines, and GHD Quality Assurance and Quality Control (QA/QC) procedures. The soil sampling work comprised:

- Collection of shallow soil samples (0.1 m, and 0.5 m) directly from geotechnical sampling locations using a hand auger. Samples at approximately 1.0 m below ground level (m bgl) were collected directly from the standard penetration test (SPT) cores (and from undisturbed material).
- Collection of quality assurance (QA) and quality control (QC) samples.
- Sampling using new disposable gloves for each sample, which was placed directly into new glass/PFAS free jars prepared and provided by the laboratory. Sampling equipment (hand auger and sampling tools) were cleaned and washed using phosphate- and PFAS-free Liquinox and deionised water.
- Samples were immediately placed into ice chests and chilled with ice for transport to the nominated NATA-accredited laboratory (ALS Environmental for primary analysis and Eurofins mgt for secondary samples). Chain-of-custody documentation was prepared for sample transfer from the site to the laboratory.
- Laboratory analysis of the collected soil samples for a broad screen of contaminants (details provided in Table 2 below).

Equipment calibration certificates and borehole logs are provided in Attachment 2 and Attachment 3, respectively.

Table 2 Analytical schedule

Site	No. Locations	Depths (m)	No. Samples tested	Analysis
<b>Primary Samples</b>				
Alpha Apron North (Package A)	5 x Soil Locations (AAN-BH01, AAN-BH02, AAN-BH03, AAN-BH04, AAN-BH05)	0.1, 0.5, 1.0, and every 1.0 m thereafter	10	2 x EPA Publication 1828 Screen <sup>1</sup> 6 x Reduced Screen <sup>2</sup> 2 x 8 Metals 10 x PFAS (28 analytes)
Hotel Apron South (Package B)	2 x Pavement Locations (HAS-BH02, HAS-BH03)	0.0	2	2 x PFAS (28 analytes)
	5 x Soil Locations (HAS-BH02, HAS-BH03, HAS-BH04, HAS-BH05, HAS-BH06)	0.1, 0.5, 1.0, and 2.0 m	10	2 x EPA Publication 1828 Screen <sup>3</sup> 8 x Reduced Screen <sup>2</sup> 10 x PFAS (28 analytes)
<b>QC Samples</b>				
5% Blind Samples	-	-	1	1 x Reduced Screen <sup>2</sup> 1 x PFAS (28 analytes)
5% Field Splits	-	-	2	1 x Reduced Screen <sup>2</sup> 1 x PFAS (28 analytes) 2 x Leachate
Rinsate Blanks	One per day	One per day	2	2 x Reduced Screen <sup>2</sup> 1 x PFAS (28 analytes)
Trip Blanks	One per batch	One per batch	2	2 x BTEX, TPH (C <sub>6</sub> -C <sub>9</sub> ).
<b>Total</b>	-	-	<b>29</b>	-
Notes:				

Site	No. Locations	Depths (m)	No. Samples tested	Analysis
<sup>1</sup> 1828.2 Screen includes: TRH, PAH, phenols, OCP, PCB, VOC, vinyl chloride, Metals (As, Cd, Cr, Cu, Ni, Pb, Hg, Ag, Sn, Mo, Se, Zn), Cr6+, CN, total fluoride, pH				
<sup>2</sup> Reduced Screen: Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg), TRH, BTEX, PAH				

## 5. Assessment criteria

Soil (including leachate) assessment criteria adopted for this project were based on the anticipated construction activities associated with the apron development and ongoing commercial/industrial land use as described in the purpose of this assessment (Section 1.1). A summary of each criterion and rationale is provided in Table 3.

Table 3 Adopted Soil Assessment Criteria

Title	Level	Abbr.	Reference	Use
NEPM 2013 EIL D	Commercial / Industrial	EIL D	Schedule B1	Assessment of ecological receptors
NEPM 2013 ESL D	Commercial / Industrial, Coarse Soil	ESL D	Schedule B1 Table 1B(6)	
NEPM 2013 HIL D	Commercial / Industrial	HIL D	Schedule B1 Table 1A(1)	Assessment of construction worker health and ongoing use of the site.
NEPM 2013 HSL D	Commercial / Industrial, Coarse Soil	HSL D	Schedule B1 Table 1A(3)	
NEMP 2020 2.0 – HIL	Commercial / Industrial	NEMP HIL D	PFAS NEMP 2.0 Table 2. Human health investigation levels for soil	
APAM Melbourne Airport PFAS Management Framework	-	APAM PFAS Management Framework	APAM Melbourne Airport PFAS Management Framework 2022, Table 2 Reuse and Gate 11 Facility management levels and requirements	Airport site-specific soil management requirements
AEPR 1997	General areas	AEPR 1997	Airports (Environment Protection) Regulations 1997. Australian Federal Government, Canberra	
AEPR 1997	Areas of environmental significance	AEPR 1997		
EPA Publication 1828.2	-	Publication 1828.2	EPA Publication 1828.2, Waste Disposal Categories, Table 2 Waste Disposal contamination concentrations, and leachable concentrations, Table 3 Fill material contamination total concentration upper limit	Off-site waste classification
Victoria Government Gazette, PFAS Designation	-	PFAS Designation	Victoria Government Gazette, 2022, Classification of PFAS-Impacted Soil, Designation	
NEMP 2020 2.0 – Landfill Criteria	-	NEMP Landfills	PFAS NEMP Version 2.0 Table 7, Landfill acceptance criteria	



## 6. Results

### 6.1 Field observations

A generalized subsurface profile is presented in Table 4 below. Detailed soil logs for each sample location are included in Attachment 3. The generalised profile is based on boreholes completed around the existing warehouse structures and the extent of fill and disturbed soils beneath the existing structures is not known.

No hydrocarbon staining or significant olfactory signs of contamination were identified during the field sampling program, including inert waste. Field screening of soil samples using a Photo Ionisation Detector (PID) did not yield evidence of gross contamination, with all results below 10 ppm.

Table 4 Generalized ground profile

Unit ID	General Soil Description from Field Logs	Depth from (m)	Depth to (m)
<b>TOPSOIL</b> <sup>1</sup>	Clay trace sand; fine-grained sand; roots and rootlets	0.00	0.05
<b>FILL</b> <sup>2</sup>	Gravelly Clay with sand, Sandy Gravel; grey, brown; fine to coarse-grained, sub-angular to sub-rounded sand; sub-angular to angular gravel of basalt	0	0.10-0.60
<b>RESIDUAL SOIL</b>	Clay trace sand, Clay trace sand, and gravel, Gravelly Clay trace sand; grey-brown; fine-grained, sub-angular gravel of basalt; high plasticity fines	0.05-0.60	1.50-1.80
<b>Extremely weathered Basalt</b>	Recovered as Clay with sand, Clayey gravel, Sandy Clay trace gravel, sand, brown-orange, red-brown, pale brown; fine to coarse-grained, sub-angular to sub-rounded sand of quartz, sub-angular to angular gravel of basalt	1.50-1.80	3.00(EOH)-4.00(EOH)
Notes: EOH – End of hole <sup>1</sup> Topsoil encountered in borehole AAN-BH01 only <sup>2</sup> Fill material encountered in boreholes AAN-BH02 to AAN-BH05.			

### 6.2 Analytical results

Tabulated soil analytical results are provided in Attachment 4. Copies of laboratory certificates are provided in Attachment 6. Soil sampling locations are presented in Attachment 1. A summary of soil and leachate analytical results is included in the sections below.

#### 6.2.1 Soil

All analytical soil results for contaminants of potential concern were reported below the adopted assessment criteria, except for those summarised in Table 5.

Table 5 Summary of soil analytical exceedances

Area	Location	Depth (m bgl)	Soil Type	Nickel	Chromium (III+VI)	TRH C <sub>10</sub> -C <sub>36</sub>	(PFHxS)	(PFOS)	PFAS (Sum of Total)
Melbourne Airport PFAS Management Framework									0.01

Area	Location	Depth (m bgl)	Soil Type	Nickel	Chromium (III+VI)	TRH C <sub>10</sub> -C <sub>36</sub>	(PFHxS)	(PFOS)	PFAS (Sum of Total)
NEPM 2013 EIL-Commercial/Industrial				55					
Victoria Government Gazette, PFAS Designation (2022)							0.001	0.002	0.004
EPA Victoria Waste Disposal Guidelines 1828.2 (2021) - Fill Material				60		1000			
Airports (1997) soil - areas of environmental significance				60	50				
Package A	BH02	0.1	Fill	89	-	-	-	-	-
Package A	BH02	0.5	Fill	110	-	-	-	-	-
Package A	BH03	0.1	Fill	73	-	-	-	-	-
Package A	BH03	0.5	Natural	70	-	-	-	-	-
Package A	BH04	0.1	Fill	84	-	-	-	-	-
Package A	BH04	0.5	Natural	66	-	-	-	-	-
Package A	BH05	0.1	Fill	84	-	1090	-	-	-
Package B	BH02	0.3	Fill	-	82	-	-	-	-
		0.5		-	81	-	-	-	-
Package B	BH04	0.2	Natural	-	-	-	-	0.0044	0.0044
Package B	BH05	0.2	Natural	-	-	-	-	0.0041	0.0050
Package B	BH06	0.2	Natural	-	-	-	0.0013	0.0100	0.0113
Package B	BH06	0.5	Natural	85	-	-	-	-	-
Notes: TRH = Total recoverable hydrocarbons PFHxS = Perfluorohexane sulfonic acid PFOS = Perfluorooctane sulfonic acid									

## 6.2.2 Leachable fraction

All analytical leachable fraction<sup>1</sup> results for contaminants of potential concern were reported below the adopted health-based assessment criteria, except for those summarised in Table 6.

Table 6 Summary of leachate analytical exceedances

Area	Location	Depth (m bgl)	Soil Type	(PFOS)	Sum of PFHxS and PFOS (mg/kg)
PFAS NEMP 2.0 2020 Interim Landfill Unlined (leachable fraction)				0.07	0.07
Package B	BH06	0.2	Natural	0.14	0.17

<sup>1</sup> Leachable fraction measured using Australian Standard Leaching Procedure (ASLP), unbuffered.

Area	Location	Depth (m bgl)	Soil Type	(PFOS)	Sum of PFHxS and PFOS (mg/kg)
Notes: PFHxS = Perfluorohexane sulfonic acid PFOS = Perfluorooctane sulfonic acid					

## 7. Data validation

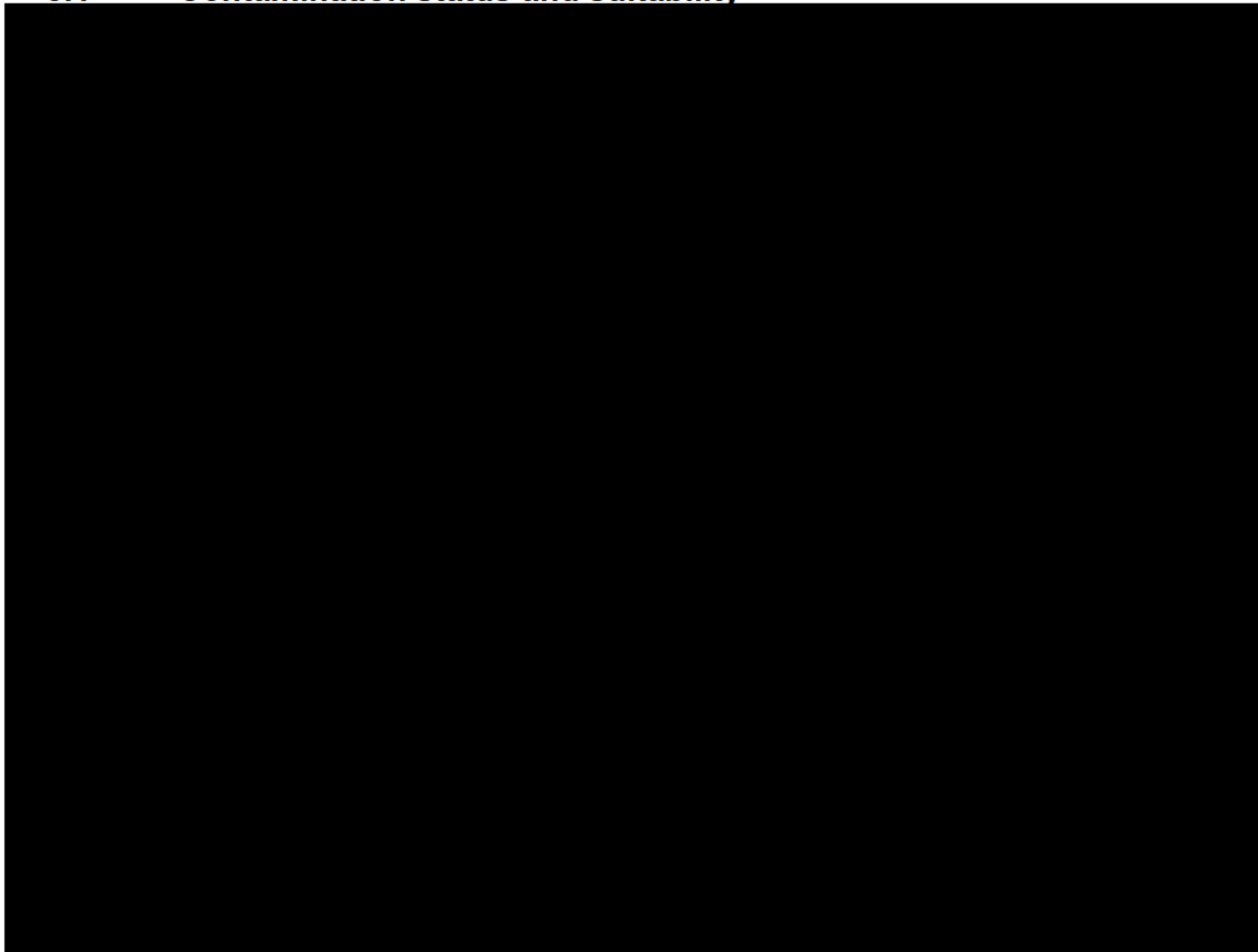
A data validation assessment was completed for all analytical sample data, to assess whether it is of suitable quality on which to base the site assessment. This included the collection and review of inter- and intra-laboratory duplicates, rinsate, and trip blank samples.

While some non-conformances were noted, namely duplicate frequency, the results of the data validation program were considered to provide an acceptable degree of confidence in the analytical program completed. Overall, the analytical data set was considered valid and acceptable for this report.

A copy of the detailed data validation report is provided in Attachment 5.

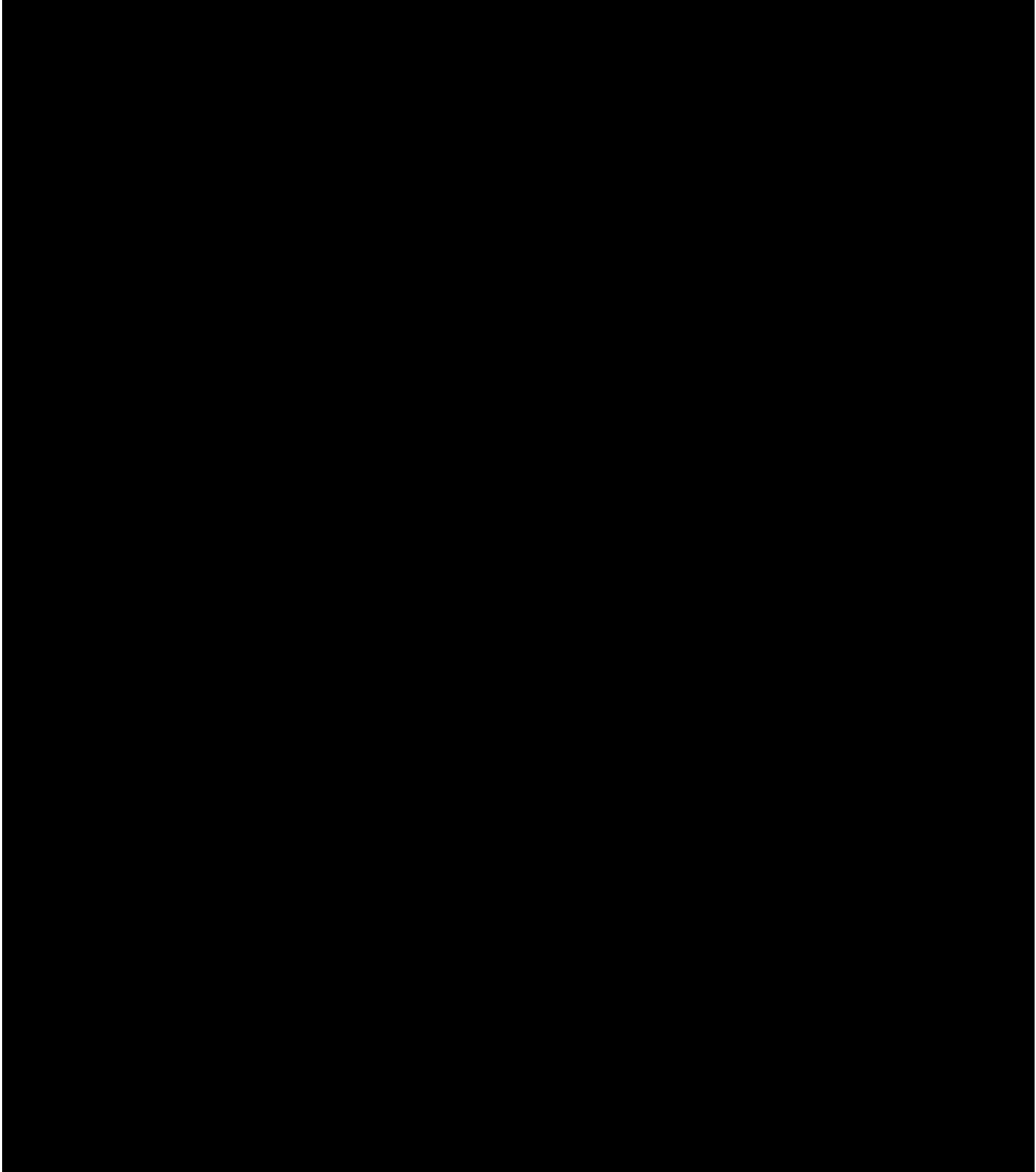
## 8. Discussion and conclusions

### 8.1 Contamination status and suitability

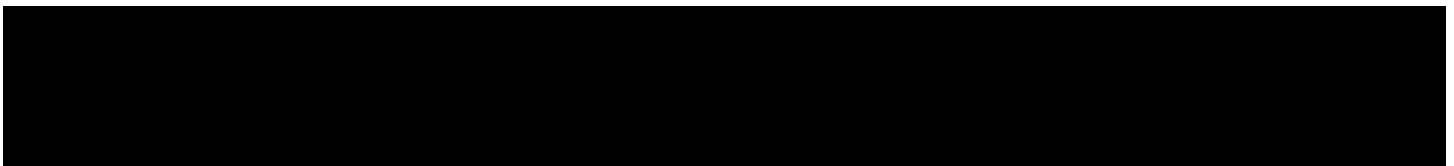


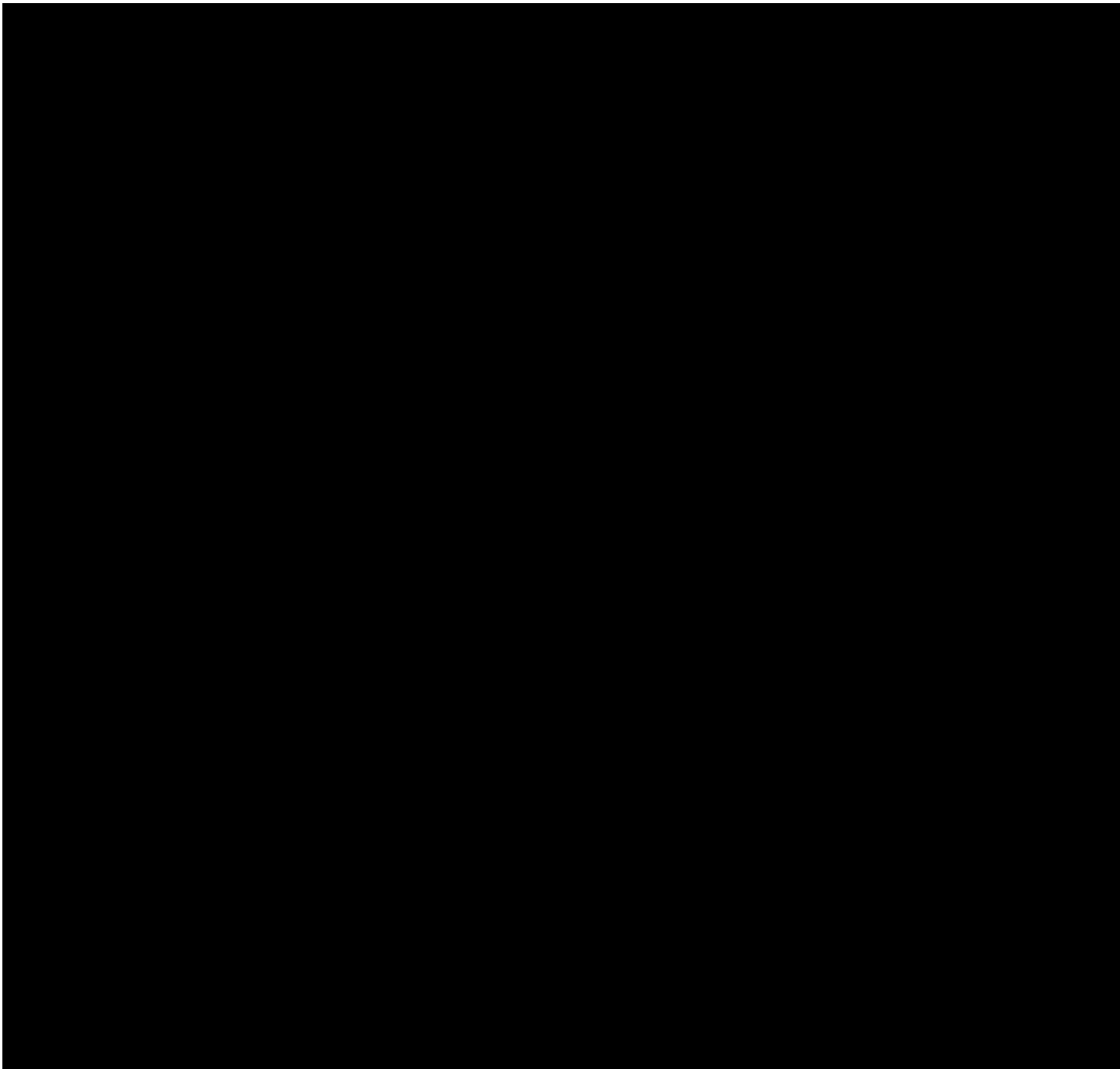


## 8.2 Indicative waste hazard categorisation



## 9. Recommendations





# Attachments

# Attachment 1

Figures



The first of these is the fact that the system is not a simple one. It is a complex system, and as such, it is not possible to understand it by looking at its parts in isolation. The system is a whole, and its behavior is determined by the interactions between its parts. This is a fundamental principle of systems thinking, and it is one that is often overlooked in traditional approaches to problem-solving.

The second of these is the fact that the system is dynamic. It is not a static system, and its behavior changes over time. This is another fundamental principle of systems thinking, and it is one that is often overlooked in traditional approaches to problem-solving.

The third of these is the fact that the system is open. It is not a closed system, and it interacts with its environment. This is another fundamental principle of systems thinking, and it is one that is often overlooked in traditional approaches to problem-solving.

The fourth of these is the fact that the system is self-organizing. It is not a system that is controlled from the outside, and it is not a system that is designed from the top down. It is a system that organizes itself from the bottom up, and it is a system that adapts to its environment. This is another fundamental principle of systems thinking, and it is one that is often overlooked in traditional approaches to problem-solving.

The fifth of these is the fact that the system is resilient. It is not a system that is fragile, and it is not a system that is easily disrupted. It is a system that is able to withstand change, and it is a system that is able to recover from setbacks. This is another fundamental principle of systems thinking, and it is one that is often overlooked in traditional approaches to problem-solving.

The sixth of these is the fact that the system is sustainable. It is not a system that is unsustainable, and it is not a system that is doomed to fail. It is a system that is able to continue to exist, and it is a system that is able to thrive. This is another fundamental principle of systems thinking, and it is one that is often overlooked in traditional approaches to problem-solving.

The seventh of these is the fact that the system is equitable. It is not a system that is unfair, and it is not a system that is biased. It is a system that is fair, and it is a system that is just. This is another fundamental principle of systems thinking, and it is one that is often overlooked in traditional approaches to problem-solving.

The eighth of these is the fact that the system is inclusive. It is not a system that is exclusive, and it is not a system that is discriminatory. It is a system that is open to all, and it is a system that is welcoming. This is another fundamental principle of systems thinking, and it is one that is often overlooked in traditional approaches to problem-solving.

The ninth of these is the fact that the system is transparent. It is not a system that is opaque, and it is not a system that is secretive. It is a system that is open, and it is a system that is honest. This is another fundamental principle of systems thinking, and it is one that is often overlooked in traditional approaches to problem-solving.

The tenth of these is the fact that the system is accountable. It is not a system that is irresponsible, and it is not a system that is unaccountable. It is a system that is responsible, and it is a system that is answerable. This is another fundamental principle of systems thinking, and it is one that is often overlooked in traditional approaches to problem-solving.

# **Attachment 2**

## **Calibration Certificate**



# **PID Calibration Certificate**

Instrument      PhoCheck Tiger  
Serial No.      T-115198



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	✓	10.6eV			
Alarms	Beeper	✓	Low	High	TWA	STEL
	Settings	✓	50ppm	100ppm	N/A	N/A
Software	Version	✓				
Data logger	Operation					
Download	Operation	✓				
Other tests:						

## **Certificate of Calibration**

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

Sensor	Serial no	Calibration gas and concentration	Certified	Gas bottle No		Instrument Reading
PID Lamp		95ppm Isobutylene	NIST	ME846		95.0 ppm

Calibrated by: [REDACTED]

Calibration date: 2/06/2023

Next calibration due: 29/11/2023

# Attachment 3

**Borelogs**

## BOREHOLE LOG SHEET

Client : APAM  
 Project : Apron Development  
 Location : Alpha Apron North Melbourne Airport

HOLE No. AAN-BH01

SHEET 1 OF 1

Position : [REDACTED] MGA94 55 Surface RL: 118.43m AHD Angle from Horiz. : -90° Processed : DF  
 Rig Type : MC-T7 Mounting: Truck Contractor : STAR Drilling Driller : [REDACTED] Checked :  
 Date Started : 25/5/2023 Date Completed : 25/5/2023 Logged by : D.H. Date :

Note: \* indicates signatures on original issue of log or last revision of log

DRILLING					MATERIAL									Note: * indicates signatures on original issue of log or last revision of log		
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	Description  SOIL TYPE, colour, structure, minor components (origin) and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	DCP Test Results  blows per 100mm		Recorded Blows	Comments/ Observations		
											20	40				
1	Hand Auger	Nil	GNE	3 x ES B(0.10m)	0.05 (118.48)		CI CH	TOPSOIL: CLAY trace sand; dark brown; fine grained sand; roots and rootlets	w<PL w~PL	F F			3	0.00: TOPSOIL; grass at surface 0.05: NEWER VOLCANICS		
							0.20 (118.63)				St				3	
							0.30 (118.73)				VSt				5	
							0.50 (118.93)					F-St				8
							0.80 (119.23)									8
							1.00 (119.43)			1.00m, becoming pale brown-grey calcified clay (Possibly EXTREMELY WEATHERED BASALT)	w<PL	St				5
																3
																1
																3
2	Solid Flight Auger			1 x ES	1.70 (120.13)			CLAY with sand; red-brown, fine to medium grained, sub-angular to sub-rounded sand of quartz (EXTREMELY WEATHERED BASALT)	w<PL	H			4	1.80: U63 refusal on hard soil		
															4	
															4	
															4	
															4	
															5	
															4	
															4	
															4	
															4	
3				U63 1.5-1.8m PP(1.8m) 3.5/4.8 /4.6 kg/cm²	3.00 (121.43)			End of Borehole at 3 metres. Auger Refusal. Borehole backfilled with spoil and sand to surface.						No odour in material encountered		
				1 x ES SPT (3.0m) 5 for 0mm												
4																

See standard sheets for  
 details of abbreviations  
 & basis of descriptions



Job No.

12605152

## BOREHOLE LOG SHEET



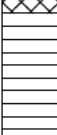
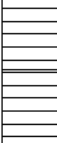
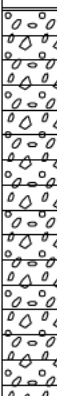
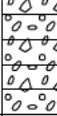
Client : APAM  
 Project : Apron Development  
 Location : Alpha Apron North Melbourne Airport

HOLE No. AAN-BH02

SHEET 1 OF 1

Position : XXXXXXXXXX MGA94 55 Surface RL: 115.42m AHD Angle from Horiz. : -90° Processed : DF  
 Rig Type : MC-T7 Mounting: Truck Contractor : STAR Drilling Driller : XXXXXXXXXX Checked :  
 Date Started : 25/5/2023 Date Completed : 25/5/2023 Logged by : D.H. Date :

Note: \* indicates signatures on original issue of log or last revision of log

DRILLING					MATERIAL							Note: * indicates signatures on original issue of log or last revision of log	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	Description SOIL TYPE, colour, structure, minor components (origin) and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	DCP Test Results blows per 100mm	Recorded Blows	Comments/ Observations
											20	40	
1	Solid Flight Auger	Nil	GNE	1 x ES			(GP)	FILL: Sandy GRAVEL; grey; fine to coarse grained, angular to sub-rounded sand; sub-angular to angular gravel of basalt	(D)	(VD)		24	0.00: FILL; ASPHALT 0.05: FILL; CRUSHED ROCK
				1 x ES	0.60 (116.02)		CH	CLAY trace sand and gravel; brown; fine to medium grained; sub-angular to sub-rounded sand; fine to medium, sub-angular gravel of basalt (Residual)	w = PL	VSt-H		0.60: NEWER VOLCANICS	
				1 x ES U63 1.0-1.23m PP (1.23m) 5/4.8/5.6 kg/cm² SPT (1.23m) 8/10/15 N=25	1.23 (116.65)		GP	Clayey GRAVEL; pale brown; fine to coarse, sub-angular to angular gravel of basalt (EXTREMELY WEATHERED BASALT)	D	VSt			
2				1 x ES									
3							SPT (3.0m) 3/22 for 150mm	3.15 (118.57)					
4								End of Borehole at 3.15 metres. Auger Refusal. Borehole backfilled with spoil and sand to surface and reinstated with cold mix.					
5													

See standard sheets for  
 details of abbreviations  
 & basis of descriptions



Job No.

12605152

## BOREHOLE LOG SHEET

Client : APAM  
 Project : Apron Development  
 Location : Alpha Apron North Melbourne Airport

HOLE No. AAN-BH03

SHEET 1 OF 1

Position : XXXXXXXXXX MGA94 55 Surface RL: 116.43m AHD Angle from Horiz. : -90° Processed : DF  
 Rig Type : MC-T7 Mounting: Truck Contractor : STAR Drilling Driller : XXXXXXXXXX Checked :  
 Date Started : 25/5/2023 Date Completed : 25/5/2023 Logged by : D.H Date :

Note: \* indicates signatures on original issue of log or last revision of log

DRILLING				MATERIAL				Comments/ Observations
SCALE (m)	Drilling Method	Hole Support Casing	Water	Samples & Tests	Depth (RL) metres	Graphic Log	USC Symbol	
								Description SOIL TYPE, colour, structure, minor components (origin) and ROCK TYPE, colour, grain size, structure, weathering, strength  Moisture Condition Consistency / Density Index  DCP Test Results blows per 100mm 20 40 Recorded Blows
1	Solid Flight Auger	Nil	GNE	1 x ES	0.10 (116.53)		(CI-CH) CH	FILL: Gravelly CLAY with sand; brown; fine to coarse grained, sub-angular to sub-rounded sand; fine to coarse, sub-angular gravel of basalt; rootlets  Gravelly CLAY trace sand; brown; fine grained sand; fine to medium, sub-angular gravel of basalt (Residual)  (w<PL) (Vst) w<PL Vst  F-St  St  Vst  H
				1 x ES	0.60 (117.03)			
				1 x ES U63	1.00 (117.43)		CI-CH	
				1.0-1.4m PP(1.4m) 3.6/4/4.6 kg/cm²	1.20 (117.63)			
				SPT (1.5m) 6/13/18 N=31	1.50 (117.93)			
2				1 x ES	1.80 (118.23)		CI-CH	
3				1 x ES SPT (3.0m) 5 for 30mm	3.50 (119.93)		SP	
4				Bulk sample collected	4.00 (120.43)			
5								

0.00: FILL; grass at surface  
 0.10: POSSIBLE NEWER VOLCANICS

1.50: SPT hammer double bouncing in 2nd and 3rd increments

3.00: SPT hammer double bouncing

No odour in material encountered

See standard sheets for details of abbreviations & basis of descriptions



Job No.

12605152

## BOREHOLE LOG SHEET


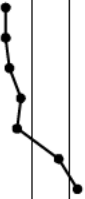




Client : APAM  
 Project : Apron Development  
 Location : Alpha Apron North Melbourne Airport

HOLE No. AAN-BH04

SHEET 1 OF 1

Position : XXXXXXXXXX MGA94 55 Surface RL: 115.69m AHD Angle from Horiz. : -90° Processed : DF  
 Rig Type : MC-T7 Mounting: Truck Contractor : STAR Drilling Driller : XXXXXXXXXX Checked :  
 Date Started : 25/5/2023 Date Completed : 25/5/2023 Logged by : D.H. Date :

Note: \* indicates signatures on original  
 issue of log or last revision of log

DRILLING					MATERIAL							Note: * indicates signatures on original issue of log or last revision of log		
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	Description SOIL TYPE, colour, structure, minor components (origin) and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	DCP Test Results blows per 100mm	Recorded Blows	Comments/ Observations	
1	Solid Flight Auger	Nil	GNE	1 x ES	0.20 (115.89)		(GP)	FILL: Sandy GRAVEL; grey-brown, fine to coarse grained, angular to sub-angular sand; fine to coarse, angular to sub-angular gravel Sandy GRAVEL; pale brown-grey; fine to coarse grained, sub-angular to sub-rounded sand; fine to medium, sub-angular gravel of basalt (EXTREMELY WEATHERED BASALT)	(D)	(MD-VD)		3 3 4 7 6 17 22	0.00: FILL	
				1 x ES	0.50 (116.19)		GP		D	L			0.20: NEWER VOLCANICS	
				1 x ES D(1.0m)	0.70 (116.39)				MD					
					0.80 (116.49)				D					
					1.70 (117.39)				VD					
2				SPT (1.5m) 10 for 50mm									No odour in material encountered	
				1 x ES										
3														
4														

See standard sheets for  
 details of abbreviations  
 & basis of descriptions



Job No.

12605152







## BOREHOLE LOG SHEET



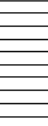
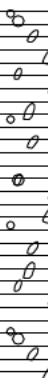

Client : APAM  
 Project : Apron Development  
 Location : Hotel Apron South Melbourne Airport

HOLE No. HAS-BH02

SHEET 1 OF 1

Position : XXXXXXXXXX MGA94 55 Surface RL: 110.07m AHD Angle from Horiz. : -90° Processed : DF  
 Rig Type : MC-T7 Mounting: Truck Contractor : STAR Drilling Driller : XXXXXXXXXX Checked :  
 Date Started : 6/6/2023 Date Completed : 6/6/2023 Logged by : D.H Date :

Note: \* indicates signatures on original issue of log or last revision of log

DRILLING				MATERIAL						DCP Test Results		Comments/ Observations			
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	Description SOIL TYPE, colour, structure, minor components (origin) and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	blows per 100mm		Recorded Blows		
											20	40			
1	Solid Flight Auger	Nil	GNE	1 x ES	0.05 (110.12)		- (SP)	FILL: BITUMEN	-	-			40	0.0: FILL - BITUMEN	
				1 x ES							(D)	(VD)			0.05: FLL - BASE COURSE
				1 x ES											
				1 x ES											
				SPT (1.5m) 6/4/6 N=10 B(1.5m)	1.50 (111.57)		CI	CLAY trace sand trace gravel; dark brown with white speckles; fine grained sand; fine to medium, sub-angular gravel of basalt (Residual)	w = PL	St					
2				1 x ES										1.30: NEWER VOLCANICS	
3				SPT (3.0m) 11/15/16 N=31 HB	2.50 (112.57)		CH	CLAY with gravel trace sand; pale brown with orange staining; fine to coarse grained, sub-angular to subrounded sand; fine to coarse, sub-angular gravel of basalt (EXTREMELY WEATHERED BASALT)	w < PL	H					
					3.80 (113.87)			End of Borehole at 3.8 metres. Auger Refusal. Borehole backfilled with spoil to surface and reinstated with cold mix.							
4															

See standard sheets for  
 details of abbreviations  
 & basis of descriptions



Job No.

12605152

## BOREHOLE LOG SHEET






Client : APAM  
 Project : Apron Development  
 Location : Hotel Apron South Melbourne Airport

HOLE No. HAS-BH03

SHEET 1 OF 1

Position : XXXXXXXXXX MGA94 55 Surface RL: 108.21m AHD Angle from Horiz. : -90° Processed : DF  
 Rig Type : MC-T7 Mounting: Truck Contractor : STAR Drilling Driller : XXXXXXXXXX Checked :  
 Date Started : 6/6/2023 Date Completed : 6/6/2023 Logged by : D.H Date :

Note: \* indicates signatures on original issue of log or last revision of log

DRILLING					MATERIAL					DCP		Comments/ Observations		
SCALE (m)	Drilling Method	Hole Support \\ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	Description SOIL TYPE, colour, structure, minor components (origin)and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	Test Results blows per 100mm		Recorded Blows	
											20	40		
1	Solid Flight Auger	Nil	GNE	1 x ES D(0.1m) 1 x ES	0.05 (108.26)		(GP)	FILL - ASPHALT FILL: Sandy GRAVEL; grey, fine to coarse grained sand; fine to coarse, sub-angular to angular gravel of basalt	(D)	(VD)			44 40	0.00: FILL - ASPHALT 0.05: FILL - BASE COURSE
				1 x ES D(0.9m) 1 x ES	0.70 (108.91)		(SP)	FILL: Gravelly SAND; grey fine to coarse grained, sub-angular to angular sand of basalt; fine to medium sub-angular to angular gravel of basalt						
				SPT (1.5m) 5/6/8 N=14 B(1.5m)	1.40 (109.61)		CI	Gravelly CLAY trace sand; brown; fine to medium grained sand; fine to coarse, sub-angular to angular gravel of basalt (Residual)	w<PL	St				1.40: NEWER VOLCANICS
				1 x ES										
3				SPT (3.0m) 4/21/27 N=48	3.45 (111.66)		SP	Clayey Gravelly SAND; brown; fine to coarse grained, sub-angular sand of basalt; fine to medium, sub-angular gravel of basalt (EXTREMELY WEATHERED BASALT)	D	VD				
					4.20 (112.41)			End of Borehole at 4.2 metres. Auger Refusal. Borehole backfilled with spoil to surface.						
4														
5														

See standard sheets for  
 details of abbreviations  
 & basis of descriptions



Job No.

12605152

## BOREHOLE LOG SHEET

Client : APAM  
 Project : Apron Development  
 Location : Hotel Apron South Melbourne Airport

HOLE No. HAS-BH04

SHEET 1 OF 1

Position : XXXXXXXXXX MGA94 55 Surface RL: 107.43m AHD Angle from Horiz. : -90° Processed : DF  
 Rig Type : MC-T7 Mounting: Truck Contractor : STAR Drilling Driller : XXXXXXXXXX Checked :  
 Date Started : 6/6/2023 Date Completed : 6/6/2023 Logged by : D.H Date :

Note: \* indicates signatures on original issue of log or last revision of log

DRILLING					MATERIAL							Note: * indicates signatures on original issue of log or last revision of log		
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	Description  SOIL TYPE, colour, structure, minor components (origin) and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	DCP Test Results blows per 100mm	Recorded Blows	Comments/ Observations	
											20	40		
1	Solid Flight Auger	Nil	GNE	1 x ES	0.05 (107.48)	▲▲▲▲	CH CH	TOPSOIL: CLAY trace sand and gravel; brown; fine to coarse grained, sub-angular to sub-rounded sand; fine to coarse, sub-angular to sub-rounded gravel of basalt	W=PL W<PL	(F-St) F-St			3	0.00: TOPSOIL 0.05: NEWER VOLCANICS
				1 x ES B(0.5m) D(0.5m)									3	
				1 x ES	0.90 (108.33)				Vst			2		
				SPT (1.5m) 1/2/6 N=8								3		
				1 x ES								5		
2								1.80m, becoming EXTREMELY WEATHERED BASALT						
					2.40 (109.83)			End of Borehole at 2.4 metres. Auger Refusal. Borehole backfilled with spoil to surface.						
3														
4														
5														

See standard sheets for details of abbreviations & basis of descriptions



Job No.

12605152

## BOREHOLE LOG SHEET

Client : APAM  
 Project : Apron Development  
 Location : Hotel Apron South Melbourne Airport

HOLE No. HAS-BH05

SHEET 1 OF 1

Position : XXXXXXXXXX MGA94 55 Surface RL: 107.30m AHD Angle from Horiz. : -90° Processed : DF  
 Rig Type : MC-T7 Mounting: Truck Contractor : STAR Drilling Driller : XXXXXXXXXX Checked :  
 Date Started : 6/6/2023 Date Completed : 6/6/2023 Logged by : D.H Date :

Note: \* indicates signatures on original issue of log or last revision of log

DRILLING					MATERIAL										Note: * indicates signatures on original issue of log or last revision of log
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	Description  SOIL TYPE, colour, structure, minor components (origin) and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	DCP Test Results  blows per 100mm		Recorded Blows	Comments/ Observations	
											20	40			
1	Solid Flight Auger	Nil	GNE	1 x ES	0.10 (107.40)		CH CH	TOPSOIL: CLAY with sand; dark brown; fine to medium grained, sub-angular to sub-rounded sand; rootlets  CLAY with sand; dark brown; fine to medium grained, sub-angular to sub-rounded sand (Residual)	W=PL W=PL	VS-S			1	0.0: TOPSOIL 0.10: NEWER VOLCANICS	
				1 x ES B(0.5m)	0.70 (108.00)								1		
				D(0.8m)	1.00 (108.30)				St				2		
				1 x ES	1.50 (108.80)				VSt				1		
				U63 1.5-1.86m PP (1.85m) 6+/6+/6+ kg/cm²	2.20 (109.50)				H				1		
2				1 x ES	3.60 (110.90)									4	
														6	
														6	
														8	
														9	
3				SPT (3.0m) 16/18 for 90mm HB			CI	CLAY with sand and gravel; brown; fine to medium grained, sub-angular to sub-rounded sand; fine to medium, sub-angular gravel of basalt (EXTREMELY WEATHERED BASALT)	W<PL				10		
													15		
													12		
4								End of Borehole at 3.6 metres. Auger Refusal. Borehole backfilled with spoil and sand to surface.							
5															

See standard sheets for  
 details of abbreviations  
 & basis of descriptions



Job No.

12605152



# **Attachment 4**

## **Analytical Results Tables**





































Attachment 4  
Table 3  
RPD Table

Melbourne Aiport  
Apron Development - Alpha Apron  
North Hotel Apron South Design Planning Services

Location Code Date Field ID Matrix Type Sample Type Lab Report Number	AAN-BH01		AAN-BH01		RPD	AAN-BH01		AAN-BH01		RPD
	25 May 2023		25 May 2023			25 May 2023		25 May 2023		
	AAN-BH01-0.1		AAN-QC01			AAN-BH01-0.1		AAN-QC02		
	Soil		Soil			Soil		Soil		
	Normal		Field_D			Normal		Interlab_D		
	EM2309440		EM2309440			EM2309440		1006796		
	Unit	EQL								
Leach Preparation										
pH of Leaching Fluid	pH units	0.1	-	-	-	-	5.9	-		
pH (Final)	pH units	0.1	-	-	-	-	8.5	-		
Misc.										
% Moisture	%	1	-	-	-	-	-	-		
Naphthalene (value used in F2 calc)	mg/kg	0.5	<1	<1	0	<1	-	-		
Inorganics										
Moisture (%)	%	1	23.3	23.8	2	23.3	-	-		
Metals										
Arsenic	mg/kg	2	<5	<5	0	<5	-	-		
Cadmium	mg/kg	0.4	<1	<1	0	<1	-	-		
Chromium (III+VI)	mg/kg	2	36	38	5	36	-	-		
Copper	mg/kg	5	14	15	7	14	-	-		
Lead	mg/kg	5	10	10	0	10	-	-		
Mercury	mg/kg	0.1	<0.1	<0.1	0	<0.1	-	-		
Nickel	mg/kg	2	30	33	10	30	-	-		
Zinc	mg/kg	5	16	15	6	16	-	-		
BTEXN										
Benzene	mg/kg	0.1	<0.2	<0.2	0	<0.2	-	-		
Toluene	mg/kg	0.1	<0.5	<0.5	0	<0.5	-	-		
Ethylbenzene	mg/kg	0.1	<0.5	<0.5	0	<0.5	-	-		
Xylene (o)	mg/kg	0.1	<0.5	<0.5	0	<0.5	-	-		
Xylene (m & p)	mg/kg	0.2	<0.5	<0.5	0	<0.5	-	-		
Xylene Total	mg/kg	0.3	<0.5	<0.5	0	<0.5	-	-		
BTEX (Sum of Total) - Lab Calc	mg/kg	0.2	<0.2	<0.2	0	<0.2	-	-		
Naphthalene	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-		
TRH - NEPM 2013										
F1 (C6-C10 minus BTEX)	mg/kg	10	<10	<10	0	<10	-	-		
C6-C10 Fraction	mg/kg	10	<10	<10	0	<10	-	-		
F2 (>C10-C16 minus Naphthalene)	mg/kg	50	<50	<50	0	<50	-	-		
>C10-C16 Fraction	mg/kg	50	<50	<50	0	<50	-	-		
F3 (>C16-C34 Fraction)	mg/kg	100	<100	<100	0	<100	-	-		
F4 (>C34-C40 Fraction)	mg/kg	100	<100	<100	0	<100	-	-		
>C10-C40 (Sum of Total)	mg/kg	50	<50	<50	0	<50	-	-		
TRH - NEPM 1999										
C6-C9 Fraction	mg/kg	10	<10	<10	0	<10	-	-		
C10-C14 Fraction	mg/kg	20	<50	<50	0	<50	-	-		
C15-C28 Fraction	mg/kg	50	<100	<100	0	<100	-	-		
C29-C36 Fraction	mg/kg	50	<100	<100	0	<100	-	-		
C10-C36 (Sum of Total)	mg/kg	50	<50	<50	0	<50	-	-		
PAHs - standard 16										
Acenaphthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-		
Acenaphthylene	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-		
Anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-		
Benz(a)anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-		
Benzo(a)pyrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-		
Benzo(b+j)fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-		
Benzo(k)fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-		
Benzo(g,h,i)perylene	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-		
Chrysene	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-		
Dibenz(a,h)anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-		
Fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-		
Fluorene	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-		
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-		
Phenanthrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-		
Pyrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-		
PAHs (Sum of total) - Lab calc	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-		
Total 8 PAHs (as BaP TEQ)(zero LOR) - Lab Calc	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-		
Total 8 PAHs (as BaP TEQ) (half LOR) - Lab Calc	mg/kg	0.5	0.6	0.6	0	0.6	-	-		
Total 8 PAHs (as BaP TEQ)(full LOR) - Lab Calc	mg/kg	0.5	1.2	1.2	0	1.2	-	-		
PFAS - Perfluoroalkyl Sulfonic Acids										
Perfluoropropanesulfonic acid (PFPrS)	mg/kg	0.005	-	-	-	-	-	-		
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	-	-		
	µg/L	0.02	-	-	-	-	-	-		
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	-	-		
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.0002	<0.0002	0.0002	0	<0.0002	-	-		
	µg/L	0.01	-	-	-	-	<0.01	-		
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	-	-		
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.0002	0.0016	0.0027	51	0.0016	-	-		
	µg/L	0.01	-	-	-	-	0.02	-		
Perfluorodecanesulfonic acid (PFDS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	-	-		
PFAS - Perfluoroalkyl Carboxylic Acids										
Perfluorobutanoic acid (PFBA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	-	-		
	µg/L	0.1	-	-	-	-	-	-		
Perfluoropentanoic acid (PFPeA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	-	-		
	µg/L	0.02	-	-	-	-	-	-		
Perfluorohexanoic acid (PFHxA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	-	-		
	µg/L	0.02	-	-	-	-	-	-		
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	-	-		
	µg/L	0.02	-	-	-	-	-	-		
Perfluorooctanoic acid (PFOA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	-	-		
	µg/L	0.01	-	-	-	-	<0.01	-		
Perfluorononanoic acid (PFNA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	-	-		
Perfluorodecanoic acid (PFDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	-	-		
Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	-	-		
Perfluorododecanoic acid (PFDoDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	-	-		
Perfluorotridecanoic acid (PFTTrDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	-	-		
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	-	-		
PFAS - Perfluoroalkyl Sulfonamide										



Attachment 4  
Table 3  
RPD Table

Melbourne Aiport  
Apron Development - Alpha Apron  
North Hotel Apron South Design Planning Services

Location Code Date Field ID Matrix Type Sample Type Lab Report Number			AAN-BH01	AAN-BH01	RPD	AAN-BH01	AAN-BH01	RPD
			25 May 2023	25 May 2023		25 May 2023	25 May 2023	
			AAN-BH01-0.1	AAN-QC01		AAN-BH01-0.1	AAN-QC02	
			Soil	Soil		Soil	Soil	
			Normal	Field_D		Normal	Interlab_D	
			EM2309440	EM2309440		EM2309440	1006796	
	Unit	EQL						
Perfluorooctane sulfonamide (FOSA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	-	-
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	-	-
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	-	-
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	-	-
N-Methyl perfluorooctane sulfonamidoethanol (MEFOSE)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	-	-
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	-	-
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	-	-
PFAS - Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	-	-
	µg/L	0.05	-	-	-	-	-	-
6:2 Fluorotelomer Sulfonate (6:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	-	-
	µg/L	0.05	-	-	-	-	<0.05	-
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	-	-
	µg/L	0.05	-	-	-	-	-	-
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	-	-
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05	-	-	-	-	-	-
PFAS - Sums								
Sum of PFHxS and PFOS	mg/kg	0.0002	0.0016	0.0029	58	0.0016	-	-
	µg/L	0.01	-	-	-	-	0.02	-
Sum of US EPA PFAS (PFOS + PFOA)*	mg/kg	0.005	-	-	-	-	-	-
	µg/L	0.01	-	-	-	-	0.02	-
PFAS (Sum of Total)	mg/kg	0.0002	0.0016	0.0029	58	0.0016	-	-
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	mg/kg	0.005	-	-	-	-	-	-
	µg/L	0.01	-	-	-	-	0.02	-
PFAS (Sum of Total)(WA DER List)	mg/kg	0.0002	0.0016	0.0029	58	0.0016	-	-
PFAS (Sum of Total)(WA DER List)	µg/L	0.01	-	-	-	-	-	-
PFAS								
Perfluorononane sulfonate (PFNS)	mg/kg	0.005	-	-	-	-	-	-

\*RPDs have only been considered where a concentration is greater than 1 times the EQL.  
\*\*Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 30 (1 - 10 x EQL); 30 (10 - 30 x EQL); 30 ( > 30 x E  
\*\*\*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 prim





Attachment 4  
Table 3  
RPD Table

Melbourne Aiport  
Apron Development - Alpha Apron  
North Hotel Apron South Design Planning Services

		AAN-BH01	AAN-BH01	RPD	AAN-BH01	AAN-BH01	RPD
		25 May 2023	25 May 2023		25 May 2023	25 May 2023	
		AAN-BH01-0.1	AAN-QC02		AAN-BH01-0.1	AAN-QC01	
		Soil	Soil		Soil	Soil	
		Normal	Interlab_D		Normal	Field_D	
		EM2309440	994260		EM2312534	EM2313141	
	Unit						
Leach Preparation							
pH of Leaching Fluid	pH units	-	-	-	-	-	-
pH (Final)	pH units	-	-	-	8.8	7.9	11
Misc.							
% Moisture	%	-	23	-	-	-	-
Naphthalene (value used in F2 calc)	mg/kg	<1	<0.5	0	-	-	-
Inorganics							
Moisture (%)	%	23.3	-	-	-	-	-
Metals							
Arsenic	mg/kg	<5	<2	0	-	-	-
Cadmium	mg/kg	<1	<0.4	0	-	-	-
Chromium (III+VI)	mg/kg	36	57	45	-	-	-
Copper	mg/kg	14	17	19	-	-	-
Lead	mg/kg	10	10	0	-	-	-
Mercury	mg/kg	<0.1	<0.1	0	-	-	-
Nickel	mg/kg	30	38	24	-	-	-
Zinc	mg/kg	16	24	40	-	-	-
BTEXN							
Benzene	mg/kg	<0.2	<0.1	0	-	-	-
Toluene	mg/kg	<0.5	<0.1	0	-	-	-
Ethylbenzene	mg/kg	<0.5	<0.1	0	-	-	-
Xylene (o)	mg/kg	<0.5	<0.1	0	-	-	-
Xylene (m & p)	mg/kg	<0.5	<0.2	0	-	-	-
Xylene Total	mg/kg	<0.5	<0.3	0	-	-	-
BTEX (Sum of Total) - Lab Calc	mg/kg	<0.2	-	-	-	-	-
Naphthalene	mg/kg	<0.5	<0.5	0	-	-	-
TRH - NEPM 2013							
F1 (C6-C10 minus BTEX)	mg/kg	<10	<20	0	-	-	-
C6-C10 Fraction	mg/kg	<10	<20	0	-	-	-
F2 (>C10-C16 minus Naphthalene)	mg/kg	<50	<50	0	-	-	-
>C10-C16 Fraction	mg/kg	<50	<50	0	-	-	-
F3 (>C16-C34 Fraction)	mg/kg	<100	<100	0	-	-	-
F4 (>C34-C40 Fraction)	mg/kg	<100	<100	0	-	-	-
>C10-C40 (Sum of Total)	mg/kg	<50	<100	0	-	-	-
TRH - NEPM 1999							
C6-C9 Fraction	mg/kg	<10	<20	0	-	-	-
C10-C14 Fraction	mg/kg	<50	<20	0	-	-	-
C15-C28 Fraction	mg/kg	<100	<50	0	-	-	-
C29-C36 Fraction	mg/kg	<100	<50	0	-	-	-
C10-C36 (Sum of Total)	mg/kg	<50	<50	0	-	-	-
PAHs - standard 16							
Acenaphthene	mg/kg	<0.5	<0.5	0	-	-	-
Acenaphthylene	mg/kg	<0.5	<0.5	0	-	-	-
Anthracene	mg/kg	<0.5	<0.5	0	-	-	-
Benz(a)anthracene	mg/kg	<0.5	<0.5	0	-	-	-
Benzo(a)pyrene	mg/kg	<0.5	<0.5	0	-	-	-
Benzo(b+j)fluoranthene	mg/kg	<0.5	<0.5	0	-	-	-
Benzo(k)fluoranthene	mg/kg	<0.5	<0.5	0	-	-	-
Benzo(g,h,i)perylene	mg/kg	<0.5	<0.5	0	-	-	-
Chrysene	mg/kg	<0.5	<0.5	0	-	-	-
Dibenz(a,h)anthracene	mg/kg	<0.5	<0.5	0	-	-	-
Fluoranthene	mg/kg	<0.5	<0.5	0	-	-	-
Fluorene	mg/kg	<0.5	<0.5	0	-	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.5	<0.5	0	-	-	-
Phenanthrene	mg/kg	<0.5	<0.5	0	-	-	-
Pyrene	mg/kg	<0.5	<0.5	0	-	-	-
PAHs (Sum of total) - Lab calc	mg/kg	<0.5	<0.5	0	-	-	-
Total 8 PAHs (as BaP TEQ)(zero LOR) - Lab Calc	mg/kg	<0.5	<0.5	0	-	-	-
Total 8 PAHs (as BaP TEQ) (half LOR) - Lab Calc	mg/kg	0.6	0.6	0	-	-	-
Total 8 PAHs (as BaP TEQ)(full LOR) - Lab Calc	mg/kg	1.2	1.2	0	-	-	-
PFAS - Perfluoroalkyl Sulfonic Acids							
Perfluoropropanesulfonic acid (PFPrS)	mg/kg	-	<0.005	-	-	-	-
Perfluorobutane sulfonic acid (PFBS)	mg/kg	<0.0002	<0.005	0	-	-	-
	µg/L	-	-	-	<0.02	<0.02	0
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	<0.0002	<0.005	0	-	-	-
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	<0.0002	<0.005	0	-	-	-
	µg/L	-	-	-	<0.01	<0.01	0
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	<0.0002	<0.005	0	-	-	-
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.0016	<0.005	0	-	-	-
	µg/L	-	-	-	0.02	0.02	0
Perfluorodecanesulfonic acid (PFDS)	mg/kg	<0.0002	<0.005	0	-	-	-
PFAS - Perfluoroalkyl Carboxylic Acids							
Perfluorobutanoic acid (PFBA)	mg/kg	<0.001	<0.005	0	-	-	-
	µg/L	-	-	-	<0.1	<0.1	0
Perfluoropentanoic acid (PFPeA)	mg/kg	<0.0002	<0.005	0	-	-	-
	µg/L	-	-	-	<0.02	<0.02	0
Perfluorohexanoic acid (PFHxA)	mg/kg	<0.0002	<0.005	0	-	-	-
	µg/L	-	-	-	<0.02	<0.02	0
Perfluoroheptanoic acid (PFHpA)	mg/kg	<0.0002	<0.005	0	-	-	-
	µg/L	-	-	-	<0.02	<0.02	0
Perfluorooctanoic acid (PFOA)	mg/kg	<0.0002	<0.005	0	-	-	-
	µg/L	-	-	-	<0.01	<0.01	0
Perfluorononanoic acid (PFNA)	mg/kg	<0.0002	<0.005	0	-	-	-
Perfluorodecanoic acid (PFDA)	mg/kg	<0.0002	<0.005	0	-	-	-
Perfluoroundecanoic acid (PFUnDA)	mg/kg	<0.0002	<0.005	0	-	-	-
Perfluorododecanoic acid (PFDoDA)	mg/kg	<0.0002	<0.005	0	-	-	-
Perfluorotridecanoic acid (PFTTrDA)	mg/kg	<0.0002	<0.005	0	-	-	-
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	<0.0005	<0.005	0	-	-	-
PFAS - Perfluoroalkyl Sulfonamide							



Attachment 4  
Table 3  
RPD Table

Melbourne Aiport  
Apron Development - Alpha Apron  
North Hotel Apron South Design Planning Services

		AAN-BH01	AAN-BH01	RPD	AAN-BH01	AAN-BH01	RPD
		25 May 2023	25 May 2023		25 May 2023	25 May 2023	
		AAN-BH01-0.1	AAN-QC02		AAN-BH01-0.1	AAN-QC01	
		Soil	Soil		Soil	Soil	
		Normal	Interlab_D		Normal	Field_D	
		EM2309440	994260		EM2312534	EM2313141	
	Unit						
Perfluorooctane sulfonamide (FOSA)	mg/kg	<0.0002	<0.005	0	-	-	-
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	<0.0005	<0.005	0	-	-	-
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	<0.0005	<0.005	0	-	-	-
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	mg/kg	<0.0002	<0.01	0	-	-	-
N-Methyl perfluorooctane sulfonamidoethanol (MEFOSE)	mg/kg	<0.0005	<0.005	0	-	-	-
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	<0.0005	<0.005	0	-	-	-
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	<0.0002	<0.01	0	-	-	-
PFAS - Fluorotelomer Sulfonic Acids							
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	<0.0005	<0.005	0	-	-	-
	µg/L	-	-	-	<0.05	<0.05	0
6:2 Fluorotelomer Sulfonate (6:2 FTS)	mg/kg	<0.0005	<0.01	0	-	-	-
	µg/L	-	-	-	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	<0.0005	<0.005	0	-	-	-
	µg/L	-	-	-	<0.05	<0.05	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	<0.0005	<0.005	0	-	-	-
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	-	-	-	<0.05	<0.05	0
PFAS - Sums							
Sum of PFHxS and PFOS	mg/kg	0.0016	<0.005	0	-	-	-
	µg/L	-	-	-	0.02	0.02	0
Sum of US EPA PFAS (PFOS + PFOA)*	mg/kg	-	<0.005	-	-	-	-
	µg/L	-	-	-	-	-	-
PFAS (Sum of Total)	mg/kg	0.0016	<0.05	0	-	-	-
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	mg/kg	-	<0.005	-	-	-	-
	µg/L	-	-	-	-	-	-
PFAS (Sum of Total)(WA DER List)	mg/kg	0.0016	<0.01	0	-	-	-
PFAS (Sum of Total)(WA DER List)	µg/L	-	-	-	0.02	0.02	0
PFAS							
Perfluorononane sulfonate (PFNS)	mg/kg	-	<0.005	-	-	-	-

\*RPDs have only been considered where a conc  
\*\*Elevated RPDs are highlighted as per QAQC PQL )  
\*\*\*Interlab Duplicates are matched on a per comjary laboratory



**Attachment 4**  
**Table 5**  
**Rinsate Results**

Melbourne Airport  
Apron Development - Alpha Apron North  
Hotel Apron South Design Planning Services

		Location Code			
		Date			
		Field ID			
		Lab Report Number			
		25 May 2023		06 Jun 2023	
		RB01		RS01	
		EM2309440		EM2310246	
	Unit	EQL			
Misc.					
Naphthalene (value used in F2 calc)	mg/L	0.005	<0.005	<0.005	
Metals					
Arsenic	mg/L	0.001	<0.001	<0.001	
Cadmium	mg/L	0.0001	<0.0001	<0.0001	
Chromium (III+VI)	mg/L	0.001	<0.001	<0.001	
Copper	mg/L	0.001	<0.001	<0.001	
Lead	mg/L	0.001	<0.001	<0.001	
Mercury	mg/L	0.0001	<0.0001	<0.0001	
Nickel	mg/L	0.001	<0.001	<0.001	
Zinc	mg/L	0.005	<0.005	<0.005	
BTEXN					
Benzene	µg/L	1	<1	<1	
Toluene	µg/L	2	<2	<2	
Ethylbenzene	µg/L	2	<2	<2	
Xylene (o)	µg/L	2	<2	<2	
Xylene (m & p)	µg/L	2	<2	<2	
Xylene Total	µg/L	2	<2	<2	
BTEX (Sum of Total) - Lab Calc	µg/L	1	<1	<1	
Naphthalene	µg/L	1	<1.0	<1.0	
TRH - NEPM 2013					
F1 (C6-C10 minus BTEX)	µg/L	20	<20	<20	
C6-C10 Fraction	µg/L	20	<20	<20	
F2 (>C10-C16 minus Naphthalene)	µg/L	100	<100	<100	
>C10-C16 Fraction	µg/L	100	<100	<100	
F3 (>C16-C34 Fraction)	µg/L	100	<100	<100	
F4 (>C34-C40 Fraction)	µg/L	100	<100	<100	
>C10-C40 (Sum of Total)	µg/L	100	<100	<100	
TRH - NEPM 1999					
C6-C9 Fraction	µg/L	20	<20	<20	
C10-C14 Fraction	µg/L	50	<50	<50	
C15-C28 Fraction	µg/L	100	<100	<100	
C29-C36 Fraction	µg/L	50	<50	<50	
C10-C36 (Sum of Total)	µg/L	50	<50	<50	
PAHs - standard 16					
Acenaphthene	µg/L	1	<1.0	<1.0	
Acenaphthylene	µg/L	1	<1.0	<1.0	
Anthracene	µg/L	1	<1.0	<1.0	
Benz(a)anthracene	µg/L	1	<1.0	<1.0	
Benzo(a)pyrene	µg/L	0.5	<0.5	<0.5	
Benzo[b+j]fluoranthene	µg/L	1	<1.0	<1.0	
Benzo(k)fluoranthene	µg/L	1	<1.0	<1.0	
Benzo(g,h,i)perylene	µg/L	1	<1.0	<1.0	
Chrysene	µg/L	1	<1.0	<1.0	
Dibenz(a,h)anthracene	µg/L	1	<1.0	<1.0	
Fluoranthene	µg/L	1	<1.0	<1.0	
Fluorene	µg/L	1	<1.0	<1.0	
Indeno(1,2,3-c,d)pyrene	µg/L	1	<1.0	<1.0	
Phenanthrene	µg/L	1	<1.0	<1.0	
Pyrene	µg/L	1	<1.0	<1.0	
PAHs (Sum of total) - Lab calc	µg/L	0.5	<0.5	<0.5	
Total 8 PAHs (as BaP TEQ)(zero LOR) - Lab Calc	µg/L	0.5	<0.5	<0.5	
Phenols - Halogenated					
2-Chlorophenol	µg/L	1	<1.0	-	
2,4-Dichlorophenol	µg/L	1	<1.0	-	
2,4,5-Trichlorophenol	µg/L	1	<1.0	-	
2,4,6-Trichlorophenol	µg/L	1	<1.0	-	
2,6-Dichlorophenol	µg/L	1	<1.0	-	
4-Chloro-3-methylphenol	µg/L	1	<1.0	-	
Pentachlorophenol	µg/L	2	<2.0	-	
Phenols - Non-Halogenated					
Phenol	µg/L	1	<1.0	-	
2-Nitrophenol	µg/L	1	<1.0	-	
2-Methylphenol (o-Cresol)	µg/L	1	<1.0	-	
3,4-Methylphenol (m,p-cresol)	µg/L	2	<2.0	-	
2,4-Dimethylphenol	µg/L	1	<1.0	-	

**Statistics**

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



Attachment 4  
Table 6  
Trip Blank Results

Melbourne Aiport  
Apron Development - Alpha Apron  
North Hotel Apron South Design Planning Services

Lab Report Number	Unit	EQL	Date	25 May 2023	25 May 2023	06 Jun 2023	06 Jun 2023
			Matrix Type	Water	Water	Water	Water
				EM2309440	EM2309440	EM2310246	EM2310246
Misc.							
Naphthalene (value used in F2 calc)	mg/L	0.005		<0.005	<0.005	<0.005	<0.005
Metals							
Arsenic	mg/L	0.001		<0.001	-	<0.001	-
Cadmium	mg/L	0.0001		<0.0001	-	<0.0001	-
Chromium (III+VI)	mg/L	0.001		<0.001	-	<0.001	-
Copper	mg/L	0.001		<0.001	-	<0.001	-
Lead	mg/L	0.001		<0.001	-	<0.001	-
Mercury	mg/L	0.0001		<0.0001	-	<0.0001	-
Nickel	mg/L	0.001		<0.001	-	<0.001	-
Zinc	mg/L	0.005		<0.005	-	<0.005	-
BTEXN							
Benzene	µg/L	1		<1	<1	<1	<1
Toluene	µg/L	2		<2	<2	<2	<2
Ethylbenzene	µg/L	2		<2	<2	<2	<2
Xylene (o)	µg/L	2		<2	<2	<2	<2
Xylene (m & p)	µg/L	2		<2	<2	<2	<2
Xylene Total	µg/L	2		<2	<2	<2	<2
BTEX (Sum of Total) - Lab Calc	µg/L	1		<1	<1	<1	<1
Naphthalene	µg/L	1		<1.0	-	<1.0	-
TRH - NEPM 2013							
F1 (C6-C10 minus BTEX)	µg/L	20		<20	<20	<20	<20
C6-C10 Fraction	µg/L	20		<20	<20	<20	<20
F2 (>C10-C16 minus Naphthalene)	µg/L	100		<100	-	<100	-
>C10-C16 Fraction	µg/L	100		<100	-	<100	-
F3 (>C16-C34 Fraction)	µg/L	100		<100	-	<100	-
F4 (>C34-C40 Fraction)	µg/L	100		<100	-	<100	-
>C10-C40 (Sum of Total)	µg/L	100		<100	-	<100	-
TRH - NEPM 1999							
C6-C9 Fraction	µg/L	20		<20	<20	<20	<20
C10-C14 Fraction	µg/L	50		<50	-	<50	-
C15-C28 Fraction	µg/L	100		<100	-	<100	-
C29-C36 Fraction	µg/L	50		<50	-	<50	-
C10-C36 (Sum of Total)	µg/L	50		<50	-	<50	-
PAHs - standard 16							
Acenaphthene	µg/L	1		<1.0	-	<1.0	-
Acenaphthylene	µg/L	1		<1.0	-	<1.0	-
Anthracene	µg/L	1		<1.0	-	<1.0	-
Benz(a)anthracene	µg/L	1		<1.0	-	<1.0	-
Benzo(a)pyrene	µg/L	0.5		<0.5	-	<0.5	-
Benzo[b+j]fluoranthene	µg/L	1		<1.0	-	<1.0	-
Benzo(k)fluoranthene	µg/L	1		<1.0	-	<1.0	-
Benzo(g,h,i)perylene	µg/L	1		<1.0	-	<1.0	-
Chrysene	µg/L	1		<1.0	-	<1.0	-
Dibenz(a,h)anthracene	µg/L	1		<1.0	-	<1.0	-
Fluoranthene	µg/L	1		<1.0	-	<1.0	-
Fluorene	µg/L	1		<1.0	-	<1.0	-
Indeno(1,2,3-c,d)pyrene	µg/L	1		<1.0	-	<1.0	-
Phenanthrene	µg/L	1		<1.0	-	<1.0	-
Pyrene	µg/L	1		<1.0	-	<1.0	-
PAHs (Sum of total) - Lab calc	µg/L	0.5		<0.5	-	<0.5	-
Total 8 PAHs (as BaP TEQ)(zero LOR) - Lab Calc	µg/L	0.5		<0.5	-	<0.5	-
Phenols - Halogenated							
2-Chlorophenol	µg/L	1		<1.0	-	-	-
2,4-Dichlorophenol	µg/L	1		<1.0	-	-	-
2,4,5-Trichlorophenol	µg/L	1		<1.0	-	-	-
2,4,6-Trichlorophenol	µg/L	1		<1.0	-	-	-
2,6-Dichlorophenol	µg/L	1		<1.0	-	-	-
4-Chloro-3-methylphenol	µg/L	1		<1.0	-	-	-
Pentachlorophenol	µg/L	2		<2.0	-	-	-
Phenols - Non-Halogenated							
Phenol	µg/L	1		<1.0	-	-	-
2-Nitrophenol	µg/L	1		<1.0	-	-	-
2-Methylphenol (o-Cresol)	µg/L	1		<1.0	-	-	-
3,4-Methylphenol (m,p-cresol)	µg/L	2		<2.0	-	-	-
2,4-Dimethylphenol	µg/L	1		<1.0	-	-	-

# Attachment 5

Data Validation

# Quality Assurance and Quality Control Report

## Introduction

Established quality assurance/quality control (QA/QC) procedures to assess data quality were maintained throughout the project. The QA/QC program undertaken as part of the assessment by GHD included the following:

- Use of appropriately qualified and trained staff;
- Calibration of field instruments;
- Preservation of samples with ice during transport from the field to the laboratory;
- Transportation of samples with accompanying chain-of-custody documentation;
- Compliance with sample holding times where possible;
- Review of results of blind duplicate samples;
- Review of results of split duplicate samples;
- Review of results of rinsate and trip blank samples; and
- Review of internal analysis of laboratory duplicates, spikes and blanks.

The QC program employed during this investigation was in accordance with the general requirements set out in the National Environment Protection (Assessment of Site Contamination) Measure (NEPM) 1999 (amended 2013). QC samples provide information that discounts or potentially identifies errors due to possible sources of cross contamination, inconsistencies in sampling and analytical techniques used. The QC program completed included the collection and analysis of duplicate, rinsate blank and trip blank samples, these are described below:

- **Inter-laboratory duplicate samples:** These are inter-laboratory duplicate samples split in the field, with one sample being sent to a secondary laboratory for analysis. The same parameters are analysed utilising similar analytical techniques and results are compared to primary laboratory results;
- **Intra-laboratory duplicate samples:** These are intra-laboratory duplicate samples split in the field with both samples submitted to the primary laboratory for analysis as individual samples without any indication to the laboratory that they have been duplicated. The same parameters are analysed and results are compared;
- **Rinsate blank:** A sample of deionised water collected from equipment used during sampling to indicate whether cross contamination occurred from equipment.; and
- **Trip blank samples:** A blank sample placed into the ice chest to indicate whether cross contamination has occurred during transport.

Intra- and inter-laboratory sample results were assessed using calculated relative percentage difference (RPD) values. The RPD values were calculated using the following equation.

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

Where Co = concentration obtained from the original sample

Cs = concentration obtained from the duplicate/XRF QAQC sample

## GHD QA/QC: Soil Assessment

### Sample batches

Sample batches issued during soil investigation works are summarised in Table 1.

Table 1 Soil lab report summary

Laboratory	Primary/Secondary	Report number
ALS	Primary	EM2309440
		EM2310246
		EM2312534
		EM2313141
Eurofins	Secondary	994260
		1006796

### Soil field duplicate and interlaboratory duplicate frequency

The combined frequency of primary and quality control samples collected during the soil investigation sampling program is summarised in Table 2.

Table 2 Frequency of soil sample duplicates

Sample type	Number of samples analysed	Sample frequency
Primary samples	22	-
Intralaboratory (field) duplicates	1	4.5%
Interlaboratory (split) duplicates	1	4.5%

For soil sampling, this frequency is slightly below compliance with the frequency of 5% outlined in NEPM 1999 (amended 2013) due to additional pavement samples analysed later in the project. The frequency is also below the 10% required for PFAS samples, per the NEMP 2.0, 2020 due to an error during analysis requests.

### Soil RPD results

Comparison of concentrations between the quality control sample pairs indicated general conformance with the adopted RPD acceptability limit of 30% for concentrations greater than 10x the LOR. RPD exceedances are summarised in Table 3. The full set of RPD results is presented in Table 4 of Attachment 4, in the main report.

Table 3 Summary of soil RPD exceedances

Laboratory Sample ID Pair (Primary Sample / Duplicate)	Analyte	RPD %
AAN-BH01-0.1 AAN-QC01	Perfluorooctane sulfonic acid (PFOS)	51
	Sum of PFHxS and PFOS	58
	PFAS (Sum of Total)	58
AAN-BH01-0.1 AAN-QC02	Chromium	45
	Zinc	40

Given that the majority of RPD exceedances reported concentrations within the same order of magnitude as the primary and other duplicate pair and all results did not result in any additional exceedances of the adopted assessment criteria it can be reasoned that the RPD exceedances are unlikely to impact the integrity of the data set.



## Rinsate Samples

Rinsate samples were collected as part of the sampling program and were analysed for 8 metals, TRH, BTEXN, PAH and PFAS Full Suite (28) Analytes). No defects were reported. Rinsate blank results are presented in Table 5 of Attachment 4, in the main report.

## Trip blank samples

Two trip blank samples were collected as part of the soil sampling program and were analysed for BTEXN/TRH (C6-C10 Fraction) hydrocarbons. All reported results were below the laboratory limit of reporting (LOR). Trip blank results are presented in Table 6 of Attachment 4, in the main report.

## Laboratory QAQC

### Compliance with recommended holding times

All analytes exceeded Eurofins' and/or ALS' technical holding times are summarised in Table 4Table 1.

Table 4 Technical holding time exceedances

Matrix	Laboratory Report	Sample ID	Analyte	Days overdue for Extraction	Days Overdue for Analysis
Soil	EM2313141	AAN-BH02-0.1 AAN-BH02-0.5	Total Recoverable Mercury by FIMS	29	32

Holding time exceedances were considered to be minor given the majority of the dataset was analysed within the specified holding time.

### Laboratory duplicates

No laboratory duplicate RPD exceedances were reported.

### Matrix spike non-compliances

Non-compliances for the matrix spike analysis conducted by Eurofins and ALS are summarised in Table 5:

Table 5 Matrix spike non-compliances

Matrix	Laboratory Report	Analyte	Laboratory Sample ID	Comment
Soil	EM2309440	Hexavalent Chromium	EM2309251--011	Recovery less than lower data quality objective
		Perfluoroalkyl Sulfonic Acids	EM2309416--001	MS recovery not determined, background level greater than or equal to 4x spike level.
		Perfluoroalkyl Carboxylic Acids	EM2309416--001	MS recovery not determined, background level greater than or equal to 4x spike level. Recovery less than lower data quality objective.
		Perfluoroalkyl Sulfonamides	EM2309416--001	MS recovery not determined, background level greater than or equal to 4x spike level. Recovery less than lower data quality objective.
		Fluorotelomer Sulfonic Acids	EM2309416--001	MS recovery not determined, background level greater than or equal to 4x spike level.



Matrix	Laboratory Report	Analyte	Laboratory Sample ID	Comment
Leachate	EM2310246	Cyanide Amenable to Chlorination	EM2310246--021	Recovery greater than upper data quality objective.
	EM2310246	Perfluoroalkyl Sulfonamides	EM2310184--003	Recovery less than lower data quality objective
	EM2310246	Fluorotelomer Sulfonic Acids	EM2310184--003	Recovery less than lower data quality objective
Leachate	EM2312534	Fluorotelomer Sulfonic Acids	EM2312534--002	Recovery less than lower data quality objective
	EM2313141	Fluorotelomer Sulfonic Acids	EM2313076--002	Recovery less than lower data quality objective
	EM2313141	Fluorotelomer Sulfonic Acids	EM2313076--002	Recovery less than lower data quality objective

While matrix spike recoveries were reported outside the acceptable limits, the integrity of the overall data set was not considered to be impacted given the majority of non-conformances related to matrix interference and we were associated with other lab reports (not related to the site).

## Method blanks

All reported concentrations for laboratory method blanks analysed by Eurofins and ALS were below the respective laboratory LOR.

## Laboratory control sample (LCS) spike recoveries

The primary and secondary labs conducted and measured all LCS spike percentage recoveries within their specified acceptability ranges, there were no outliers for either laboratory.

## Laboratory control sample frequency non-compliances

Laboratory control sample frequency non-compliances were reported and are summarised in Table 6.

*Table 6 Laboratory Control sample frequency non-compliances*

Matrix	Laboratory Report	Method	Rate (%)		Quality Control Specification
			Actual	Expected	
Soil	EM2309440	TRH - Semi volatile Fraction	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Soil	EM2310246	TRH - Semi volatile Fraction	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Soil	EM2313141	Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

## Discussion

While some non-conformances were noted, namely duplicate frequency, the results of the data validation program were considered to provide an acceptable degree of confidence in the analytical program completed. Overall, the analytical data set was considered valid and acceptable for the purposes of this report.

# **Attachment 6**

**Laboratory Certificates of Analysis**

# SAMPLES RECEIVED WITHOUT COC

CLIENT: <b>GH</b>	CARRIER: <b>Conner</b>
PROJECT / QUOTE: <b>12605152</b>	CONNOTE #:
CONTACT NAME:	AWB #:
CONTACT NUMBER:	# OF ESKIES: <b>3</b> SECURITY SEAL: Y <b>N</b> N/A
SAMPLER NAME:	TYPE OF ESKIES: <b>HAD</b>
SAMPLER NUMBER: <b>AL</b>	ESKY NUMBERS: <b>Soils</b>
SAMPLES RECEIVED BY: <b>Moun Chan</b>	# OF SAMPLES:
DATE/TIME RECEIVED: <b>26/5 10:15</b>	TEMPERATURE:
CLIENT SERVICES NOTIFIED BY:	

Environmental Division  
Melbourne  
Work Order Reference  
**EM2309440**



Telephone : +61-3-8649 9800

LAB ID	SAMPLE DETAILS			NUMBER OF CONTAINERS	ADDITIONAL INFORMATION / COMMENTS:
	SAMPLE ID	DATE	MATRIX		OTHER INFORMATION:
1	AAN-BH02-1.0	25/5	S		<input type="checkbox"/> MICRO <input type="checkbox"/> BIOSECURITY <input type="checkbox"/> BROKEN CONTAINERS <input type="checkbox"/> COC EMAILED <input type="checkbox"/> ALS COMPASS
2	AAN-BH03-0.5	25/5	S		
3	TB01	25/5	W		
4	etc				
5					
TOTAL					

CORRESPONDENCE (DATE, INITIALS - DETAILS OF CORRESPONDENCE):



CHAIN OF CUSTODY RECORD  
GHD Pty Ltd

GHD Melbourne Office Address  
1180 Lonsdale Street Melbourne 3000  
Telephone: 613 8668 8000  
Fax: 613 8667 8111

Completion Date / Turnaround

Comments

Page: 1 of 1

Project Number 12000152		Laboratory		Comments and Laboratory Instructions										
Project Name AP/PAU Agrost Development		Laboratory Address		-Sign chain of custody documents on receipt and each sample										
GHD Project Manager GHD Contract		Laboratory Contact		-The chain of custody documents should be forwarded to the laboratory address shown										
GHD PUA email				-Laboratory contact should sign the COC and send a Project Manager and GHD Contract, along with a sample										
GHD Contract email				-The chain of custody documents should be forwarded to the laboratory address shown										
Sample ID.		Date	Sample Matrix B: Soil, SL: Sludge W: water, A: Air OW: Groundwater	Preservative	Type A: soil jar V: soil G: glass bottle P: plastic bottle	Number	Volume (ml)	EP231X: PFAS (28 analytes)	S-26: TRH, BTEXN, PAH, Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg)	W-18: TRH (C4-C10) / BTEXN	W-27: (TRH (C6-C40) / BTEXN	P-30/1: 1828.2 Fill Material Screen	On Hold	SAMPLE COMMENTS
TOTAL NUMBER OF SAMPLES														
TOTAL NUMBER OF EXES														
S: Sample, C: Chain of Custody														
GENERAL COMMENTS:														
CUSTODY DETAILS														
Name		Date/Time Received												
SAAMPLER		28/05/2023												
GHD Workstation														
COURIER														
LABORATORY														

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**From:**  
**Sent:**  
**To:**  
**Subject:**  
**Attachments:**

Friday, 26 May 2023 11:36 AM  
COC Melbourne  
GHDSER - COCs for 12605152 (26/05/23) - Incoming Samples 26/5  
Contam\_ALS COC\_12605152\_Soil\_Water 260523.xlsx: Contam\_Eurofins COC\_  
12605152\_Soil\_Water 260523.xlsx

**Follow Up Flag:**  
**Flag Status:**

Follow up  
Flagged

**Categories:**

COC for incoming samples

**Kind Regards**



right solutions.  
right partner.

Client Services  
ALS Limited

2-4 Westall Road, Springvale VIC 3171

[alsglobal.com](http://alsglobal.com)

**CAUTION:** This email originated from outside of ALS. Do not click links or open attachments unless you recognize the sender and are sure content is relevant to you.

Hi

Please see attached COCs for collected samples that are to arrive at ALS Springvale before noon.

Warm regards,

## SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : EM2309440

Client : GHD PTY LTD  
Contact :   
Address : LEVEL 8, 180 LONSDALE ST  
MELBOURNE VIC, AUSTRALIA 3001

Laboratory : Environmental Division Melbourne  
Contact :   
Address : 4 Westall Rd Springvale VIC Australia  
3171

E-mail :   
Telephone :   
Facsimile :

E-mail :   
Telephone :   
Facsimile :

Project : 12605152  
Order number : 12605152

Page : 1 of 3  
Quote number : EM2021GHDSE0057 (MEBQ/005/21

C-O-C number : ----  
Site : ----  
Sampler :

QC Level : NEPM 2013 B3 & ALS QC Standard

### Dates

Date Samples Received : 26-May-2023 10:15  
Client Requested Due : 02-Jun-2023  
Date

Issue Date : 29-May-2023  
Scheduled Reporting Date : **02-Jun-2023**

### Delivery Details

Mode of Delivery : Carrier  
No. of coolers/boxes : 3  
Receipt Detail :

Security Seal : Not Available  
Temperature : 5.3°C - Ice present  
No. of samples received / analysed : 29 / 11

### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **Analytical work for this work order will be conducted at ALS Springvale.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

## Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exists.

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)	SOIL - P-30/4 EPA 1828.2 Table 3 Suite EPA 1828.2 Table 3 Fill Material Suite	SOIL - S-26 8 metals/TRH/BTEX/PAH
EM2309440-001	25-May-2023 00:00	AAN-BH01-0.1		✓	✓		✓
EM2309440-002	25-May-2023 00:00	AAN-BH01-0.5		✓	✓		✓
EM2309440-003	25-May-2023 00:00	AAN-BH01-1.0	✓				
EM2309440-004	25-May-2023 00:00	AAN-BH01-2.0	✓				
EM2309440-005	25-May-2023 00:00	AAN-BH01-3.0	✓				
EM2309440-006	25-May-2023 00:00	AAN-BH05-0.1		✓	✓	✓	
EM2309440-007	25-May-2023 00:00	AAN-BH05-0.5		✓	✓		✓
EM2309440-008	25-May-2023 00:00	AAN-BH05-1.0	✓				
EM2309440-009	25-May-2023 00:00	AAN-BH05-2.0	✓				
EM2309440-010	25-May-2023 00:00	AAN-BH05-3.0	✓				
EM2309440-011	25-May-2023 00:00	AAN-BH04-0.1		✓	✓		✓
EM2309440-012	25-May-2023 00:00	AAN-BH04-0.5		✓	✓		✓
EM2309440-013	25-May-2023 00:00	AAN-BH04-1.0	✓				
EM2309440-014	25-May-2023 00:00	AAN-BH04-1.7	✓				
EM2309440-015	25-May-2023 00:00	AAN-BH03-0.1		✓	✓	✓	
EM2309440-016	25-May-2023 00:00	AAN-BH03-0.5		✓	✓		✓
EM2309440-017	25-May-2023 00:00	AAN-BH03-1.0	✓				
EM2309440-018	25-May-2023 00:00	AAN-BH03-2.0	✓				
EM2309440-019	25-May-2023 00:00	AAN-BH03-3.0	✓				
EM2309440-020	25-May-2023 00:00	AAN-BH03-4.0	✓				
EM2309440-021	25-May-2023 00:00	AAN-BH02-0.1	✓				
EM2309440-022	25-May-2023 00:00	AAN-BH02-0.5	✓				
EM2309440-023	25-May-2023 00:00	AAN-BH02-1.0	✓				
EM2309440-024	25-May-2023 00:00	AAN-BH02-2.0	✓				
EM2309440-025	25-May-2023 00:00	AAN-BH02-3.0	✓				
EM2309440-026	25-May-2023 00:00	AAN-QC01		✓	✓		✓
EM2309440-027	25-May-2023 00:00	AAN-QC03	✓				

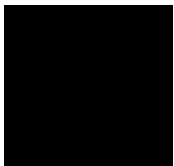


Matrix: <b>WATER</b>			WATER - W-18 TRH(C6 - C9)/BTEXN	WATER - W-27T TRH/BTEXN/PAH/Phenols/Total 8 Metals
Laboratory sample ID	Sampling date / time	Sample ID		
EM2309440-028	25-May-2023 00:00	RB01		✓
EM2309440-029	25-May-2023 00:00	TB01	✓	

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

[illegible]





## CERTIFICATE OF ANALYSIS

**Work Order** : EM2309440  
**Client** : GHD PTY LTD  
**Contact** :   
**Address** : LEVEL 8, 180 LONSDALE ST  
MELBOURNE VIC, AUSTRALIA 3001  
**Telephone** :   
**Project** : 12605152  
**Order number** : 12605152  
**C-O-C number** : ----  
**Sampler** :   
**Site** : ----  
**Quote number** : MEBQ/005/21 (Vic Only, Primary)  
**No. of samples received** : 29  
**No. of samples analysed** : 11

**Page** : 1 of 25  
**Laboratory** : Environmental Division Melbourne  
**Contact** :   
**Address** : 4 Westall Rd Springvale VIC Australia 3171  
**Telephone** :   
**Date Samples Received** : 26-May-2023 10:15  
**Date Analysis Commenced** : 29-May-2023  
**Issue Date** : 01-Jun-2023 17:55



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
	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
	Metals Team Leader	Melbourne Inorganics, Springvale, VIC
	2IC Organic Chemist	Melbourne Inorganics, Springvale, VIC
	2IC Organic Chemist	Melbourne Organics, Springvale, VIC

## General Comments

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

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

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

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

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

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

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

- EP075 (SIM): Where reported, 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.
- 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.
- EP074-UT: 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.
- EP074-UT: Where reported, Sum of trichlorobenzenes is the sum of the reported concentrations of 1,2,3-Trichlorobenzene and 1,2,4-Trichlorobenzene, and 1,3,5-Trichlorobenzene at or above the LOR.
- EP231X: Poor matrix spike recovery for sample EM2309416-001 due to sample matrix interference.
- EP066-EM/EP075-EM: Particular samples required dilution due to the presence of high level contaminants. LOR values have been adjusted accordingly.
- EK40T: EM2309533 Sample #7 Poor matrix spike recovery for Total Flouride due to sample matrix. Confirmed by re-extraction and re-analysis.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

















































## Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP066S: PCB Surrogate</b>			
Decachlorobiphenyl	2051-24-3	41	122
<b>EP074S: VOC Surrogates (Ultra-Trace)</b>			
1,2-Dichloroethane-D4	17060-07-0	59	119
Toluene-D8	2037-26-5	55	117
4-Bromofluorobenzene	460-00-4	59	123
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	54	125
2-Chlorophenol-D4	93951-73-6	65	123
2,4,6-Tribromophenol	118-79-6	34	122
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	61	125
Anthracene-d10	1719-06-8	62	130
4-Terphenyl-d14	1718-51-0	67	133
<b>EP075S: Acid Extractable Surrogates (Waste Classification)</b>			
Phenol-d6	13127-88-3	63	134
2-Chlorophenol-D4	93951-73-6	60	125
2,4,6-Tribromophenol	118-79-6	54	129
<b>EP075T: Base/Neutral Extractable Surrogates (Waste Classification)</b>			
Nitrobenzene-D5	4165-60-0	63	131
1,2-Dichlorobenzene-D4	2199-69-1	61	124
2-Fluorobiphenyl	321-60-8	69	131
Anthracene-d10	1719-06-8	70	133
4-Terphenyl-d14	1718-51-0	59	141
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	51	125
Toluene-D8	2037-26-5	55	125
4-Bromofluorobenzene	460-00-4	56	124
<b>EP231S: PFAS Surrogate</b>			
13C4-PFOS	----	68	136
13C8-PFOA	----	69	133

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	10	51
2-Chlorophenol-D4	93951-73-6	30	114
2,4,6-Tribromophenol	118-79-6	26	133
<b>EP075(SIM)T: PAH Surrogates</b>			

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP075(SIM)T: PAH Surrogates - Continued			
2-Fluorobiphenyl	321-60-8	35	127
Anthracene-d10	1719-06-8	44	122
4-Terphenyl-d14	1718-51-0	44	124
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	73	129
Toluene-D8	2037-26-5	70	125
4-Bromofluorobenzene	460-00-4	71	129

## Automated Guideline Comparison Report

Work Order : **EM2309440**

Client : **GHD PTY LTD**

Contact : [REDACTED]

Address : LEVEL 8, 180 LONSDALE ST  
MELBOURNE VIC, AUSTRALIA 3001

E-mail : [REDACTED]

Telephone : [REDACTED]

Facsimile : [REDACTED]

Project : 12605152

Order number : 12605152

C-O-C number : ----

No. of samples received : 29

No. of samples analysed : 11

Page : 1 of 18

Laboratory : Environmental Division Melbourne

Address : 4 Westall Rd Springvale VIC Australia 3171

E-mail : [REDACTED]

Telephone : [REDACTED]

Facsimile : + [REDACTED]

Date Received : 26-May-2023 10:15

Date Analysed : 29-May-2023

Date Issued : 01-Jun-2023 17:59

Quote number : MEBQ/005/21 (Vic Only, Primary)

### General Comments

Only results in the 'Analytical Results' section have been compared to the guideline.

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





























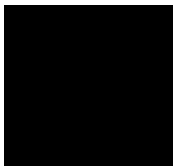












## QUALITY CONTROL REPORT

Work Order : EM2309440

Page : 1 of 27

Client : GHD PTY LTD

Laboratory : Environmental Division Melbourne

Contact : [REDACTED]

Contact : [REDACTED]

Address : LEVEL 8, 180 LONSDALE ST  
MELBOURNE VIC, AUSTRALIA 3001

Address : 4 Westall Rd Springvale VIC Australia 3171

Telephone : [REDACTED]

Telephone : [REDACTED]

Project : 12605152

Date Samples Received : 26-May-2023

Order number : 12605152

Date Analysis Commenced : 29-May-2023

C-O-C number : ----

Issue Date : 01-Jun-2023

Sampler : [REDACTED]

Site : ----

Quote number : MEBQ/005/21 (Vic Only, Primary)

No. of samples received : 29

No. of samples analysed : 11



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

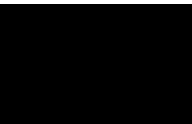
### Signatories

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



Senior Inorganic Chemist

Melbourne Inorganics, Springvale, VIC

Metals Team Leader

Melbourne Inorganics, Springvale, VIC

2IC Organic Chemist

Melbourne Inorganics, Springvale, VIC

2IC Organic Chemist

Melbourne Organics, Springvale, VIC

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 5078850)									
EM2308677-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	72	69	4.4	0% - 20%
		EG005T: Molybdenum	7439-98-7	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	90	96	6.8	0% - 20%
		EG005T: Silver	7440-22-4	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	11	10	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	33	37	12.6	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	6	8	26.9	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Tin	7440-31-5	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	36	39	9.0	No Limit
EM2309440-006	AAN-BH05-0.1	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	23	19	17.4	0% - 50%
		EG005T: Molybdenum	7439-98-7	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	84	70	18.0	0% - 20%
		EG005T: Silver	7440-22-4	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	6	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	42	33	25.6	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	25	18	30.1	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Tin	7440-31-5	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	50	40	22.1	No Limit
EA001: pH in soil using 0.01M CaCl extract (QC Lot: 5080779)									
EM2309404-001	Anonymous	EA001: pH (CaCl2)	----	0.1	pH Unit	7.9	7.9	0.0	0% - 20%

Page : 3 of 27  
 Work Order : EM2309440  
 Client : GHD PTY LTD  
 Project : 12605152

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 (%)
<b>EA001: pH in soil using 0.01M CaCl extract (QC Lot: 5080779) - continued</b>									
EM2309533-001	Anonymous	EA001: pH (CaCl2)	----	0.1	pH Unit	11.7	11.7	0.0	0% - 20%
<b>EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5077751)</b>									
EM2308677-001	Anonymous	EA055: Moisture Content	----	0.1	%	23.4	23.8	1.7	0% - 20%
EM2309380-009	Anonymous	EA055: Moisture Content	----	0.1	%	12.9	12.6	2.0	0% - 50%
<b>EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5077752)</b>									
EM2309440-026	AAN-QC01	EA055: Moisture Content	----	0.1	%	23.8	21.8	9.0	0% - 20%
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 5078851)</b>									
EM2308677-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.1	0.0	No Limit
EM2309440-006	AAN-BH05-0.1	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EG048: Hexavalent Chromium (Alkaline Digest) (QC Lot: 5080108)</b>									
EM2309251-001	Anonymous	EG048G: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EM2309462-003	Anonymous	EG048G: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EK026SF: Total CN by Segmented Flow Analyser (QC Lot: 5081387)</b>									
EM2309148-001	Anonymous	EK026SF: Total Cyanide	57-12-5	1	mg/kg	<1	<1	0.0	No Limit
EM2309380-004	Anonymous	EK026SF: Total Cyanide	57-12-5	1	mg/kg	52	52	0.0	0% - 20%
<b>EK040T: Fluoride Total (QC Lot: 5079854)</b>									
EM2309404-001	Anonymous	EK040T: Fluoride	16984-48-8	40	mg/kg	260	260	0.0	No Limit
EM2309514-003	Anonymous	EK040T: Fluoride	16984-48-8	40	mg/kg	120	60	72.2	No Limit
<b>EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 5079031)</b>									
EM2309440-006	AAN-BH05-0.1	EP066-EM: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.2	<0.2	0.0	No Limit
EM2309544-003	Anonymous	EP066-EM: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 5079076)</b>									
EM2309440-006	AAN-BH05-0.1	EP074-UT: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP074-UT: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074-UT: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074-UT: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
		EP074-UT: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074-UT: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074H: Naphthalene (QC Lot: 5079076)</b>									
EM2309440-006	AAN-BH05-0.1	EP074-UT: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
<b>EP074I: Volatile Halogenated Compounds (QC Lot: 5079076)</b>									
EM2309440-006	AAN-BH05-0.1	EP074-UT: 1,1-Dichloroethene	75-35-4	0.01	mg/kg	<0.01	<0.01	0.0	No Limit
		EP074-UT: cis-1,2-Dichloroethene	156-59-2	0.01	mg/kg	<0.01	<0.01	0.0	No Limit
		EP074-UT: 1,1,1-Trichloroethane	71-55-6	0.01	mg/kg	<0.01	<0.01	0.0	No Limit
		EP074-UT: Carbon Tetrachloride	56-23-5	0.01	mg/kg	<0.01	<0.01	0.0	No Limit
		EP074-UT: 1,1,1,2-Tetrachloroethane	630-20-6	0.01	mg/kg	<0.01	<0.01	0.0	No Limit
		EP074-UT: 1,2,4-Trichlorobenzene	120-82-1	0.01	mg/kg	<0.01	<0.01	0.0	No Limit

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Work Order : EM2309440  
Client : GHD PTY LTD  
Project : 12605152

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 (%)
EP074I: Volatile Halogenated Compounds (QC Lot: 5079076) - continued									
EM2309440-006	AAN-BH05-0.1	EP074-UT: Vinyl chloride	75-01-4	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP074-UT: trans-1.2-Dichloroethene	156-60-5	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP074-UT: Chloroform	67-66-3	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP074-UT: 1.2-Dichloroethane	107-06-2	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP074-UT: Trichloroethene	79-01-6	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP074-UT: Tetrachloroethene	127-18-4	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP074-UT: 1.1.2.2-Tetrachloroethane	79-34-5	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP074-UT: Hexachlorobutadiene	87-68-3	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP074-UT: Chlorobenzene	108-90-7	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP074-UT: 1.4-Dichlorobenzene	106-46-7	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP074-UT: 1.2-Dichlorobenzene	95-50-1	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP074-UT: 1.1.2-Trichloroethane	79-00-5	0.04	mg/kg	<0.04	<0.04	0.0	No Limit
EM2309380-001	Anonymous	EP074-UT: Methylene chloride	75-09-2	0.4	mg/kg	<0.4	<0.4	0.0	No Limit
		EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 5079035)							
		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	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			205-82-3						
		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
EM2309440-001	AAN-BH01-0.1	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



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 Work Order : EM2309440  
 Client : GHD PTY LTD  
 Project : 12605152

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 (%)
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 5079035) - continued</b>									
EM2309440-001	AAN-BH01-0.1	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	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			205-82-3						
		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): Dibenzo(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
<b>EP075A: Phenolic Compounds (Halogenated) (QC Lot: 5079029)</b>									
EM2309440-006	AAN-BH05-0.1	EP075-EM: 2-Chlorophenol	95-57-8	0.03	mg/kg	<0.07	<0.07	0.0	No Limit
		EP075-EM: 2,4-Dichlorophenol	120-83-2	0.03	mg/kg	<0.07	<0.07	0.0	No Limit
		EP075-EM: 2,6-Dichlorophenol	87-65-0	0.03	mg/kg	<0.07	<0.07	0.0	No Limit
		EP075-EM: 4-Chloro-3-methylphenol	59-50-7	0.03	mg/kg	<0.07	<0.07	0.0	No Limit
		EP075-EM: 2,3,5,6-Tetrachlorophenol	935-95-5	0.03	mg/kg	<0.07	<0.07	0.0	No Limit
		EP075-EM: 2,4,5-Trichlorophenol	95-95-4	0.05	mg/kg	<0.07	<0.07	0.0	No Limit
		EP075-EM: 2,4,6-Trichlorophenol	88-06-2	0.05	mg/kg	<0.07	<0.07	0.0	No Limit
		EP075-EM: 2,3,4,5 & 2,3,4,6-Tetrachlorophenol	4901-51-3/58-9 0-2	0.05	mg/kg	<0.15	<0.14	0.0	No Limit
		EP075-EM: Pentachlorophenol	87-86-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EM2309544-003	Anonymous	EP075-EM: 2-Chlorophenol	95-57-8	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: 2,4-Dichlorophenol	120-83-2	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: 2,6-Dichlorophenol	87-65-0	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: 4-Chloro-3-methylphenol	59-50-7	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: 2,3,5,6-Tetrachlorophenol	935-95-5	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: 2,4,5-Trichlorophenol	95-95-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP075-EM: 2,4,6-Trichlorophenol	88-06-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP075-EM: 2,3,4,5 & 2,3,4,6-Tetrachlorophenol	4901-51-3/58-9 0-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP075-EM: Pentachlorophenol	87-86-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
<b>EP075A: Phenolic Compounds (Non-halogenated) (QC Lot: 5079029)</b>									
EM2309440-006	AAN-BH05-0.1	EP075-EM: Phenol	108-95-2	1	mg/kg	<1	<1	0.0	No Limit
		EP075-EM: 2-Methylphenol	95-48-7	1	mg/kg	<1	<1	0.0	No Limit
		EP075-EM: 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075-EM: 2-Nitrophenol	88-75-5	1	mg/kg	<1	<1	0.0	No Limit
		EP075-EM: 2,4-Dimethylphenol	105-67-9	1	mg/kg	<1	<1	0.0	No Limit
		EP075-EM: 2,4-Dinitrophenol	51-28-5	5	mg/kg	<5	<5	0.0	No Limit
		EP075-EM: 4-Nitrophenol	100-02-7	5	mg/kg	<5	<5	0.0	No Limit
		EP075-EM: 2-Methyl-4,6-dinitrophenol	8071-51-0	5	mg/kg	<5	<5	0.0	No Limit
		EP075-EM: Dinoseb	88-85-7	5	mg/kg	<5	<5	0.0	No Limit
		EP075-EM: 2-Cyclohexyl-4,6-Dinitrophenol	131-89-5	5	mg/kg	<5	<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 (%)
EP075A: Phenolic Compounds (Non-halogenated) (QC Lot: 5079029) - continued									
EM2309544-003	Anonymous	EP075-EM: Phenol	108-95-2	1	mg/kg	<1	<1	0.0	No Limit
		EP075-EM: 2-Methylphenol	95-48-7	1	mg/kg	<1	<1	0.0	No Limit
		EP075-EM: 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075-EM: 2-Nitrophenol	88-75-5	1	mg/kg	<1	<1	0.0	No Limit
		EP075-EM: 2.4-Dimethylphenol	105-67-9	1	mg/kg	<1	<1	0.0	No Limit
		EP075-EM: 2.4-Dinitrophenol	51-28-5	5	mg/kg	<5	<5	0.0	No Limit
		EP075-EM: 4-Nitrophenol	100-02-7	5	mg/kg	<5	<5	0.0	No Limit
		EP075-EM: 2-Methyl-4.6-dinitrophenol	8071-51-0	5	mg/kg	<5	<5	0.0	No Limit
		EP075-EM: Dinoseb	88-85-7	5	mg/kg	<5	<5	0.0	No Limit
	EP075-EM: 2-Cyclohexyl-4.6-Dinitrophenol	131-89-5	5	mg/kg	<5	<5	0.0	No Limit	
EP075B: Polynuclear Aromatic Hydrocarbons (QC Lot: 5079029)									
EM2309440-006	AAN-BH05-0.1	EP075-EM: Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	1	mg/kg	<1.0	<1.0	0.0	No Limit
EM2309544-003	Anonymous	EP075-EM: Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

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 Work Order : EM2309440  
 Client : GHD PTY LTD  
 Project : 12605152

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 (%)
EP075B: Polynuclear Aromatic Hydrocarbons (QC Lot: 5079029) - continued									
EM2309544-003	Anonymous	EP075-EM: Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Benzo(b+j) & Benzo(k)fluoranthene	205-99-2	1	mg/kg	<1.0	<1.0	0.0	No Limit
			207-08-9						
EP075I: Organochlorine Pesticides (QC Lot: 5079029)									
EM2309440-006	AAN-BH05-0.1	EP075-EM: alpha-BHC	319-84-6	0.03	mg/kg	<0.07	<0.07	0.0	No Limit
		EP075-EM: Hexachlorobenzene (HCB)	118-74-1	0.03	mg/kg	<0.07	<0.07	0.0	No Limit
		EP075-EM: beta-BHC	319-85-7	0.03	mg/kg	<0.07	<0.07	0.0	No Limit
		EP075-EM: gamma-BHC	58-89-9	0.03	mg/kg	<0.07	<0.07	0.0	No Limit
		EP075-EM: delta-BHC	319-86-8	0.03	mg/kg	<0.07	<0.07	0.0	No Limit
		EP075-EM: Heptachlor	76-44-8	0.03	mg/kg	<0.07	<0.07	0.0	No Limit
		EP075-EM: Aldrin	309-00-2	0.03	mg/kg	<0.07	<0.07	0.0	No Limit
		EP075-EM: Heptachlor epoxide	1024-57-3	0.03	mg/kg	<0.07	<0.07	0.0	No Limit
		EP075-EM: cis-Chlordane	5103-71-9	0.03	mg/kg	<0.07	<0.07	0.0	No Limit
		EP075-EM: trans-Chlordane	5103-74-2	0.03	mg/kg	<0.07	<0.07	0.0	No Limit
		EP075-EM: Endosulfan 1	959-98-8	0.03	mg/kg	<0.07	<0.07	0.0	No Limit
		EP075-EM: Dieldrin	60-57-1	0.03	mg/kg	<0.07	<0.07	0.0	No Limit
		EP075-EM: Endrin aldehyde	7421-93-4	0.03	mg/kg	<0.07	<0.07	0.0	No Limit
		EP075-EM: Endrin	72-20-8	0.03	mg/kg	<0.07	<0.07	0.0	No Limit
		EP075-EM: Endosulfan 2	33213-65-9	0.03	mg/kg	<0.07	<0.07	0.0	No Limit
		EP075-EM: Endosulfan sulfate	1031-07-8	0.03	mg/kg	<0.07	<0.07	0.0	No Limit
		EP075-EM: Methoxychlor	72-43-5	0.03	mg/kg	<0.07	<0.07	0.0	No Limit
		EP075-EM: 4,4'-DDE	72-55-9	0.05	mg/kg	<0.07	<0.07	0.0	No Limit
		EP075-EM: 4,4'-DDD	72-54-8	0.05	mg/kg	<0.07	<0.07	0.0	No Limit
		EP075-EM: 4,4'-DDT	50-29-3	0.05	mg/kg	<0.07	<0.07	0.0	No Limit
EM2309544-003	Anonymous	EP075-EM: alpha-BHC	319-84-6	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: Hexachlorobenzene (HCB)	118-74-1	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: beta-BHC	319-85-7	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: gamma-BHC	58-89-9	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: delta-BHC	319-86-8	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: Heptachlor	76-44-8	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: Aldrin	309-00-2	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: Heptachlor epoxide	1024-57-3	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: cis-Chlordane	5103-71-9	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: trans-Chlordane	5103-74-2	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: Endosulfan 1	959-98-8	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: Dieldrin	60-57-1	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: Endrin aldehyde	7421-93-4	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: Endrin	72-20-8	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: Endosulfan 2	33213-65-9	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: Endosulfan sulfate	1031-07-8	0.03	mg/kg	<0.03	<0.03	0.0	No Limit

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 Client : GHD PTY LTD  
 Project : 12605152

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 (%)
EP075I: Organochlorine Pesticides (QC Lot: 5079029) - continued									
EM2309544-003	Anonymous	EP075-EM: Methoxychlor	72-43-5	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: 4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP075-EM: 4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP075-EM: 4,4'-DDT	50-29-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5077677)									
EM2309404-003	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EM2309553-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5079030)									
EM2309440-006	AAN-BH05-0.1	EP071-EM: C15 - C28 Fraction	----	100	mg/kg	520	500	2.4	No Limit
		EP071-EM: C29 - C36 Fraction	----	100	mg/kg	570	590	3.4	No Limit
		EP071-EM: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EM2309544-003	Anonymous	EP071-EM: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071-EM: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071-EM: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5079036)									
EM2309380-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	110	<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
EM2309440-001	AAN-BH01-0.1	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: 5079076)									
EM2309440-006	AAN-BH05-0.1	EP074-UT: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5077677)									
EM2309404-003	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EM2309553-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5079030)									
EM2309440-006	AAN-BH05-0.1	EP071-EM: >C16 - C34 Fraction	----	100	mg/kg	930	930	0.0	No Limit
		EP071-EM: >C34 - C40 Fraction	----	100	mg/kg	460	480	5.7	No Limit
		EP071-EM: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EM2309544-003	Anonymous	EP071-EM: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071-EM: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071-EM: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5079036)									
EM2309380-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	130	120	12.4	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
EM2309440-001	AAN-BH01-0.1	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

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 Work Order : EM2309440  
 Client : GHD PTY LTD  
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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 Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5079036) - continued									
EM2309440-001	AAN-BH01-0.1	EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5079076)									
EM2309440-006	AAN-BH05-0.1	EP074-UT: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
		EP074-UT: C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	0.0	No Limit
EP080: BTEXN (QC Lot: 5077677)									
EM2309404-003	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	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EM2309553-001	Anonymous	EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
		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	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
		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: 5077809)									
EM2309358-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0002	0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0048	0.0052	9.1	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	0.0002	0.0003	0.0	No Limit
EM2309440-026	AAN-QC01	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	0.0027	0.0023	16.6	0% - 50%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5077809)									
EM2309358-002	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0008	0.0007	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	0.0007	0.0007	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5077809) - continued									
EM2309358-002	Anonymous	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	0.0005	0.0004	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
EM2309440-026	AAN-QC01	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: 5077809)									
EM2309358-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EM2309440-026	AAN-QC01	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

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 Client : GHD PTY LTD  
 Project : 12605152

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: 5077809) - continued									
EM2309440-026	AAN-QC01	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: 5077809)									
EM2309358-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EM2309440-026	AAN-QC01	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5077809)									
EM2309358-002	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0072	0.0075	4.1	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0050	0.0054	7.7	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0058	0.0061	5.0	0% - 20%
EM2309440-026	AAN-QC01	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0029	0.0023	23.1	0% - 50%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0029	0.0023	23.1	0% - 50%
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0029	0.0023	23.1	0% - 50%
Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG020T: Total Metals by ICP-MS (QC Lot: 5083013)									
EM2309440-028	RB01	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
EM2309522-005	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.001	0.001	0.0	No Limit

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 Client : GHD PTY LTD  
 Project : 12605152

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG020T: Total Metals by ICP-MS (QC Lot: 5083013) - continued									
EM2309522-005	Anonymous	EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.009	0.009	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.005	0.004	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.016	0.015	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 5081145)									
EM2309235-008	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EM2309419-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EP075(SIM)A: Phenolic Compounds (QC Lot: 5077438)									
EM2309407-037	Anonymous	EP075(SIM): Phenol	108-95-2	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	2	µg/L	<2.0	<2.0	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	µg/L	<2.0	<2.0	0.0	No Limit
EM2309496-004	Anonymous	EP075(SIM): Phenol	108-95-2	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	2	µg/L	<2.0	<2.0	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	µg/L	<2.0	<2.0	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 5077438)									
EM2309407-037	Anonymous	EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	<1.0	0.0	No Limit



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 Work Order : EM2309440  
 Client : GHD PTY LTD  
 Project : 12605152

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 5077438) - continued										
EM2309407-037	Anonymous	EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	<1.0	0.0	No Limit	
		EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	<1.0	0.0	No Limit	
		EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	<1.0	0.0	No Limit	
		EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	<1.0	0.0	No Limit	
		EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	<1.0	0.0	No Limit	
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	1	µg/L	<1.0	<1.0	0.0	No Limit	
			205-82-3							
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	<1.0	0.0	No Limit	
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	<1.0	0.0	No Limit	
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	1	µg/L	<1.0	<1.0	0.0	No Limit	
	EP075(SIM): Benzo(g,h,i)perylene	191-24-2	1	µg/L	<1.0	<1.0	0.0	No Limit		
EM2309496-004	Anonymous	EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	<1.0	0.0	No Limit	
		EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	<1.0	0.0	No Limit	
		EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	<1.0	0.0	No Limit	
		EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	<1.0	0.0	No Limit	
		EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	<1.0	0.0	No Limit	
		EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	<1.0	0.0	No Limit	
		EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	<1.0	0.0	No Limit	
		EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	<1.0	0.0	No Limit	
		EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	<1.0	0.0	No Limit	
		EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	<1.0	0.0	No Limit	
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	1	µg/L	<1.0	<1.0	0.0	No Limit	
			205-82-3							
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	<1.0	0.0	No Limit	
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	<1.0	0.0	No Limit	
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	1	µg/L	<1.0	<1.0	0.0	No Limit	
			EP075(SIM): Benzo(g,h,i)perylene	191-24-2	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5077414)								
EM2309251-025	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit	
EM2309478-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit	
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5077428)										
EM2309280-011	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit	
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5077439)										
EM2309407-037	Anonymous	EP071: C15 - C28 Fraction	----	100	µg/L	<100	<100	0.0	No Limit	
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.0	No Limit	
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.0	No Limit	
EM2309496-004	Anonymous	EP071: C15 - C28 Fraction	----	100	µg/L	<100	120	21.6	No Limit	
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.0	No Limit	
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	70	34.2	No Limit	

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 Work Order : EM2309440  
 Client : GHD PTY LTD  
 Project : 12605152

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5077414)									
EM2309251-025	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EM2309478-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5077428)									
EM2309280-011	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5077439)									
EM2309407-037	Anonymous	EP071: >C10 - C16 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
EM2309496-004	Anonymous	EP071: >C10 - C16 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	120	180	38.2	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	400	120	No Limit
EP080: BTEXN (QC Lot: 5077414)									
EM2309251-025	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
EM2309478-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
EP080: BTEXN (QC Lot: 5077428)									
EM2309280-011	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	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 Concentration	Spike Recovery (%)	Acceptable Limits (%)	
						LCS	Low	High
Method: Compound	CAS Number	LOR	Unit	Result				
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5078850)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	123 mg/kg	74.9	70.0	130
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	1.23 mg/kg	67.3	50.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	20.2 mg/kg	108	70.0	130
EG005T: Copper	7440-50-8	5	mg/kg	<5	55.9 mg/kg	88.6	70.0	130
EG005T: Lead	7439-92-1	5	mg/kg	<5	62.4 mg/kg	95.1	70.0	130
EG005T: Molybdenum	7439-98-7	2	mg/kg	<2	2.19 mg/kg	73.2	70.0	130
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.4 mg/kg	99.4	70.0	130
EG005T: Selenium	7782-49-2	5	mg/kg	<5	----	----	----	----
EG005T: Silver	7440-22-4	2	mg/kg	<2	2.9 mg/kg	79.1	70.0	130
EG005T: Tin	7440-31-5	5	mg/kg	<5	5.33 mg/kg	92.3	70.0	130
EG005T: Zinc	7440-66-6	5	mg/kg	<5	162 mg/kg	78.5	70.0	130
EA001: pH in soil using 0.01M CaCl extract (QCLot: 5080779)								
EA001: pH (CaCl2)	----	----	pH Unit	----	4 pH Unit	101	98.8	101
				----	7 pH Unit	101	99.3	101
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5078851)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.64 mg/kg	103	70.0	130
EG048: Hexavalent Chromium (Alkaline Digest) (QCLot: 5080108)								
EG048G: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	20 mg/kg	80.9	70.0	130
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 5081387)								
EK026SF: Total Cyanide	57-12-5	1	mg/kg	<1	20 mg/kg	96.8	70.0	130
EK040T: Fluoride Total (QCLot: 5079854)								
EK040T: Fluoride	16984-48-8	40	mg/kg	<40	334 mg/kg	106	93.1	107
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 5079031)								
EP066-EM: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	118	67.4	136
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 5079076)								
EP074-UT: Benzene	71-43-2	0.2	mg/kg	<0.2	2.1 mg/kg	89.9	69.2	116
EP074-UT: Toluene	108-88-3	0.5	mg/kg	<0.5	2.1 mg/kg	88.2	67.7	116
EP074-UT: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2.1 mg/kg	86.7	66.6	115
EP074-UT: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	4.2 mg/kg	85.6	65.2	112
	106-42-3							
EP074-UT: Styrene	100-42-5	0.5	mg/kg	<0.5	2.1 mg/kg	85.5	69.4	111

Sub-Matrix: **SOIL**

Sub-Matrix: <b>SOIL</b>				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low      High	
Method: Compound	CAS Number	LOR	Unit	Result				
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 5079076) - continued</b>								
EP074-UT: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2.1 mg/kg	84.5	68.4	110
<b>EP074H: Naphthalene (QCLot: 5079076)</b>								
EP074-UT: Naphthalene	91-20-3	1	mg/kg	<1	0.6 mg/kg	90.4	72.3	114
<b>EP074I: Volatile Halogenated Compounds (QCLot: 5079076)</b>								
EP074-UT: Vinyl chloride	75-01-4	0.02	mg/kg	<0.02	0.1 mg/kg	86.1	47.0	138
EP074-UT: 1,1-Dichloroethene	75-35-4	0.01	mg/kg	<0.01	0.1 mg/kg	93.0	57.6	125
EP074-UT: Methylene chloride	75-09-2	0.4	mg/kg	<0.4	2.1 mg/kg	91.4	72.3	115
EP074-UT: trans-1,2-Dichloroethene	156-60-5	0.02	mg/kg	<0.02	0.1 mg/kg	91.0	60.5	122
EP074-UT: cis-1,2-Dichloroethene	156-59-2	0.01	mg/kg	<0.01	0.1 mg/kg	90.4	70.3	112
EP074-UT: Chloroform	67-66-3	0.02	mg/kg	<0.02	0.1 mg/kg	90.3	66.6	115
EP074-UT: 1,1,1-Trichloroethane	71-55-6	0.01	mg/kg	<0.01	0.1 mg/kg	89.0	64.4	122
EP074-UT: Carbon Tetrachloride	56-23-5	0.01	mg/kg	<0.01	0.1 mg/kg	87.2	58.4	127
EP074-UT: 1,2-Dichloroethane	107-06-2	0.02	mg/kg	<0.02	0.1 mg/kg	92.2	72.9	114
EP074-UT: Trichloroethene	79-01-6	0.02	mg/kg	<0.02	0.1 mg/kg	87.2	64.7	115
EP074-UT: 1,1,2-Trichloroethane	79-00-5	0.04	mg/kg	<0.04	0.1 mg/kg	96.2	72.6	116
EP074-UT: Tetrachloroethene	127-18-4	0.02	mg/kg	<0.02	0.1 mg/kg	86.2	60.0	119
EP074-UT: 1,1,1,2-Tetrachloroethane	630-20-6	0.01	mg/kg	<0.01	0.1 mg/kg	90.1	71.8	116
EP074-UT: 1,1,2,2-Tetrachloroethane	79-34-5	0.02	mg/kg	<0.02	0.1 mg/kg	91.8	66.1	116
EP074-UT: Hexachlorobutadiene	87-68-3	0.02	mg/kg	<0.02	0.1 mg/kg	71.6	39.8	128
EP074-UT: Chlorobenzene	108-90-7	0.02	mg/kg	<0.02	0.1 mg/kg	89.2	70.3	113
EP074-UT: 1,4-Dichlorobenzene	106-46-7	0.02	mg/kg	<0.02	0.1 mg/kg	79.4	62.6	113
EP074-UT: 1,2-Dichlorobenzene	95-50-1	0.02	mg/kg	<0.02	0.1 mg/kg	84.2	70.8	110
EP074-UT: 1,2,4-Trichlorobenzene	120-82-1	0.01	mg/kg	<0.01	0.1 mg/kg	73.3	48.4	120
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 5079035)</b>								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	3 mg/kg	99.5	85.7	123
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	3 mg/kg	101	81.0	123
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	3 mg/kg	103	83.6	120
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	3 mg/kg	99.3	81.3	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	3 mg/kg	106	79.4	123
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	3 mg/kg	107	81.7	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	3 mg/kg	102	78.3	124
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	3 mg/kg	102	79.9	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	3 mg/kg	97.8	76.9	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	3 mg/kg	97.5	80.9	130

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 5079035) - continued								
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	3 mg/kg	94.4	70.0	121
	205-82-3							
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	3 mg/kg	117	80.4	130
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	3 mg/kg	101	70.2	123
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	3 mg/kg	102	67.9	122
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	3 mg/kg	102	65.8	123
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	3 mg/kg	99.3	65.8	127
EP075A: Phenolic Compounds (Halogenated) (QCLot: 5079029)								
EP075-EM: 2-Chlorophenol	95-57-8	0.03	mg/kg	<0.03	2 mg/kg	116	74.5	126
EP075-EM: 2,4-Dichlorophenol	120-83-2	0.03	mg/kg	<0.03	2 mg/kg	117	72.7	126
EP075-EM: 2,6-Dichlorophenol	87-65-0	0.03	mg/kg	<0.03	2 mg/kg	117	73.5	132
EP075-EM: 4-Chloro-3-methylphenol	59-50-7	0.03	mg/kg	<0.03	2 mg/kg	119	72.8	128
EP075-EM: 2,4,5-Trichlorophenol	95-95-4	0.05	mg/kg	<0.05	2 mg/kg	119	73.3	134
EP075-EM: 2,4,6-Trichlorophenol	88-06-2	0.05	mg/kg	<0.05	2 mg/kg	117	72.4	128
EP075-EM: 2,3,5,6-Tetrachlorophenol	935-95-5	0.03	mg/kg	<0.03	2 mg/kg	116	69.4	126
EP075-EM: 2,3,4,5 & 2,3,4,6-Tetrachlorophenol	4901-51-3/5	0.05	mg/kg	<0.05	4 mg/kg	118	71.9	128
	8-90-2							
EP075-EM: Pentachlorophenol	87-86-5	0.2	mg/kg	<0.2	4 mg/kg	115	54.4	135
EP075A: Phenolic Compounds (Non-halogenated) (QCLot: 5079029)								
EP075-EM: Phenol	108-95-2	1	mg/kg	<1	2 mg/kg	116	71.5	130
EP075-EM: 2-Methylphenol	95-48-7	1	mg/kg	<1	2 mg/kg	116	73.4	129
EP075-EM: 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	4 mg/kg	115	74.3	129
EP075-EM: 2-Nitrophenol	88-75-5	1	mg/kg	<1	2 mg/kg	114	70.9	133
EP075-EM: 2,4-Dimethylphenol	105-67-9	1	mg/kg	<1	2 mg/kg	110	71.8	132
EP075-EM: 2,4-Dinitrophenol	51-28-5	5	mg/kg	<5	10 mg/kg	80.3	41.0	156
EP075-EM: 4-Nitrophenol	100-02-7	5	mg/kg	<5	10 mg/kg	127	65.3	134
EP075-EM: 2-Methyl-4,6-dinitrophenol	8071-51-0	5	mg/kg	<5	10 mg/kg	101	43.6	128
EP075-EM: Dinoseb	88-85-7	5	mg/kg	<5	10 mg/kg	109	62.0	128
EP075-EM: 2-Cyclohexyl-4,6-Dinitrophenol	131-89-5	5	mg/kg	<5	10 mg/kg	93.4	34.5	137
EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 5079029)								
EP075-EM: Naphthalene	91-20-3	0.5	mg/kg	<0.5	2 mg/kg	116	73.0	131
EP075-EM: Acenaphthene	83-32-9	0.5	mg/kg	<0.5	2 mg/kg	117	76.3	130
EP075-EM: Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	2 mg/kg	117	72.0	135
EP075-EM: Fluorene	86-73-7	0.5	mg/kg	<0.5	2 mg/kg	118	74.4	131
EP075-EM: Phenanthrene	85-01-8	0.5	mg/kg	<0.5	2 mg/kg	116	73.3	130



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 Client : GHD PTY LTD  
 Project : 12605152

Sub-Matrix: **SOIL**

Method: Compound				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%)	
CAS Number	LOR	Unit	Result				Low	High
<b>EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 5079029) - continued</b>								
EP075-EM: Anthracene	120-12-7	0.5	mg/kg	<0.5	2 mg/kg	116	78.4	127
EP075-EM: Fluoranthene	206-44-0	0.5	mg/kg	<0.5	2 mg/kg	118	75.3	132
EP075-EM: Pyrene	129-00-0	0.5	mg/kg	<0.5	2 mg/kg	117	75.4	130
EP075-EM: Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	2 mg/kg	117	69.6	133
EP075-EM: Chrysene	218-01-9	0.5	mg/kg	<0.5	2 mg/kg	116	75.0	133
EP075-EM: Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	1	mg/kg	<1.0	4 mg/kg	116	75.8	133
EP075-EM: Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	2 mg/kg	116	65.1	130
EP075-EM: Indeno(1,2,3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	2 mg/kg	116	72.1	134
EP075-EM: Dibenzo(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	2 mg/kg	116	72.9	135
EP075-EM: Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	2 mg/kg	116	71.3	134
<b>EP075I: Organochlorine Pesticides (QCLot: 5079029)</b>								
EP075-EM: alpha-BHC	319-84-6	0.03	mg/kg	<0.03	2 mg/kg	117	71.0	129
EP075-EM: Hexachlorobenzene (HCB)	118-74-1	0.03	mg/kg	<0.03	2 mg/kg	115	74.8	126
EP075-EM: beta-BHC	319-85-7	0.03	mg/kg	<0.03	2 mg/kg	119	75.7	130
EP075-EM: gamma-BHC	58-89-9	0.03	mg/kg	<0.03	2 mg/kg	116	70.8	130
EP075-EM: delta-BHC	319-86-8	0.03	mg/kg	<0.03	2 mg/kg	117	76.5	134
EP075-EM: Heptachlor	76-44-8	0.03	mg/kg	<0.03	2 mg/kg	116	75.5	131
EP075-EM: Aldrin	309-00-2	0.03	mg/kg	<0.03	2 mg/kg	116	76.8	130
EP075-EM: Heptachlor epoxide	1024-57-3	0.03	mg/kg	<0.03	2 mg/kg	117	73.6	130
EP075-EM: cis-Chlordane	5103-71-9	0.03	mg/kg	<0.03	2 mg/kg	116	75.0	133
EP075-EM: trans-Chlordane	5103-74-2	0.03	mg/kg	<0.03	2 mg/kg	117	75.3	131
EP075-EM: Endosulfan 1	959-98-8	0.03	mg/kg	<0.03	2 mg/kg	120	69.4	134
EP075-EM: 4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	2 mg/kg	114	71.0	132
EP075-EM: Dieldrin	60-57-1	0.03	mg/kg	<0.03	2 mg/kg	114	78.0	133
EP075-EM: Endrin aldehyde	7421-93-4	0.03	mg/kg	<0.03	2 mg/kg	111	69.0	143
EP075-EM: Endrin	72-20-8	0.03	mg/kg	<0.03	2 mg/kg	144	55.7	145
EP075-EM: Endosulfan 2	33213-65-9	0.03	mg/kg	<0.03	2 mg/kg	121	71.4	135
EP075-EM: 4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	2 mg/kg	116	74.8	134
EP075-EM: Endosulfan sulfate	1031-07-8	0.03	mg/kg	<0.03	2 mg/kg	116	70.2	135
EP075-EM: 4,4'-DDT	50-29-3	0.05	mg/kg	<0.05	2 mg/kg	115	77.7	133
EP075-EM: Methoxychlor	72-43-5	0.03	mg/kg	<0.03	2 mg/kg	120	63.6	135
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 5077677)</b>								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	36 mg/kg	93.8	58.6	131

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 Work Order : EM2309440  
 Client : GHD PTY LTD  
 Project : 12605152

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result			Low	High
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 5079030)</b>								
EP071-EM: C10 - C14 Fraction	----	50	mg/kg	<50	770 mg/kg	118	74.4	129
EP071-EM: C15 - C28 Fraction	----	100	mg/kg	<100	2860 mg/kg	107	81.0	123
EP071-EM: C29 - C36 Fraction	----	100	mg/kg	<100	1540 mg/kg	108	81.8	121
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 5079036)</b>								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	770 mg/kg	121	75.0	128
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	2860 mg/kg	108	82.0	123
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	1540 mg/kg	111	82.4	121
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 5079076)</b>								
EP074-UT: C6 - C9 Fraction	----	10	mg/kg	<10	39.6 mg/kg	94.4	61.1	119
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5077677)</b>								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	45 mg/kg	87.1	59.3	128
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5079030)</b>								
EP071-EM: >C10 - C16 Fraction	----	50	mg/kg	<50	1170 mg/kg	100	75.4	132
EP071-EM: >C16 - C34 Fraction	----	100	mg/kg	<100	3830 mg/kg	109	80.8	120
EP071-EM: >C34 - C40 Fraction	----	100	mg/kg	<100	290 mg/kg	97.0	73.3	136
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5079036)</b>								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	1170 mg/kg	103	77.0	130
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	3830 mg/kg	111	81.5	120
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	290 mg/kg	97.8	73.3	137
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5079076)</b>								
EP074-UT: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	48.9 mg/kg	91.6	59.9	119
EP074-UT: C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX X	10	mg/kg	<10	----	----	----	----
<b>EP080: BTEXN (QCLot: 5077677)</b>								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	92.5	61.6	117
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	100	65.8	125
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	92.8	65.8	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	98.4	64.8	134
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	97.6	68.7	132
EP080: Naphthalene	91-20-3	1	mg/kg	<1	0.5 mg/kg	91.7	61.8	123
<b>EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5077809)</b>								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00111 mg/kg	95.1	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	87.3	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00114 mg/kg	82.6	67.0	130

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 Project : 12605152

Sub-Matrix: **SOIL**

Method: Compound				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%)	
CAS Number	LOR	Unit	Result				Low	High
<b>EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5077809) - continued</b>								
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	91.4	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	83.2	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00121 mg/kg	88.0	59.0	134
<b>EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5077809)</b>								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	88.7	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.1	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	81.9	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.3	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.2	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.0	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.4	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.6	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.9	69.0	135
EP231X: Perfluorotridecanoic acid (PFTriDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.2	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	86.2	69.0	133
<b>EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5077809)</b>								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	94.3	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	90.0	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	90.2	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	96.2	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.2	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.9	61.0	139
<b>EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5077809)</b>								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	88.0	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00119 mg/kg	92.8	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	97.4	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00121 mg/kg	89.2	70.0	130
<b>EP231P: PFAS Sums (QCLot: 5077809)</b>								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----



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Sub-Matrix: <b>SOIL</b>				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low      High	
Method: <i>Compound</i>	CAS Number	LOR	Unit	Result				
EP231P: PFAS Sums (QCLot: 5077809) - continued								
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
						LCS	Low	High
Method: Compound	CAS Number	LOR	Unit	Result				
EG020T: Total Metals by ICP-MS (QCLot: 5083013)								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	110	89.2	115
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	106	86.4	115
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	104	86.9	112
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	110	86.9	111
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	103	88.3	112
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	109	87.9	113
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	113	86.7	117
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5081145)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	96.3	73.4	119
EP075(SIM)A: Phenolic Compounds (QCLot: 5077438)								
EP075(SIM): Phenol	108-95-2	1	µg/L	<1.0	5 µg/L	34.2	17.8	51.1
EP075(SIM): 2-Chlorophenol	95-57-8	1	µg/L	<1.0	5 µg/L	77.0	43.2	107
EP075(SIM): 2-Methylphenol	95-48-7	1	µg/L	<1.0	5 µg/L	68.8	39.2	98.7
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	2	µg/L	<2.0	10 µg/L	63.6	35.5	91.3
EP075(SIM): 2-Nitrophenol	88-75-5	1	µg/L	<1.0	5 µg/L	85.8	34.4	124
EP075(SIM): 2,4-Dimethylphenol	105-67-9	1	µg/L	<1.0	5 µg/L	78.0	44.4	112
EP075(SIM): 2,4-Dichlorophenol	120-83-2	1	µg/L	<1.0	5 µg/L	83.0	45.3	115
EP075(SIM): 2,6-Dichlorophenol	87-65-0	1	µg/L	<1.0	5 µg/L	83.4	44.3	116
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	1	µg/L	<1.0	5 µg/L	80.8	46.6	117
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	1	µg/L	<1.0	5 µg/L	83.8	38.2	122
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	1	µg/L	<1.0	5 µg/L	85.4	43.2	123
EP075(SIM): Pentachlorophenol	87-86-5	2	µg/L	<2.0	10 µg/L	72.7	48.1	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 5077438)								
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	77.2	42.8	114
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	76.5	48.6	119
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	78.7	47.0	117
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	84.5	49.5	119
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	87.0	49.4	121
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	85.0	48.4	122

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Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result			Low	High
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 5077438) - continued</b>								
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	91.7	50.3	124
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	91.8	50.0	126
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	92.3	49.4	127
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	93.2	48.7	126
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	1	µg/L	<1.0	5 µg/L	82.8	54.5	134
	205-82-3							
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	84.8	56.1	134
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	79.7	55.6	135
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	88.1	54.4	126
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	87.8	54.5	126
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	88.8	54.4	126
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 5077414)</b>								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	85.3	66.2	134
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 5077428)</b>								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	99.2	66.2	134
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 5077439)</b>								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	4560 µg/L	90.8	47.2	122
EP071: C15 - C28 Fraction	----	100	µg/L	<100	16200 µg/L	92.3	52.9	131
EP071: C29 - C36 Fraction	----	50	µg/L	<50	8650 µg/L	95.6	50.4	127
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5077414)</b>								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	88.0	66.2	132
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5077428)</b>								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	95.9	66.2	132
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5077439)</b>								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	6190 µg/L	89.2	49.1	125
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	22200 µg/L	92.5	51.6	128
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	1520 µg/L	91.0	47.2	130
<b>EP080: BTEXN (QCLot: 5077414)</b>								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	95.3	68.8	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	93.7	72.9	129
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	93.2	71.7	130
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	40 µg/L	94.4	72.3	136
	106-42-3							
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	95.4	75.9	134
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	91.5	68.3	131

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP080: BTEXN (QCLot: 5077428)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	98.5	68.8	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	96.5	72.9	129
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	95.5	71.7	130
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	40 µg/L	100.0	72.3	136
	106-42-3							
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	105	75.9	134
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	90.1	68.3	131

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				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5078850)							
EM2308677-002	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	91.0	78.0	124
		EG005T: Cadmium	7440-43-9	50 mg/kg	98.7	79.7	116
		EG005T: Chromium	7440-47-3	50 mg/kg	92.7	79.0	121
		EG005T: Copper	7440-50-8	250 mg/kg	102	80.0	120
		EG005T: Lead	7439-92-1	250 mg/kg	98.4	80.0	120
		EG005T: Nickel	7440-02-0	50 mg/kg	95.1	78.0	120
		EG005T: Zinc	7440-66-6	250 mg/kg	97.0	80.0	120
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5078851)							
EM2308677-002	Anonymous	EG035T: Mercury	7439-97-6	0.5 mg/kg	109	76.0	116
EG048: Hexavalent Chromium (Alkaline Digest) (QCLot: 5080108)							
EM2309251-011	Anonymous	EG048G: Hexavalent Chromium	18540-29-9	20 mg/kg	# 49.9	58.0	114
EM2309251-011	Anonymous	EG048G: Hexavalent Chromium	18540-29-9	20 mg/kg	62.7	58.0	114
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 5081387)							
EM2309251-001	Anonymous	EK026SF: Total Cyanide	57-12-5	20 mg/kg	107	70.0	130
EK040T: Fluoride Total (QCLot: 5079854)							
EM2309404-004	Anonymous	EK040T: Fluoride	16984-48-8	400 mg/kg	87.5	70.0	130
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 5079031)							
EM2309462-017	Anonymous	EP066-EM: Total Polychlorinated biphenyls	----	1 mg/kg	110	59.6	152
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 5079076)							
EM2309440-015	AAN-BH03-0.1	EP074-UT: Benzene	71-43-2	2 mg/kg	93.8	53.7	130

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 Client : GHD PTY LTD  
 Project : 12605152

Sub-Matrix: SOIL

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 5079076) - continued							
EM2309440-015	AAN-BH03-0.1	EP074-UT: Toluene	108-88-3	2 mg/kg	96.2	55.1	124
EP074I: Volatile Halogenated Compounds (QCLot: 5079076)							
EM2309440-015	AAN-BH03-0.1	EP074-UT: 1,1-Dichloroethene	75-35-4	2 mg/kg	84.9	38.4	145
		EP074-UT: Trichloroethene	79-01-6	2 mg/kg	85.9	48.1	128
		EP074-UT: Chlorobenzene	108-90-7	2 mg/kg	88.3	55.5	122
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 5079035)							
EM2309380-002	Anonymous	EP075(SIM): Acenaphthene	83-32-9	3 mg/kg	95.3	77.2	116
		EP075(SIM): Pyrene	129-00-0	3 mg/kg	79.8	65.5	136
EP075A: Phenolic Compounds (Halogenated) (QCLot: 5079029)							
EM2309440-015	AAN-BH03-0.1	EP075-EM: 2-Chlorophenol	95-57-8	3 mg/kg	111	44.0	143
		EP075-EM: 4-Chloro-3-methylphenol	59-50-7	3 mg/kg	111	41.5	139
		EP075-EM: Pentachlorophenol	87-86-5	3 mg/kg	93.6	10.0	144
EP075A: Phenolic Compounds (Non-halogenated) (QCLot: 5079029)							
EM2309440-015	AAN-BH03-0.1	EP075-EM: Phenol	108-95-2	3 mg/kg	106	44.2	134
		EP075-EM: 2-Nitrophenol	88-75-5	3 mg/kg	105	34.2	129
EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 5079029)							
EM2309440-015	AAN-BH03-0.1	EP075-EM: Acenaphthene	83-32-9	3 mg/kg	111	42.6	138
		EP075-EM: Pyrene	129-00-0	3 mg/kg	110	37.8	152
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5077677)							
EM2309404-005	Anonymous	EP080: C6 - C9 Fraction	----	28 mg/kg	76.6	33.4	124
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5079030)							
EM2309462-009	Anonymous	EP071-EM: C10 - C14 Fraction	----	770 mg/kg	114	71.3	126
		EP071-EM: C15 - C28 Fraction	----	2860 mg/kg	102	75.1	123
		EP071-EM: C29 - C36 Fraction	----	1540 mg/kg	103	78.1	120
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5079036)							
EM2309380-003	Anonymous	EP071: C10 - C14 Fraction	----	770 mg/kg	120	71.2	125
		EP071: C15 - C28 Fraction	----	2860 mg/kg	108	75.6	122
		EP071: C29 - C36 Fraction	----	1540 mg/kg	111	78.0	120
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5079076)							
EM2309440-015	AAN-BH03-0.1	EP074-UT: C6 - C9 Fraction	----	28 mg/kg	92.7	42.3	111
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5077677)							
EM2309404-005	Anonymous	EP080: C6 - C10 Fraction	C6_C10	33 mg/kg	72.4	30.8	120
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5079030)							
EM2309462-009	Anonymous	EP071-EM: >C10 - C16 Fraction	----	1170 mg/kg	96.1	71.5	130
		EP071-EM: >C16 - C34 Fraction	----	3830 mg/kg	104	76.9	119

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 Work Order : EM2309440  
 Client : GHD PTY LTD  
 Project : 12605152

Sub-Matrix: **SOIL**

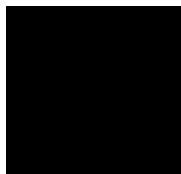
Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5079030) - continued							
EM2309462-009	Anonymous	EP071-EM: >C34 - C40 Fraction	----	290 mg/kg	93.6	65.3	139
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5079036)							
EM2309380-003	Anonymous	EP071: >C10 - C16 Fraction	----	1170 mg/kg	102	72.2	128
		EP071: >C16 - C34 Fraction	----	3830 mg/kg	111	76.5	119
		EP071: >C34 - C40 Fraction	----	290 mg/kg	99.0	66.8	138
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5079076)							
EM2309440-015	AAN-BH03-0.1	EP074-UT: C6 - C10 Fraction	C6_C10	33 mg/kg	83.9	39.9	109
EP080: BTEXN (QCLot: 5077677)							
EM2309404-005	Anonymous	EP080: Benzene	71-43-2	2 mg/kg	86.2	54.4	127
		EP080: Toluene	108-88-3	2 mg/kg	92.6	57.1	131
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5077809)							
EM2309416-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00111 mg/kg	# Not Determined	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00118 mg/kg	# Not Determined	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00114 mg/kg	# Not Determined	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	# Not Determined	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	# Not Determined	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00121 mg/kg	# Not Determined	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5077809)							
EM2309416-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	# Not Determined	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	# Not Determined	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	# Not Determined	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	# Not Determined	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	# Not Determined	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	# Not Determined	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	# Not Determined	69.0	133



Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
				Concentration	MS	Low	High
Laboratory sample ID	Sample ID	Method: Compound	CAS Number				
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5077809) - continued							
EM2309416-001	Anonymous	EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	# Not Determined	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	# Not Determined	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	# Not Determined	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	# 49.9	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5077809)							
EM2309416-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	# Not Determined	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	89.2	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	82.7	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	85.6	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	92.8	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	# 59.3	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	# 52.0	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5077809)							
EM2309416-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	76.7	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00119 mg/kg	# Not Determined	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	# Not Determined	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00121 mg/kg	# Not Determined	70.0	130

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
				Concentration	MS	Low	High
Laboratory sample ID	Sample ID	Method: Compound	CAS Number				
EG020T: Total Metals by ICP-MS (QCLot: 5083013)							
EM2309440-028	RB01	EG020A-T: Arsenic	7440-38-2	1 mg/L	99.3	82.0	123
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	99.7	81.8	123
		EG020A-T: Chromium	7440-47-3	1 mg/L	106	78.9	119
		EG020A-T: Copper	7440-50-8	1 mg/L	104	80.4	118
		EG020A-T: Lead	7439-92-1	1 mg/L	101	80.5	121

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 5083013) - continued							
EM2309440-028	RB01	EG020A-T: Nickel	7440-02-0	1 mg/L	98.8	80.0	118
		EG020A-T: Zinc	7440-66-6	1 mg/L	99.1	74.0	120
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5081145)							
EM2309235-009	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	109	70.0	130
EP075(SIM)A: Phenolic Compounds (QCLot: 5077438)							
EM2309407-041	Anonymous	EP075(SIM): Phenol	108-95-2	5 µg/L	31.4	15.0	61.0
		EP075(SIM): 2-Chlorophenol	95-57-8	5 µg/L	73.5	35.0	131
		EP075(SIM): 2-Nitrophenol	88-75-5	5 µg/L	79.4	39.0	121
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	5 µg/L	79.9	32.0	130
		EP075(SIM): Pentachlorophenol	87-86-5	5 µg/L	80.1	11.0	147
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 5077438)							
EM2309407-041	Anonymous	EP075(SIM): Acenaphthene	83-32-9	5 µg/L	77.8	39.3	123
		EP075(SIM): Pyrene	129-00-0	5 µg/L	98.6	44.0	124
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5077414)							
EM2309251-026	Anonymous	EP080: C6 - C9 Fraction	----	280 µg/L	78.8	33.9	126
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5077428)							
EM2309407-042	Anonymous	EP080: C6 - C9 Fraction	----	280 µg/L	83.4	33.9	126
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5077414)							
EM2309251-026	Anonymous	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	72.9	34.0	122
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5077428)							
EM2309407-042	Anonymous	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	80.8	34.0	122
EP080: BTEXN (QCLot: 5077414)							
EM2309251-026	Anonymous	EP080: Benzene	71-43-2	20 µg/L	94.5	56.3	133
		EP080: Toluene	108-88-3	20 µg/L	99.1	60.4	132
EP080: BTEXN (QCLot: 5077428)							
EM2309407-042	Anonymous	EP080: Benzene	71-43-2	20 µg/L	92.3	56.3	133
		EP080: Toluene	108-88-3	20 µg/L	94.1	60.4	132



## QA/QC Compliance Assessment to assist with Quality Review

Work Order : EM2309440

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Client : GHD PTY LTD

Laboratory : Environmental Division Melbourne

Contact : [REDACTED]

Telephone : [REDACTED]

Project : 12605152

Date Samples Received : 26-May-2023

Site : ----

Issue Date : 01-Jun-2023

Sampler : [REDACTED]

No. of samples received : 29

Order number : 12605152

No. of samples analysed : 11

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

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

### Summary of Outliers

#### Outliers : Quality Control Samples

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

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- Matrix Spike outliers exist - please see following pages for full details.
- For all regular sample matrices, **NO** surrogate recovery outliers occur.

#### Outliers : Analysis Holding Time Compliance

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

#### Outliers : Frequency of Quality Control Samples

- Quality Control Sample Frequency Outliers exist - please see following pages for full details.



## Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
<b>Matrix Spike (MS) Recoveries</b>							
EG048: Hexavalent Chromium (Alkaline Digest)	EM2309251--011	Anonymous	Hexavalent Chromium	18540-29-9	49.9 %	58.0-114%	Recovery less than lower data quality objective
EP231A: Perfluoroalkyl Sulfonic Acids	EM2309416--001	Anonymous	Perfluorobutane sulfonic acid (PFBS)	375-73-5	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231A: Perfluoroalkyl Sulfonic Acids	EM2309416--001	Anonymous	Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231A: Perfluoroalkyl Sulfonic Acids	EM2309416--001	Anonymous	Perfluorohexane sulfonic acid (PFHxS)	355-46-4	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231A: Perfluoroalkyl Sulfonic Acids	EM2309416--001	Anonymous	Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231A: Perfluoroalkyl Sulfonic Acids	EM2309416--001	Anonymous	Perfluorooctane sulfonic acid (PFOS)	1763-23-1	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231A: Perfluoroalkyl Sulfonic Acids	EM2309416--001	Anonymous	Perfluorodecane sulfonic acid (PFDS)	335-77-3	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231B: Perfluoroalkyl Carboxylic Acids	EM2309416--001	Anonymous	Perfluorobutanoic acid (PFBA)	375-22-4	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231B: Perfluoroalkyl Carboxylic Acids	EM2309416--001	Anonymous	Perfluoropentanoic acid (PFPeA)	2706-90-3	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231B: Perfluoroalkyl Carboxylic Acids	EM2309416--001	Anonymous	Perfluorohexanoic acid (PFHxA)	307-24-4	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231B: Perfluoroalkyl Carboxylic Acids	EM2309416--001	Anonymous	Perfluoroheptanoic acid (PFHpA)	375-85-9	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231B: Perfluoroalkyl Carboxylic Acids	EM2309416--001	Anonymous	Perfluorooctanoic acid (PFOA)	335-67-1	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231B: Perfluoroalkyl Carboxylic Acids	EM2309416--001	Anonymous	Perfluorononanoic acid (PFNA)	375-95-1	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
<b>Matrix Spike (MS) Recoveries - Continued</b>							
EP231B: Perfluoroalkyl Carboxylic Acids	EM2309416--001	Anonymous	Perfluorodecanoic acid (PFDA)	335-76-2	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231B: Perfluoroalkyl Carboxylic Acids	EM2309416--001	Anonymous	Perfluoroundecanoic acid (PFUnDA)	2058-94-8	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231B: Perfluoroalkyl Carboxylic Acids	EM2309416--001	Anonymous	Perfluorododecanoic acid (PFDoDA)	307-55-1	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231B: Perfluoroalkyl Carboxylic Acids	EM2309416--001	Anonymous	Perfluorotetradecanoic acid (PFTeDA)	376-06-7	49.9 %	69.0-133%	Recovery less than lower data quality objective
EP231C: Perfluoroalkyl Sulfonamides	EM2309416--001	Anonymous	Perfluorooctane sulfonamide (FOSA)	754-91-6	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231C: Perfluoroalkyl Sulfonamides	EM2309416--001	Anonymous	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	59.3 %	63.0-144%	Recovery less than lower data quality objective
EP231C: Perfluoroalkyl Sulfonamides	EM2309416--001	Anonymous	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	52.0 %	61.0-139%	Recovery less than lower data quality objective
EP231D: (n:2) Fluorotelomer Sulfonic Acids	EM2309416--001	Anonymous	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231D: (n:2) Fluorotelomer Sulfonic Acids	EM2309416--001	Anonymous	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231D: (n:2) Fluorotelomer Sulfonic Acids	EM2309416--001	Anonymous	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

**Outliers : Frequency of Quality Control Samples**

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
	0				
<b>Matrix Spikes (MS)</b>					
TRH - Semivolatile Fraction	0	15	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

### Analysis Holding Time Compliance

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

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

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

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

Matrix: SOIL

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis			
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EA001: pH in soil using 0.01M CaCl extract								
Soil Glass Jar - Unpreserved (EA001) AAN-BH05-0.1,	AAN-BH03-0.1	25-May-2023	30-May-2023	01-Jun-2023	✓	30-May-2023	30-May-2023	✓
EA055: Moisture Content (Dried @ 105-110°C)								
Soil Glass Jar - Unpreserved (EA055) AAN-BH01-0.1, AAN-BH05-0.1, AAN-BH04-0.1, AAN-BH03-0.1, AAN-QC01	AAN-BH01-0.5, AAN-BH05-0.5, AAN-BH04-0.5, AAN-BH03-0.5,	25-May-2023	---	---	---	29-May-2023	08-Jun-2023	✓
EG005(ED093)T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved (EG005T) AAN-BH01-0.1, AAN-BH05-0.1, AAN-BH04-0.1, AAN-BH03-0.1, AAN-QC01	AAN-BH01-0.5, AAN-BH05-0.5, AAN-BH04-0.5, AAN-BH03-0.5,	25-May-2023	30-May-2023	21-Nov-2023	✓	30-May-2023	21-Nov-2023	✓
EG035T: Total Recoverable Mercury by FIMS								
Soil Glass Jar - Unpreserved (EG035T) AAN-BH01-0.1, AAN-BH05-0.1, AAN-BH04-0.1, AAN-BH03-0.1, AAN-QC01	AAN-BH01-0.5, AAN-BH05-0.5, AAN-BH04-0.5, AAN-BH03-0.5,	25-May-2023	30-May-2023	22-Jun-2023	✓	30-May-2023	22-Jun-2023	✓
EG048: Hexavalent Chromium (Alkaline Digest)								
Soil Glass Jar - Unpreserved (EG048G) AAN-BH05-0.1,	AAN-BH03-0.1	25-May-2023	30-May-2023	22-Jun-2023	✓	01-Jun-2023	06-Jun-2023	✓
EK026SF: Total CN by Segmented Flow Analyser								
Soil Glass Jar - Unpreserved (EK026SF) AAN-BH05-0.1,	AAN-BH03-0.1	25-May-2023	30-May-2023	08-Jun-2023	✓	01-Jun-2023	13-Jun-2023	✓
EK040T: Fluoride Total								
Soil Glass Jar - Unpreserved (EK040T) AAN-BH05-0.1,	AAN-BH03-0.1	25-May-2023	30-May-2023	22-Jun-2023	✓	01-Jun-2023	22-Jun-2023	✓

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EP066: Polychlorinated Biphenyls (PCB)</b>							
Soil Glass Jar - Unpreserved (EP066-EM) AAN-BH05-0.1, AAN-BH03-0.1	25-May-2023	30-May-2023	08-Jun-2023	✓	31-May-2023	09-Jul-2023	✓
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>							
Soil Glass Jar - Unpreserved (EP074-UT) AAN-BH05-0.1, AAN-BH03-0.1	25-May-2023	29-May-2023	01-Jun-2023	✓	30-May-2023	01-Jun-2023	✓
<b>EP074H: Naphthalene</b>							
Soil Glass Jar - Unpreserved (EP074-UT) AAN-BH05-0.1, AAN-BH03-0.1	25-May-2023	29-May-2023	01-Jun-2023	✓	30-May-2023	01-Jun-2023	✓
<b>EP074I: Volatile Halogenated Compounds</b>							
Soil Glass Jar - Unpreserved (EP074-UT) AAN-BH05-0.1, AAN-BH03-0.1	25-May-2023	29-May-2023	01-Jun-2023	✓	30-May-2023	01-Jun-2023	✓
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>							
Soil Glass Jar - Unpreserved (EP075(SIM)) AAN-BH01-0.1, AAN-BH05-0.5, AAN-BH04-0.5, AAN-QC01	25-May-2023	30-May-2023	08-Jun-2023	✓	31-May-2023	09-Jul-2023	✓
<b>EP075A: Phenolic Compounds (Halogenated)</b>							
Soil Glass Jar - Unpreserved (EP075-EM) AAN-BH05-0.1, AAN-BH03-0.1	25-May-2023	30-May-2023	08-Jun-2023	✓	31-May-2023	09-Jul-2023	✓
<b>EP075A: Phenolic Compounds (Non-halogenated)</b>							
Soil Glass Jar - Unpreserved (EP075-EM) AAN-BH05-0.1, AAN-BH03-0.1	25-May-2023	30-May-2023	08-Jun-2023	✓	31-May-2023	09-Jul-2023	✓
<b>EP075B: Polynuclear Aromatic Hydrocarbons</b>							
Soil Glass Jar - Unpreserved (EP075-EM) AAN-BH05-0.1, AAN-BH03-0.1	25-May-2023	30-May-2023	08-Jun-2023	✓	31-May-2023	09-Jul-2023	✓
<b>EP075I: Organochlorine Pesticides</b>							
Soil Glass Jar - Unpreserved (EP075-EM) AAN-BH05-0.1, AAN-BH03-0.1	25-May-2023	30-May-2023	08-Jun-2023	✓	31-May-2023	09-Jul-2023	✓

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved (EP080)		25-May-2023	29-May-2023	08-Jun-2023	✓	30-May-2023	08-Jun-2023	✓
AAN-BH01-0.1, AAN-BH05-0.1, AAN-BH04-0.1, AAN-BH03-0.1, AAN-QC01	AAN-BH01-0.5, AAN-BH05-0.5, AAN-BH04-0.5, AAN-BH03-0.5,							
Soil Glass Jar - Unpreserved (EP071)		25-May-2023	30-May-2023	08-Jun-2023	✓	30-May-2023	09-Jul-2023	✓
AAN-BH01-0.1, AAN-BH05-0.5, AAN-BH04-0.5, AAN-QC01	AAN-BH01-0.5, AAN-BH04-0.1, AAN-BH03-0.5,							
Soil Glass Jar - Unpreserved (EP071-EM)		25-May-2023	30-May-2023	08-Jun-2023	✓	31-May-2023	09-Jul-2023	✓
AAN-BH05-0.1,	AAN-BH03-0.1							
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
Soil Glass Jar - Unpreserved (EP080)		25-May-2023	29-May-2023	08-Jun-2023	✓	30-May-2023	08-Jun-2023	✓
AAN-BH01-0.1, AAN-BH05-0.1, AAN-BH04-0.1, AAN-BH03-0.1, AAN-QC01	AAN-BH01-0.5, AAN-BH05-0.5, AAN-BH04-0.5, AAN-BH03-0.5,							
Soil Glass Jar - Unpreserved (EP071)		25-May-2023	30-May-2023	08-Jun-2023	✓	30-May-2023	09-Jul-2023	✓
AAN-BH01-0.1, AAN-BH05-0.5, AAN-BH04-0.5, AAN-QC01	AAN-BH01-0.5, AAN-BH04-0.1, AAN-BH03-0.5,							
Soil Glass Jar - Unpreserved (EP071-EM)		25-May-2023	30-May-2023	08-Jun-2023	✓	31-May-2023	09-Jul-2023	✓
AAN-BH05-0.1,	AAN-BH03-0.1							
EP080: BTEXN								
Soil Glass Jar - Unpreserved (EP080)		25-May-2023	29-May-2023	08-Jun-2023	✓	30-May-2023	08-Jun-2023	✓
AAN-BH01-0.1, AAN-BH05-0.5, AAN-BH04-0.5, AAN-QC01	AAN-BH01-0.5, AAN-BH04-0.1, AAN-BH03-0.5,							
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X)		25-May-2023	29-May-2023	21-Nov-2023	✓	31-May-2023	08-Jul-2023	✓
AAN-BH01-0.1, AAN-BH05-0.1, AAN-BH04-0.1, AAN-BH03-0.1, AAN-QC01	AAN-BH01-0.5, AAN-BH05-0.5, AAN-BH04-0.5, AAN-BH03-0.5,							

Matrix: SOIL

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis			
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X) AAN-BH01-0.1, AAN-BH05-0.1, AAN-BH04-0.1, AAN-BH03-0.1, AAN-QC01	AAN-BH01-0.5, AAN-BH05-0.5, AAN-BH04-0.5, AAN-BH03-0.5,	25-May-2023	29-May-2023	21-Nov-2023	✓	31-May-2023	08-Jul-2023	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X) AAN-BH01-0.1, AAN-BH05-0.1, AAN-BH04-0.1, AAN-BH03-0.1, AAN-QC01	AAN-BH01-0.5, AAN-BH05-0.5, AAN-BH04-0.5, AAN-BH03-0.5,	25-May-2023	29-May-2023	21-Nov-2023	✓	31-May-2023	08-Jul-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X) AAN-BH01-0.1, AAN-BH05-0.1, AAN-BH04-0.1, AAN-BH03-0.1, AAN-QC01	AAN-BH01-0.5, AAN-BH05-0.5, AAN-BH04-0.5, AAN-BH03-0.5,	25-May-2023	29-May-2023	21-Nov-2023	✓	31-May-2023	08-Jul-2023	✓
EP231P: PFAS Sums								
HDPE Soil Jar (EP231X) AAN-BH01-0.1, AAN-BH05-0.1, AAN-BH04-0.1, AAN-BH03-0.1, AAN-QC01	AAN-BH01-0.5, AAN-BH05-0.5, AAN-BH04-0.5, AAN-BH03-0.5,	25-May-2023	29-May-2023	21-Nov-2023	✓	31-May-2023	08-Jul-2023	✓

Matrix: WATER

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T) RB01	25-May-2023	31-May-2023	21-Nov-2023	✓	31-May-2023	21-Nov-2023	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T) RB01	25-May-2023	----	----	----	30-May-2023	22-Jun-2023	✓
EP075(SIM)A: Phenolic Compounds							
Amber Glass Bottle - Unpreserved (EP075(SIM)) RB01	25-May-2023	29-May-2023	01-Jun-2023	✓	31-May-2023	08-Jul-2023	✓



Matrix: WATER		Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.					
Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM)) RB01	25-May-2023	29-May-2023	01-Jun-2023	✔	31-May-2023	08-Jul-2023	✔
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071) RB01	25-May-2023	29-May-2023	01-Jun-2023	✔	31-May-2023	08-Jul-2023	✔
Amber VOC Vial - Sulfuric Acid (EP080) TB01	25-May-2023	29-May-2023	08-Jun-2023	✔	30-May-2023	08-Jun-2023	✔
Amber VOC Vial - Sulfuric Acid (EP080) RB01	25-May-2023	29-May-2023	08-Jun-2023	✔	31-May-2023	08-Jun-2023	✔
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071) RB01	25-May-2023	29-May-2023	01-Jun-2023	✔	31-May-2023	08-Jul-2023	✔
Amber VOC Vial - Sulfuric Acid (EP080) TB01	25-May-2023	29-May-2023	08-Jun-2023	✔	30-May-2023	08-Jun-2023	✔
Amber VOC Vial - Sulfuric Acid (EP080) RB01	25-May-2023	29-May-2023	08-Jun-2023	✔	31-May-2023	08-Jun-2023	✔
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080) TB01	25-May-2023	29-May-2023	08-Jun-2023	✔	30-May-2023	08-Jun-2023	✔
Amber VOC Vial - Sulfuric Acid (EP080) RB01	25-May-2023	29-May-2023	08-Jun-2023	✔	31-May-2023	08-Jun-2023	✔

## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **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)							
Hexavalent Chromium by Alkaline Digestion and DA Finish	EG048G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055	3	26	11.54	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PCB - VIC EPA 448.3 Screen	EP066-EM	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	11	18.18	10.00	✓	NEPM 2013 B3 & ALS QC Standard
pH in soil using a 0.01M CaCl2 extract	EA001	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds - Waste Classification	EP075-EM	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Fluoride	EK040T	2	20	10.00	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	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071-EM	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds - Ultra-trace	EP074-UT	1	5	20.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Hexavalent Chromium by Alkaline Digestion and DA Finish	EG048G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PCB - VIC EPA 448.3 Screen	EP066-EM	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
pH in soil using a 0.01M CaCl2 extract	EA001	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds - Waste Classification	EP075-EM	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Fluoride	EK040T	1	20	5.00	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	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071-EM	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds - Ultra-trace	EP074-UT	1	5	20.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Hexavalent Chromium by Alkaline Digestion and DA Finish	EG048G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PCB - VIC EPA 448.3 Screen	EP066-EM	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds - Waste Classification	EP075-EM	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard



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	
Method Blanks (MB) - Continued							
Total Cyanide by Segmented Flow Analyser	EK026SF	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Fluoride	EK040T	1	20	5.00	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	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071-EM	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds - Ultra-trace	EP074-UT	1	5	20.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Hexavalent Chromium by Alkaline Digestion and DA Finish	EG048G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PCB - VIC EPA 448.3 Screen	EP066-EM	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds - Waste Classification	EP075-EM	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Fluoride	EK040T	1	20	5.00	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	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071-EM	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds - Ultra-trace	EP074-UT	1	5	20.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	2	12	16.67	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-MS - Suite A	EG020A-T	2	8	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	15	13.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	3	26	11.54	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	12	8.33	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-MS - Suite A	EG020A-T	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	26	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification .

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Method Blanks (MB) - Continued							
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	8	12.50	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	15	6.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	26	7.69	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	12	8.33	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-MS - Suite A	EG020A-T	1	8	12.50	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	15	0.00	5.00	✖	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	26	7.69	5.00	✔	NEPM 2013 B3 & ALS QC Standard

## Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
pH in soil using a 0.01M CaCl <sub>2</sub> extract	EA001	SOIL	In house: Referenced to Rayment and Lyons 4B3 (mod.) or 4B4 (mod.) 10 g of soil is mixed with 50 mL of 0.01M CaCl <sub>2</sub> and tumbled end over end for 1 hour. pH is measured from the continuous suspension. This method is compliant with NEPM Schedule B(3).
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 (SnCl <sub>2</sub> ) (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 SnCl <sub>2</sub> 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)
Hexavalent Chromium by Alkaline Digestion and DA Finish	EG048G	SOIL	In house: Referenced to USEPA SW846, Method 3060. Hexavalent chromium is extracted by alkaline digestion. The digest is determined by photometrically by automatic discrete analyser, following pH adjustment. The instrument uses colour development using dephenylcarbazide. Each run of samples is measured against a five-point calibration curve. This method is compliant with NEPM Schedule B(3)
Total Cyanide by Segmented Flow Analyser	EK026SF	SOIL	In house: Referenced to APHA 4500-CN C / ASTM D7511 / ISO 14403. Caustic leachates of soil samples are introduced into an automated segmented flow analyser. Complex bound cyanide is decomposed in a continuously flowing stream, at a pH of 3.8, by the effect of UV light. A UV-B lamp (312 nm) and a decomposition spiral of borosilicate glass are used to filter out UV light with a wavelength of less than 290 nm thus preventing the conversion of thiocyanate into cyanide. The hydrogen cyanide present at a pH of 3.8 is separated by gas dialysis. The hydrogen cyanide is then determined photometrically, based on the reaction of cyanide with chloramine-T to form cyanogen chloride. This then reacts with 4-pyridine carboxylic acid and 1,3-dimethylbarbituric acid to give a red colour which is measured at 600 nm. This method is compliant with NEPM Schedule B(3).
Total Fluoride	EK040T	SOIL	(In-house) Total fluoride is determined by ion specific electrode (ISE) in a solution obtained after a Sodium Carbonate / Potassium Carbonate fusion dissolution.
PCB - VIC EPA 448.3 Screen	EP066-EM	SOIL	In house: Referenced to USEPA SW 846 - 8270 Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point 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).
TRH - Semivolatile Fraction	EP071-EM	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40.

Analytical Methods	Method	Matrix	Method Descriptions
Volatile Organic Compounds - Ultra-trace	EP074-UT	SOIL	In house: Referenced to USEPA SW 846 - 8260 Extracts are analysed by Purge and Trap, Capillary GC/MS in partial SIM/Scan mode. Quantification is by comparison against an established multi-point calibration curves. This method is compliant with NEPM Schedule B(3).
Volatile Organic Compounds - Ultra-trace - Summations	EP074-UT-SUM	SOIL	Summation of MAHs and VHCs
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)
Semivolatile Organic Compounds - Waste Classification	EP075-EM	SOIL	In house: Referenced to USEPA SW 846 - 8270 Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM Schedule B(3).
SVOC - Waste Classification (Sums)	EP075-EM-SUM	SOIL	Summations for EP075 (EM variation)
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.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> 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	WATER	In house: Referenced to USEPA SW 846 - 8015 The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM Schedule B(3)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS in SIM Mode 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	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM Schedule B(3)
Preparation Methods	Method	Matrix	Method Descriptions



Preparation Methods	Method	Matrix	Method Descriptions
NaOH leach for CN in Soils	CN-PR	SOIL	In house: APHA 4500 CN. Samples are extracted by end-over-end tumbling with NaOH.
pH in soil using a 0.01M CaCl2 extract	EA001-PR	SOIL	In house: Referenced to Rayment and Lyons 4B1, 10 g of soil is mixed with 50 mL of 0.01M CaCl2 and tumbled end over end for 1 hour. pH is measured from the continuous suspension. This method is compliant with NEPM Schedule B(3).
Alkaline digestion for Hexavalent Chromium	EG048PR	SOIL	In house: Referenced to USEPA SW846, Method 3060A.
Total Fluoride	EK040T-PR	SOIL	In house: Samples are fused with Sodium Carbonate / Potassium Carbonate flux.
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.
Methanolic Extraction of Soils - Ultra-trace.	ORG16-UT	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.
Tumbler Extraction of Solids - VIC EPA Screen	ORG17-EM	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.
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.
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for purging.

GHD



Melbourne Office Address

180 Lonsdale Street, Melbourne 3000

Telephone: 613 8687 8000 Fax: 613 8687 8111

Completion Date / Turnaround

Quote # / GHD Reference

Job Number <b>12685152</b>	GHD Contact	Laboratory: <b>ALS</b>
Project <b>APAM Hotel APRON SOUTH.</b>		Address: <b>2-4 Westall Rd Springvale</b>
GHD Project Manager [Redacted]	GHD Contact [Redacted]	Laboratory Contact [Redacted]
GHD PM email [Redacted]	GHD Contact email [Redacted]	

**COURIER AND LABORATORY INSTRUCTIONS:**  
 Sign white copy on receipt and release of samples.  
 Samples are to be delivered to the Laboratory Address.  
 On receipt of samples, the laboratory contact  
 to sign white copy and fax/email to GHD Contact.  
 On completion of analyses please return white  
 copy with results.  
 Pink copy is returned to the sampler once the  
 courier has signed for the samples.  
 E-mail results to the GHD Project Manager  
 and GHD Contact with the GHD Job Number in the e-mail subject line.  
 Note email format: firstname.lastname@ghd.com  
 Results to be provided in ESDAT compatible format

Sample I.D.	Date	Time	Composite Sample	Sample Matrix S: Soil SL: Sludge W: Water A: Air GW: Groundwater	J: soil jar B: bag V: vial G: glass bottle P: plastic bottle	Number	Volume (mL)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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TOTAL NUMBER OF SAMPLES:

41

GENERAL COMMENTS:

TOTAL NUMBER OF ESKIES:

3

SAMPLES/ESKY CHILLED (Y/N)

Y

## CUSTODY DETAILS:

	Name	Date/Time Received	Date/Time Relinquished
SAMPLER	[Redacted]		07/06/23 11:00am.
GHD SERVICE CENTRE			
COURIER	C LIP 189 12 PM		07/06/23
LABORATORY	APAM (Pm) 766, 12:00		

Environmental Division  
 Melbourne  
 Work Order Reference  
**EM2310246**



Telephone: +61-3-8646 9600



## CHAIN OF CUSTODY RECORD

Page \_\_\_\_ of \_\_\_\_

GHD



Melbourne Office Address

Completion Date / Turnaround

Quote # / GHD Reference

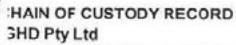
180 Lonsdale Street, Melbourne 3000

Telephone: 613 8687 8000 Fax: 613 8687 8111

Job Number <b>12605152</b>		GHD Contact		Laboratory: <b>ALS</b>		<b>COURIER AND LABORATORY INSTRUCTIONS:</b> Sign white copy on receipt and release of samples. Samples are to be delivered to the Laboratory Address. On receipt of samples, the laboratory contact to sign white copy and fax/email to GHD Contact. On completion of analyses please return white copy with results. Pink copy is returned to the sampler once the courier has signed for the samples. E-mail results to the GHD Project Manager and GHD Contact with the GHD Job Number in the e-mail subject line. Note email format: firstname.lastname@ghd.com Results to be provided in ESDAT compatible format																			
Project <b>APAM Hotel Apron South.</b>		GHD Contact <b>Adrian Liu</b>		Address: <b>2-4 westall road springvale</b>																					
GHD Project Manager [Redacted]		GHD Contact email [Redacted]		Laboratory Contact [Redacted]																					
GHD PM email [Redacted]		GHD Contact email [Redacted]		Container <b>Analyses Required</b>																					
Sample I.D.	Date	Time	Composite Sample	Sample Matrix S: Sol. SL: Sludge W: Water A: Air GW: Groundwater	Type J: soil jar B: bag V: vial G: glass bottle P: plastic bottle	Number	Volume (mL)																		
HAS-BH05-0.5	06/06/23			S	1xP																				
HAS-BH05-1.0				S	1xP1xJ																				
HAS-BH06-0.0				S	1xP																				
HAS-BH06-0.2				S	1xP1xJ																				
HAS-BH06-0.5				S	1xP1xJ																				
HAS-BH06-1.6				S	1xP1xJ																				
TOTAL NUMBER OF SAMPLES: <b>41</b>		<b>41</b>		GENERAL COMMENTS:																					
TOTAL NUMBER OF ESKIES:		<b>3</b>																							
SAMPLES/ESKY CHILLED? <b>Y</b>		<b>Y</b>																							
CUSTODY DETAILS:																									
Name		Date/Time Received								Date/Time Relinquished															
SAMPLER		[Redacted]								07/06/23 1100 Am															
GHD SERVICE CENTRE																									
COURIER		CLIF 189 12pm								07/06/23															
LABORATORY		[Redacted]								Am 7/6 1240															







Level 8 - 180 Lonsdale Street, Melbourne, VIC 3000  
Telephone: 613 8687 8000

STANDARD

Quote	GHD STANDARD RATES
-------	--------------------

Page of

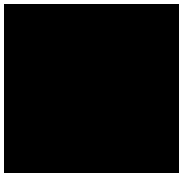
GHD PM email

<b>Containers</b>
-------------------

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

### SAMPLE COMMENTS

Date/Time	Location	Activity	Remarks
10/10/2019 10:00	...	...	...
10/10/2019 10:05	...	...	...
10/10/2019 10:10	...	...	...
10/10/2019 10:15	...	...	...
10/10/2019 10:20	...	...	...
10/10/2019 10:25	...	...	...
10/10/2019 10:30	...	...	...
10/10/2019 10:35	...	...	...
10/10/2019 10:40	...	...	...
10/10/2019 10:45	...	...	...
10/10/2019 10:50	...	...	...
10/10/2019 10:55	...	...	...
10/10/2019 11:00	...	...	...
10/10/2019 11:05	...	...	...
10/10/2019 11:10	...	...	...
10/10/2019 11:15	...	...	...
10/10/2019 11:20	...	...	...
10/10/2019 11:25	...	...	...
10/10/2019 11:30	...	...	...
10/10/2019 11:35	...	...	...
10/10/2019 11:40	...	...	...
10/10/2019 11:45	...	...	...
10/10/2019 11:50	...	...	...
10/10/2019 11:55	...	...	...
10/10/2019 12:00	...	...	...
10/10/2019 12:05	...	...	...
10/10/2019 12:10	...	...	...
10/10/2019 12:15	...	...	...
10/10/2019 12:20	...	...	...
10/10/2019 12:25	...	...	...
10/10/2019 12:30	...	...	...
10/10/2019 12:35	...	...	...
10/10/2019 12:40	...	...	...
10/10/2019 12:45	...	...	...
10/10/2019 12:50	...	...	...
10/10/2019 12:55	...	...	...
10/10/2019 13:00	...	...	...
10/10/2019 13:05	...	...	...
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10/10/2019 13:45	...	...	...
10/10/2019 13:50	...	...	...
10/10/2019 13:55	...	...	...
10/10/2019 14:00	...	...	...
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10/10/2019 14:45	...	...	...
10/10/2019 14:50	...	...	...
10/10/2019 14:55	...	...	...
10/10/2019 15:00	...	...	...
10/10/2019 15:05	...	...	...
10/10/2019 15:10	...	...	...
10/10/2019 15:15	...	...	...
10/10/2019 15:20	...	...	...
10/10/2019 15:25	...	...	...
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10/10/2019 15:45	...	...	...
10/10/2019 15:50	...	...	...
10/10/2019 15:55	...	...	...
10/10/2019 16:00	...	...	...
10/10/2019 16:05	...	...	...
10/10/2019 16:10	...	...	...
10/10/2019 16:15	...	...	...
10/10/2019 16:20	...	...	...
10/10/2019 16:25	...	...	...
10/10/2019 16:30	...	...	...
10/10/2019 16:35	...	...	...
10/10/2019 16:40	...	...	...
10/10/2019 16:45	...	...	...
10/10/2019 16:50	...	...	...
10/10/2019 16:55	...	...	...
10/10/2019 17:00	...	...	...
10/10/2019 17:05	...	...	...



## SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : EM2310246

Client : GHD PTY LTD  
Contact :   
Address : LEVEL 8, 180 LONSDALE ST  
MELBOURNE VIC, AUSTRALIA 3001

Laboratory : Environmental Division Melbourne  
Contact :   
Address : 4 Westall Rd Springvale VIC Australia  
3171

E-mail :   
Telephone :   
Facsimile :

E-mail :   
Telephone :   
Facsimile :

Project : 12605152  
Order number : ----

Page : 1 of 3  
Quote number : EM2021GHDSE0057 (MEBQ/005/21  
(Vic Only, Primary))

C-O-C number : ----  
Site :   
Sampler :

QC Level : NEPM 2013 B3 & ALS QC Standard

### Dates

Date Samples Received : 07-Jun-2023 12:40  
Client Requested Due : 15-Jun-2023  
Date :

Issue Date : 09-Jun-2023  
Scheduled Reporting Date : **15-Jun-2023**

### Delivery Details

Mode of Delivery : Carrier  
No. of coolers/boxes : 3  
Receipt Detail :

Security Seal : Intact.  
Temperature : 6.1°C - Ice present  
No. of samples received / analysed : 26 / 16

### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **Analytical work for this work order will be conducted at ALS Springvale.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

## Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exists.

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)	SOIL - P-301 EPA 1828.2 Table 2 Solid Suite (EM)	SOIL - S-26 8 metals/TRH/BTEX/PAH
EM2310246-001	06-Jun-2023 00:00	HAS-BH03-0.0		✓	✓		
EM2310246-002	06-Jun-2023 00:00	HAS-BH03-0.5		✓	✓		✓
EM2310246-003	06-Jun-2023 00:00	HAS-BH03-1.0		✓	✓		✓
EM2310246-004	06-Jun-2023 00:00	HAS-BH03-2.0	✓				
EM2310246-006	06-Jun-2023 00:00	HAS-BH02-0.0		✓	✓		
EM2310246-007	06-Jun-2023 00:00	HAS-BH02-0.3		✓	✓		✓
EM2310246-008	06-Jun-2023 00:00	HAS-BH02-0.5		✓	✓		✓
EM2310246-009	06-Jun-2023 00:00	HAS-BH02-1.0	✓				
EM2310246-010	06-Jun-2023 00:00	HAS-BH02-2.0	✓				
EM2310246-011	06-Jun-2023 00:00	HAS-BH04-0.0	✓				
EM2310246-012	06-Jun-2023 00:00	HAS-BH04-0.2		✓	✓	✓	
EM2310246-013	06-Jun-2023 00:00	HAS-BH04-0.5		✓	✓		✓
EM2310246-014	06-Jun-2023 00:00	HAS-BH04-1.0	✓				
EM2310246-015	06-Jun-2023 00:00	HAS-BH04-2.0	✓				
EM2310246-016	06-Jun-2023 00:00	HAS-BH05-0.0	✓				
EM2310246-017	06-Jun-2023 00:00	HAS-BH05-0.2		✓	✓		✓
EM2310246-018	06-Jun-2023 00:00	HAS-BH05-0.5		✓	✓		✓
EM2310246-019	06-Jun-2023 00:00	HAS-BH05-1.0	✓				
EM2310246-020	06-Jun-2023 00:00	HAS-BH06-0.0	✓				
EM2310246-021	06-Jun-2023 00:00	HAS-BH06-0.2		✓	✓	✓	
EM2310246-022	06-Jun-2023 00:00	HAS-BH06-0.5		✓	✓		✓
EM2310246-023	06-Jun-2023 00:00	HAS-BH06-1.6	✓				
EM2310246-025	06-Jun-2023 00:00	TRIP BLANK 1		✓	✓		
EM2310246-026	06-Jun-2023 00:00	TRIP BLANK 2		✓	✓		



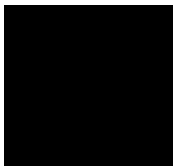
Matrix: <b>WATER</b>			WATER - W-18 TRH(C6 - C9)/BTEXN	WATER - W-26T TRH/BTEXN/PAH/Total 8 Metals
Laboratory sample ID	Sampling date / time	Sample ID		
EM2310246-005	06-Jun-2023 00:00	RS01		✓
EM2310246-024	06-Jun-2023 00:00	TB02	✓	

## Proactive Holding Time Report

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

### Requested Deliverables

[illegible]



## CERTIFICATE OF ANALYSIS

**Work Order** : EM2310246  
**Client** : GHD PTY LTD  
**Contact** :   
**Address** : LEVEL 8, 180 LONSDALE ST  
MELBOURNE VIC, AUSTRALIA 3001  
**Telephone** :   
**Project** : 12605152  
**Order number** : ----  
**C-O-C number** : ----  
**Sampler** :   
**Site** :   
**Quote number** : MEBQ/005/21 (Vic Only, Primary)  
**No. of samples received** : 26  
**No. of samples analysed** : 14

**Page** : 1 of 28  
**Laboratory** : Environmental Division Melbourne  
**Contact** :   
**Address** : 4 Westall Rd Springvale VIC Australia 3171  
**Telephone** :   
**Date Samples Received** : 07-Jun-2023 12:40  
**Date Analysis Commenced** : 08-Jun-2023  
**Issue Date** : 15-Jun-2023 18:28



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
	VOC Section Supervisor	Melbourne Inorganics, Springvale, VIC
	VOC Section Supervisor	Melbourne Organics, Springvale, VIC
	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
	2IC Organic Chemist	Melbourne Inorganics, Springvale, VIC
	2IC Organic Chemist	Melbourne Organics, Springvale, VIC
	LCMS Coordinator	Melbourne Organics, Springvale, VIC

## General Comments

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

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

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

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

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

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

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

- EP075 (SIM): Where reported, 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.
- 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.
- EP074-UT: 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.
- EP074-UT: Where reported, Sum of trichlorobenzenes is the sum of the reported concentrations of 1,2,3-Trichlorobenzene and 1,2,4-Trichlorobenzene, and 1,3,5-Trichlorobenzene at or above the LOR.
- EP236: Tributyl tin is reported as Tributyl tin oxide under the conservative assumption that all of the measured Tributyl tin is present as Tributyl tin oxide.
- EK030SF : EM2310246 # Poor matrix spike recovery for cyanide amenable to chlorination due to matrix effects.
- EP231X: Sample EM2310184\_003 Poor matrix spike recovery for (10:2 FTS) due to matrix effects.
- 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.





























































## Automated Guideline Comparison Report

Work Order : **EM2310246**

Client : **GHD PTY LTD**

Contact : [REDACTED]

Address : LEVEL 8, 180 LONSDALE ST  
MELBOURNE VIC, AUSTRALIA 3001

E-mail : [REDACTED]

Telephone : [REDACTED]

Facsimile : [REDACTED]

Project : 12605152

Order number : ----

C-O-C number : ----

No. of samples received : 26

No. of samples analysed : 14

Page : 1 of 32

Laboratory : Environmental Division Melbourne

Address : 4 Westall Rd Springvale VIC Australia 3171

E-mail : [REDACTED]

Telephone : + [REDACTED]

Facsimile : + [REDACTED]

Date Received : 07-Jun-2023 12:40

Date Analysed : 08-Jun-2023

Date Issued : 15-Jun-2023 18:17

Quote number : MEBQ/005/21 (Vic Only, Primary)

### General Comments

Only results in the 'Analytical Results' section have been compared to the guideline.

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

*Summary of Thresholds Reached or Exceeded*

Results for all samples detailed in this report are below the upper threshold limits for Fill Material.

*Results for all samples detailed in this report are below the upper threshold limits for Fill Material.*



























































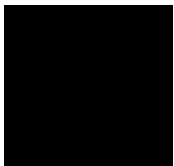












## QUALITY CONTROL REPORT

Work Order : EM2310246

Page : 1 of 31

Client : GHD PTY LTD

Laboratory : Environmental Division Melbourne

Contact : [REDACTED]

Contact : [REDACTED]

Address : LEVEL 8, 180 LONSDALE ST  
MELBOURNE VIC, AUSTRALIA 3001

Address : 4 Westall Rd Springvale VIC Australia 3171

Telephone : [REDACTED]

Telephone : [REDACTED]

Project : 12605152

Date Samples Received : 07-Jun-2023

Order number : ----

Date Analysis Commenced : 08-Jun-2023

C-O-C number : ----

Issue Date : 15-Jun-2023

Sampler : [REDACTED]

Site :

Quote number : MEBQ/005/21 (Vic Only, Primary)

No. of samples received : 26

No. of samples analysed : 14



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

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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

### Signatories

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

Signatories	Position	Accreditation Category
[REDACTED]	VOC Section Supervisor	Melbourne Inorganics, Springvale, VIC
	VOC Section Supervisor	Melbourne Organics, Springvale, VIC
	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
	2IC Organic Chemist	Melbourne Inorganics, Springvale, VIC
	2IC Organic Chemist	Melbourne Organics, Springvale, VIC
	LCMS Coordinator	Melbourne Organics, Springvale, VIC

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 5103596)									
EM2310184-015	Anonymous	EG005T: Lead	7439-92-1	5	mg/kg	31	40	25.3	No Limit
EM2310184-001	Anonymous	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	170	150	8.1	0% - 50%
		EG005T: Chromium	7440-47-3	2	mg/kg	16	15	8.9	No Limit
		EG005T: Molybdenum	7439-98-7	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	34	27	22.7	0% - 50%
		EG005T: Silver	7440-22-4	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Antimony	7440-36-0	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	36	29	20.5	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	7	6	0.0	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	46	42	10.1	No Limit
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.0	No Limit
EM2310184-015	Anonymous	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	140	150	0.0	0% - 50%
		EG005T: Chromium	7440-47-3	2	mg/kg	36	32	10.3	0% - 50%
		EG005T: Molybdenum	7439-98-7	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	30	32	8.3	0% - 50%
		EG005T: Silver	7440-22-4	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Antimony	7440-36-0	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	6	11	55.3	No Limit

Page : 3 of 31  
 Work Order : EM2310246  
 Client : GHD PTY LTD  
 Project : 12605152

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: 5103596) - continued									
EM2310184-015	Anonymous	EG005T: Copper	7440-50-8	5	mg/kg	21	21	0.0	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	75	95	23.6	0% - 50%
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.0	No Limit
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 5103597)									
EM2310246-018	HAS-BH05-0.5	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	30	40	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	33	33	0.0	0% - 50%
		EG005T: Molybdenum	7439-98-7	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	23	25	6.7	0% - 50%
		EG005T: Silver	7440-22-4	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Antimony	7440-36-0	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	9	10	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	13	13	0.0	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	11	12	0.0	No Limit
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.0	No Limit
EM2310249-061	Anonymous	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	50	50	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	7	8	0.0	No Limit
		EG005T: Molybdenum	7439-98-7	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	13	14	7.9	No Limit
		EG005T: Silver	7440-22-4	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Antimony	7440-36-0	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	60	58	3.5	0% - 50%
		EG005T: Lead	7439-92-1	5	mg/kg	6	8	39.8	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	52	53	0.0	0% - 50%
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.0	No Limit
EP095: Ethylenediamine Tetraacetic Acid (EDTA) (QC Lot: 5107956)									
EM2310246-012	HAS-BH04-0.2	EP095: Ethylenediamine tetraacetic acid (EDTA)	60-00-04	10	mg/kg	<10	<10	0.0	No Limit
EP236: Dichlorophenoxyacetic Acid (2,4-D) and Tributyltin Oxide (TBTO) (QC Lot: 5106817)									
EM2310246-012	HAS-BH04-0.2	EP236: 2,4-D	94-75-7	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
		EP236: Tributyltin oxide	56-35-9	0.01	mg/kg	<0.01	<0.01	0.0	No Limit
EM2310431-005	Anonymous	EP236: 2,4-D	94-75-7	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
		EP236: Tributyltin oxide	56-35-9	0.01	mg/kg	<0.01	<0.01	0.0	No Limit

Page : 4 of 31  
 Work Order : EM2310246  
 Client : GHD PTY LTD  
 Project : 12605152

Sub-Matrix: <b>SOIL</b>				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
<b>EA001: pH in soil using 0.01M CaCl extract (QC Lot: 5106842)</b>									
EM2310184-001	Anonymous	EA001: pH (CaCl2)	----	0.1	pH Unit	10.4	10.4	0.0	0% - 20%
EM2310223-005	Anonymous	EA001: pH (CaCl2)	----	0.1	pH Unit	8.2	8.2	0.0	0% - 20%
<b>EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5104496)</b>									
EM2310006-001	Anonymous	EA055: Moisture Content	----	0.1	%	6.5	7.6	15.8	0% - 20%
EM2310184-013	Anonymous	EA055: Moisture Content	----	0.1	%	38.4	39.0	1.4	0% - 20%
<b>EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5104497)</b>									
EM2310246-008	HAS-BH02-0.5	EA055: Moisture Content	----	0.1	%	3.3	3.7	10.9	No Limit
EM2310375-004	Anonymous	EA055: Moisture Content	----	0.1	%	13.1	12.2	7.0	0% - 50%
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 5103595)</b>									
EM2310184-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EM2310184-015	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 5103598)</b>									
EM2310246-018	HAS-BH05-0.5	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EM2310249-061	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.1	0.0	No Limit
<b>EG048: Hexavalent Chromium (Alkaline Digest) (QC Lot: 5103619)</b>									
EM2309859-024	Anonymous	EG048G: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EM2310184-008	Anonymous	EG048G: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EK026SF: Total CN by Segmented Flow Analyser (QC Lot: 5107944)</b>									
EM2310329-002	Anonymous	EK026SF: Total Cyanide	57-12-5	1	mg/kg	<1	<1	0.0	No Limit
EM2310246-012	HAS-BH04-0.2	EK026SF: Total Cyanide	57-12-5	1	mg/kg	<1	<1	0.0	No Limit
<b>EK030: Cyanide Amenable to Chlorination (QC Lot: 5107945)</b>									
EM2310246-012	HAS-BH04-0.2	EK030SF: Cyanide amenable to chlorination	----	1	mg/kg	<1	<1	0.0	No Limit
<b>EK040T: Fluoride Total (QC Lot: 5103621)</b>									
EM2310184-001	Anonymous	EK040T: Fluoride	16984-48-8	40	mg/kg	400	400	0.0	0% - 50%
<b>EP010: Formaldehyde (QC Lot: 5107957)</b>									
EM2310246-012	HAS-BH04-0.2	EP010: Formaldehyde	50-00-0	2	mg/kg	<2	<2	0.0	No Limit
<b>EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 5104434)</b>									
EM2310184-001	Anonymous	EP066-EM: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EM2310382-017	Anonymous	EP066-EM: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 5103430)</b>									
EM2310184-001	Anonymous	EP074-UT: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP074-UT: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074-UT: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074-UT: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
		EP074-UT: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074-UT: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

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 Work Order : EM2310246  
 Client : GHD PTY LTD  
 Project : 12605152

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 (%)
EP074B: Oxygenated Compounds (QC Lot: 5103430)									
EM2310184-001	Anonymous	EP074-UT: 2-Butanone (MEK)	78-93-3	1	mg/kg	<1	<1	0.0	No Limit
EP074H: Naphthalene (QC Lot: 5103430)									
EM2310184-001	Anonymous	EP074-UT: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
EP074I: Volatile Halogenated Compounds (QC Lot: 5103430)									
EM2310184-001	Anonymous	EP074-UT: 1.1-Dichloroethene	75-35-4	0.01	mg/kg	<0.01	<0.01	0.0	No Limit
		EP074-UT: cis-1.2-Dichloroethene	156-59-2	0.01	mg/kg	<0.01	<0.01	0.0	No Limit
		EP074-UT: 1.1.1-Trichloroethane	71-55-6	0.01	mg/kg	<0.01	<0.01	0.0	No Limit
		EP074-UT: Carbon Tetrachloride	56-23-5	0.01	mg/kg	<0.01	<0.01	0.0	No Limit
		EP074-UT: 1.1.1.2-Tetrachloroethane	630-20-6	0.01	mg/kg	<0.01	<0.01	0.0	No Limit
		EP074-UT: 1.2.4-Trichlorobenzene	120-82-1	0.01	mg/kg	<0.01	<0.01	0.0	No Limit
		EP074-UT: 1.3.5-Trichlorobenzene	108-70-3	0.01	mg/kg	<0.01	<0.01	0.0	No Limit
		EP074-UT: 1.2.3-Trichlorobenzene	87-61-6	0.01	mg/kg	<0.01	<0.01	0.0	No Limit
		EP074-UT: Vinyl chloride	75-01-4	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP074-UT: trans-1.2-Dichloroethene	156-60-5	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP074-UT: Chloroform	67-66-3	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP074-UT: 1.2-Dichloroethane	107-06-2	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP074-UT: Trichloroethene	79-01-6	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP074-UT: Tetrachloroethene	127-18-4	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP074-UT: 1.1.2.2-Tetrachloroethane	79-34-5	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP074-UT: Hexachlorobutadiene	87-68-3	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP074-UT: Chlorobenzene	108-90-7	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP074-UT: 1.4-Dichlorobenzene	106-46-7	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP074-UT: 1.2-Dichlorobenzene	95-50-1	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP074-UT: 1.1.2-Trichloroethane	79-00-5	0.04	mg/kg	<0.04	<0.04	0.0	No Limit
		EP074-UT: Methylene chloride	75-09-2	0.4	mg/kg	<0.4	<0.4	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 5103540)									
EM2310166-013	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	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			205-82-3						
		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



Sub-Matrix: <b>SOIL</b>				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: 5103540) - continued									
EM2310166-013	Anonymous	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
EM2310375-002	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
		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	2.4	2.8	15.6	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	3.4	4.0	17.7	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	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			205-82-3						
		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
EP075A: Phenolic Compounds (Halogenated) (QC Lot: 5104432)									
EM2310184-001	Anonymous	EP075-EM: 2-Chlorophenol	95-57-8	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: 2,4-Dichlorophenol	120-83-2	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: 2,4,5-Trichlorophenol	95-95-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP075-EM: 2,4,6-Trichlorophenol	88-06-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
EM2310382-017	Anonymous	EP075-EM: 2-Chlorophenol	95-57-8	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: 2,4-Dichlorophenol	120-83-2	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: 2,4,5-Trichlorophenol	95-95-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP075-EM: 2,4,6-Trichlorophenol	88-06-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
EP075A: Phenolic Compounds (Non-halogenated) (QC Lot: 5104432)									
EM2310184-001	Anonymous	EP075-EM: Phenol	108-95-2	1	mg/kg	<1	<1	0.0	No Limit
		EP075-EM: 2-Methylphenol	95-48-7	1	mg/kg	<1	<1	0.0	No Limit
		EP075-EM: 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075-EM: 2-Nitrophenol	88-75-5	1	mg/kg	<1	<1	0.0	No Limit
		EP075-EM: 2,4-Dimethylphenol	105-67-9	1	mg/kg	<1	<1	0.0	No Limit
		EP075-EM: 2,4-Dinitrophenol	51-28-5	5	mg/kg	<5	<5	0.0	No Limit
		EP075-EM: 4-Nitrophenol	100-02-7	5	mg/kg	<5	<5	0.0	No Limit
		EP075-EM: 2-Methyl-4,6-dinitrophenol	8071-51-0	5	mg/kg	<5	<5	0.0	No Limit
		EP075-EM: Dinoseb	88-85-7	5	mg/kg	<5	<5	0.0	No Limit
EP075-EM: 2-Cyclohexyl-4,6-Dinitrophenol	131-89-5	5	mg/kg	<5	<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 (%)
EP075A: Phenolic Compounds (Non-halogenated) (QC Lot: 5104432) - continued									
EM2310382-017	Anonymous	EP075-EM: Phenol	108-95-2	1	mg/kg	<1	<1	0.0	No Limit
		EP075-EM: 2-Methylphenol	95-48-7	1	mg/kg	<1	<1	0.0	No Limit
		EP075-EM: 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075-EM: 2-Nitrophenol	88-75-5	1	mg/kg	<1	<1	0.0	No Limit
		EP075-EM: 2,4-Dimethylphenol	105-67-9	1	mg/kg	<1	<1	0.0	No Limit
		EP075-EM: 2,4-Dinitrophenol	51-28-5	5	mg/kg	<5	<5	0.0	No Limit
		EP075-EM: 4-Nitrophenol	100-02-7	5	mg/kg	<5	<5	0.0	No Limit
		EP075-EM: 2-Methyl-4,6-dinitrophenol	8071-51-0	5	mg/kg	<5	<5	0.0	No Limit
		EP075-EM: Dinoseb	88-85-7	5	mg/kg	<5	<5	0.0	No Limit
	EP075-EM: 2-Cyclohexyl-4,6-Dinitrophenol	131-89-5	5	mg/kg	<5	<5	0.0	No Limit	
EP075B: Polynuclear Aromatic Hydrocarbons (QC Lot: 5104432)									
EM2310184-001	Anonymous	EP075-EM: Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Indeno(1,2,3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Dibenzo(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	1	mg/kg	<1.0	<1.0	0.0	No Limit
EM2310382-017	Anonymous	EP075-EM: Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Indeno(1,2,3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Dibenzo(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

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 Work Order : EM2310246  
 Client : GHD PTY LTD  
 Project : 12605152

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 (%)
EP075B: Polynuclear Aromatic Hydrocarbons (QC Lot: 5104432) - continued									
EM2310382-017	Anonymous	EP075-EM: Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: Benzo(b+j) & Benzo(k)fluoranthene	205-99-2	1	mg/kg	<1.0	<1.0	0.0	No Limit
			207-08-9						
EP075C: Phthalate Esters (QC Lot: 5104432)									
EM2310184-001	Anonymous	EP075-EM: bis(2-ethylhexyl) phthalate	117-81-7	0.5	mg/kg	<0.5	0.9	54.2	No Limit
EM2310382-017	Anonymous	EP075-EM: bis(2-ethylhexyl) phthalate	117-81-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075E: Nitroaromatics and Ketones (QC Lot: 5104432)									
EM2310184-001	Anonymous	EP075-EM: Nitrobenzene	98-95-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: 2,4-Dinitrotoluene	121-14-2	1	mg/kg	<1.0	<1.0	0.0	No Limit
EM2310382-017	Anonymous	EP075-EM: Nitrobenzene	98-95-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-EM: 2,4-Dinitrotoluene	121-14-2	1	mg/kg	<1.0	<1.0	0.0	No Limit
EP075I: Organochlorine Pesticides (QC Lot: 5104432)									
EM2310184-001	Anonymous	EP075-EM: alpha-BHC	319-84-6	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: Hexachlorobenzene (HCB)	118-74-1	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: beta-BHC	319-85-7	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: gamma-BHC	58-89-9	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: delta-BHC	319-86-8	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: Heptachlor	76-44-8	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: Aldrin	309-00-2	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: Heptachlor epoxide	1024-57-3	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: cis-Chlordane	5103-71-9	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: trans-Chlordane	5103-74-2	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: Endosulfan 1	959-98-8	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: Dieldrin	60-57-1	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: Endrin aldehyde	7421-93-4	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: Endrin	72-20-8	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: Endosulfan 2	33213-65-9	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: Endosulfan sulfate	1031-07-8	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: Methoxychlor	72-43-5	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: 4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP075-EM: 4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP075-EM: 4,4'-DDT	50-29-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
EM2310382-017	Anonymous	EP075-EM: alpha-BHC	319-84-6	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: Hexachlorobenzene (HCB)	118-74-1	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: beta-BHC	319-85-7	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: gamma-BHC	58-89-9	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: delta-BHC	319-86-8	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: Heptachlor	76-44-8	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: Aldrin	309-00-2	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: Heptachlor epoxide	1024-57-3	0.03	mg/kg	<0.03	<0.03	0.0	No Limit



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 Work Order : EM2310246  
 Client : GHD PTY LTD  
 Project : 12605152

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 (%)
EP075I: Organochlorine Pesticides (QC Lot: 5104432) - continued									
EM2310382-017	Anonymous	EP075-EM: cis-Chlordane	5103-71-9	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: trans-Chlordane	5103-74-2	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: Endosulfan 1	959-98-8	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: Dieldrin	60-57-1	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: Endrin aldehyde	7421-93-4	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: Endrin	72-20-8	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: Endosulfan 2	33213-65-9	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: Endosulfan sulfate	1031-07-8	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: Methoxychlor	72-43-5	0.03	mg/kg	<0.03	<0.03	0.0	No Limit
		EP075-EM: 4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP075-EM: 4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP075-EM: 4,4'-DDT	50-29-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5103430)									
EM2310184-001	Anonymous	EP074-UT: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5103495)									
EM2310246-002	HAS-BH03-0.5	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EM2310365-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5103541)									
EM2310166-013	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
EM2310375-002	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	6980	7800	11.1	0% - 20%
		EP071: C29 - C36 Fraction	----	100	mg/kg	880	990	11.4	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	1160	1280	10.3	0% - 20%
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5104433)									
EM2310184-001	Anonymous	EP071-EM: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071-EM: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071-EM: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EM2310382-017	Anonymous	EP071-EM: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071-EM: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071-EM: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5103430)									
EM2310184-001	Anonymous	EP074-UT: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
		EP074-UT: C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5103495)									
EM2310246-002	HAS-BH03-0.5	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EM2310365-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5103541)									
EM2310166-013	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit

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 Work Order : EM2310246  
 Client : GHD PTY LTD  
 Project : 12605152

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 Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5103541) - continued									
EM2310166-013	Anonymous	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
EM2310375-002	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	5560	6220	11.2	0% - 20%
		EP071: >C34 - C40 Fraction	----	100	mg/kg	500	560	11.3	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	3150	3510	10.8	0% - 20%
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5104433)									
EM2310184-001	Anonymous	EP071-EM: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071-EM: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071-EM: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EM2310382-017	Anonymous	EP071-EM: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071-EM: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071-EM: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080: BTEXN (QC Lot: 5103495)									
EM2310246-002	HAS-BH03-0.5	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
EM2310365-001	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: 5100525)									
EM2310184-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EM2310246-002	HAS-BH03-0.5	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

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 Client : GHD PTY LTD  
 Project : 12605152

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: 5104389)									
EM2310246-012	HAS-BH04-0.2	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	0.0044	0.0037	18.9	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EM2310416-020	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5100525)									
EM2310184-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTriDA)	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
EM2310246-002	HAS-BH03-0.5	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 (PFTriDA)	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5104389)									
EM2310246-012	HAS-BH04-0.2	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

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 Client : GHD PTY LTD  
 Project : 12605152

Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5104389) - continued									
EM2310246-012	HAS-BH04-0.2	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
EM2310416-020	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: 5100525)									
EM2310184-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EM2310246-002	HAS-BH03-0.5	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



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 Work Order : EM2310246  
 Client : GHD PTY LTD  
 Project : 12605152

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: 5100525) - continued									
EM2310246-002	HAS-BH03-0.5	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
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5104389)									
EM2310246-012	HAS-BH04-0.2	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
EM2310416-020	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: 5100525)									
EM2310184-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

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 Work Order : EM2310246  
 Client : GHD PTY LTD  
 Project : 12605152

Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5100525) - continued									
EM2310246-002	HAS-BH03-0.5	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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5104389)									
EM2310246-012	HAS-BH04-0.2	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
EM2310416-020	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5100525)									
EM2310184-001	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EM2310246-002	HAS-BH03-0.5	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5104389)									
EM2310246-012	HAS-BH04-0.2	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0044	0.0037	17.3	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0044	0.0037	17.3	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0044	0.0037	17.3	0% - 20%
EM2310416-020	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit



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 Work Order : EM2310246  
 Client : GHD PTY LTD  
 Project : 12605152

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5101853) - continued									
EM2310366-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	20	20	0.0	No Limit
EM2310271-007	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5100444)									
EM2310321-004	Anonymous	EP071: >C10 - C16 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5101853)									
EM2310366-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	20	20	0.0	No Limit
EM2310271-007	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 5101853)									
EM2310366-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	6	6	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
EM2310271-007	Anonymous	EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
		EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit



Method Blank (MB)	Laboratory Control Spike (LCS) Report
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Sub-Matrix: <b>SOIL</b>				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
Method: Compound	CAS Number	LOR	Unit		Result	Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High
<b>EP095: Ethylenediamine Tetraacetic Acid (EDTA) (QCLot: 5107956) - continued</b>								
EP095: Ethylenediamine tetraacetic acid (EDTA)	60-00-04	10	mg/kg	<10	50 mg/kg	97.6	70.0	130
<b>EP236: Dichlorophenoxyacetic Acid (2,4-D) and Tributyltin Oxide (TBTO) (QCLot: 5106817)</b>								
EP236: 2,4-D	94-75-7	0.001	mg/kg	<0.001	0.025 mg/kg	90.8	70.0	130
EP236: Tributyltin oxide	56-35-9	0.01	mg/kg	<0.01	0.229 mg/kg	106	70.0	130
<b>EA001: pH in soil using 0.01M CaCl extract (QCLot: 5106842)</b>								
EA001: pH (CaCl2)	----	----	pH Unit	----	4 pH Unit	101	98.8	101
				----	7 pH Unit	101	99.3	101
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 5103595)</b>								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.64 mg/kg	94.5	70.0	130
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 5103598)</b>								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.64 mg/kg	89.8	70.0	130
<b>EG048: Hexavalent Chromium (Alkaline Digest) (QCLot: 5103619)</b>								
EG048G: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	20 mg/kg	80.9	70.0	130
<b>EK026SF: Total CN by Segmented Flow Analyser (QCLot: 5107944)</b>								
EK026SF: Total Cyanide	57-12-5	1	mg/kg	<1	20 mg/kg	102	70.0	130
<b>EK030: Cyanide Amenable to Chlorination (QCLot: 5107945)</b>								
EK030SF: Cyanide amenable to chlorination	----	1	mg/kg	<1	40 mg/kg	111	70.0	130
<b>EK040T: Fluoride Total (QCLot: 5103621)</b>								
EK040T: Fluoride	16984-48-8	40	mg/kg	<40	334 mg/kg	104	93.1	107
<b>EP010: Formaldehyde (QCLot: 5107957)</b>								
EP010: Formaldehyde	50-00-0	2	mg/kg	<2	25 mg/kg	102	83.9	103
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 5104434)</b>								
EP066-EM: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	117	67.4	136
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 5103430)</b>								
EP074-UT: Benzene	71-43-2	0.2	mg/kg	<0.2	2.1 mg/kg	91.4	69.2	116
EP074-UT: Toluene	108-88-3	0.5	mg/kg	<0.5	2.1 mg/kg	96.8	67.7	116
EP074-UT: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2.1 mg/kg	93.5	66.6	115
EP074-UT: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4.2 mg/kg	93.6	65.2	112
EP074-UT: Styrene	100-42-5	0.5	mg/kg	<0.5	2.1 mg/kg	93.2	69.4	111
EP074-UT: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2.1 mg/kg	89.7	68.4	110
<b>EP074B: Oxygenated Compounds (QCLot: 5103430)</b>								
EP074-UT: 2-Butanone (MEK)	78-93-3	1	mg/kg	<1	1 mg/kg	83.1	70.0	130
<b>EP074H: Naphthalene (QCLot: 5103430)</b>								

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP074H: Naphthalene (QCLot: 5103430) - continued								
EP074-UT: Naphthalene	91-20-3	1	mg/kg	<1	0.6 mg/kg	86.3	72.3	114
EP074I: Volatile Halogenated Compounds (QCLot: 5103430)								
EP074-UT: Vinyl chloride	75-01-4	0.02	mg/kg	<0.02	0.1 mg/kg	123	47.0	138
EP074-UT: 1,1-Dichloroethene	75-35-4	0.01	mg/kg	<0.01	0.1 mg/kg	90.6	57.6	125
EP074-UT: Methylene chloride	75-09-2	0.4	mg/kg	<0.4	2.1 mg/kg	105	72.3	115
EP074-UT: trans-1,2-Dichloroethene	156-60-5	0.02	mg/kg	<0.02	0.1 mg/kg	102	60.5	122
EP074-UT: cis-1,2-Dichloroethene	156-59-2	0.01	mg/kg	<0.01	0.1 mg/kg	96.8	70.3	112
EP074-UT: Chloroform	67-66-3	0.02	mg/kg	<0.02	0.1 mg/kg	98.6	66.6	115
EP074-UT: 1,1,1-Trichloroethane	71-55-6	0.01	mg/kg	<0.01	0.1 mg/kg	104	64.4	122
EP074-UT: Carbon Tetrachloride	56-23-5	0.01	mg/kg	<0.01	0.1 mg/kg	104	58.4	127
EP074-UT: 1,2-Dichloroethane	107-06-2	0.02	mg/kg	<0.02	0.1 mg/kg	98.1	72.9	114
EP074-UT: Trichloroethene	79-01-6	0.02	mg/kg	<0.02	0.1 mg/kg	101	64.7	115
EP074-UT: 1,1,2-Trichloroethane	79-00-5	0.04	mg/kg	<0.04	0.1 mg/kg	92.2	72.6	116
EP074-UT: Tetrachloroethene	127-18-4	0.02	mg/kg	<0.02	0.1 mg/kg	104	60.0	119
EP074-UT: 1,1,1,2-Tetrachloroethane	630-20-6	0.01	mg/kg	<0.01	0.1 mg/kg	93.0	71.8	116
EP074-UT: 1,1,2,2-Tetrachloroethane	79-34-5	0.02	mg/kg	<0.02	0.1 mg/kg	84.0	66.1	116
EP074-UT: Hexachlorobutadiene	87-68-3	0.02	mg/kg	<0.02	0.1 mg/kg	100	39.8	128
EP074-UT: Chlorobenzene	108-90-7	0.02	mg/kg	<0.02	0.1 mg/kg	98.6	70.3	113
EP074-UT: 1,4-Dichlorobenzene	106-46-7	0.02	mg/kg	<0.02	0.1 mg/kg	99.4	62.6	113
EP074-UT: 1,2-Dichlorobenzene	95-50-1	0.02	mg/kg	<0.02	0.1 mg/kg	100.0	70.8	110
EP074-UT: 1,2,4-Trichlorobenzene	120-82-1	0.01	mg/kg	<0.01	0.1 mg/kg	81.4	48.4	120
EP074-UT: 1,3,5-Trichlorobenzene	108-70-3	0.01	mg/kg	<0.01	0.1 mg/kg	99.6	70.0	130
EP074-UT: 1,2,3-Trichlorobenzene	87-61-6	0.01	mg/kg	<0.01	0.1 mg/kg	72.5	70.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 5103540)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	3 mg/kg	97.8	85.7	123
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	3 mg/kg	88.1	81.0	123
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	3 mg/kg	100	83.6	120
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	3 mg/kg	92.5	81.3	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	3 mg/kg	97.5	79.4	123
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	3 mg/kg	105	81.7	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	3 mg/kg	103	78.3	124
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	3 mg/kg	104	79.9	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	3 mg/kg	97.4	76.9	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	3 mg/kg	108	80.9	130

Sub-Matrix: **SOIL**

Sub-Matrix: <b>SOIL</b>				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low      High	
Method: Compound	CAS Number	LOR	Unit	Result				
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 5103540) - continued</b>								
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	3 mg/kg	99.0	70.0	121
	205-82-3							
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	3 mg/kg	96.4	80.4	130
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	3 mg/kg	102	70.2	123
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	3 mg/kg	90.5	67.9	122
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	3 mg/kg	89.6	65.8	123
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	3 mg/kg	95.8	65.8	127
<b>EP075A: Phenolic Compounds (Halogenated) (QCLot: 5104432)</b>								
EP075-EM: 2-Chlorophenol	95-57-8	0.03	mg/kg	<0.03	2 mg/kg	102	74.5	126
EP075-EM: 2,4-Dichlorophenol	120-83-2	0.03	mg/kg	<0.03	2 mg/kg	104	72.7	126
EP075-EM: 2,4,5-Trichlorophenol	95-95-4	0.05	mg/kg	<0.05	2 mg/kg	107	73.3	134
EP075-EM: 2,4,6-Trichlorophenol	88-06-2	0.05	mg/kg	<0.05	2 mg/kg	106	72.4	128
<b>EP075A: Phenolic Compounds (Non-halogenated) (QCLot: 5104432)</b>								
EP075-EM: Phenol	108-95-2	1	mg/kg	<1	2 mg/kg	90.8	71.5	130
EP075-EM: 2-Methylphenol	95-48-7	1	mg/kg	<1	2 mg/kg	94.4	73.4	129
EP075-EM: 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	4 mg/kg	102	74.3	129
EP075-EM: 2-Nitrophenol	88-75-5	1	mg/kg	<1	2 mg/kg	110	70.9	133
EP075-EM: 2,4-Dimethylphenol	105-67-9	1	mg/kg	<1	2 mg/kg	108	71.8	132
EP075-EM: 2,4-Dinitrophenol	51-28-5	5	mg/kg	<5	10 mg/kg	131	41.0	156
EP075-EM: 4-Nitrophenol	100-02-7	5	mg/kg	<5	10 mg/kg	117	65.3	134
EP075-EM: 2-Methyl-4,6-dinitrophenol	8071-51-0	5	mg/kg	<5	10 mg/kg	127	43.6	128
EP075-EM: Dinoseb	88-85-7	5	mg/kg	<5	10 mg/kg	127	62.0	128
EP075-EM: 2-Cyclohexyl-4,6-Dinitrophenol	131-89-5	5	mg/kg	<5	10 mg/kg	125	34.5	137
<b>EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 5104432)</b>								
EP075-EM: Naphthalene	91-20-3	0.5	mg/kg	<0.5	2 mg/kg	96.6	73.0	131
EP075-EM: Acenaphthene	83-32-9	0.5	mg/kg	<0.5	2 mg/kg	89.6	76.3	130
EP075-EM: Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	2 mg/kg	106	72.0	135
EP075-EM: Fluorene	86-73-7	0.5	mg/kg	<0.5	2 mg/kg	100	74.4	131
EP075-EM: Phenanthrene	85-01-8	0.5	mg/kg	<0.5	2 mg/kg	95.4	73.3	130
EP075-EM: Anthracene	120-12-7	0.5	mg/kg	<0.5	2 mg/kg	100	78.4	127
EP075-EM: Fluoranthene	206-44-0	0.5	mg/kg	<0.5	2 mg/kg	101	75.3	132
EP075-EM: Pyrene	129-00-0	0.5	mg/kg	<0.5	2 mg/kg	97.0	75.4	130
EP075-EM: Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	2 mg/kg	98.0	69.6	133
EP075-EM: Chrysene	218-01-9	0.5	mg/kg	<0.5	2 mg/kg	95.1	75.0	133

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 5104432) - continued								
EP075-EM: Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	1	mg/kg	<1.0	4 mg/kg	110	75.8	133
EP075-EM: Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	2 mg/kg	125	65.1	130
EP075-EM: Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	2 mg/kg	119	72.1	134
EP075-EM: Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	2 mg/kg	122	72.9	135
EP075-EM: Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	2 mg/kg	112	71.3	134
EP075C: Phthalate Esters (QCLot: 5104432)								
EP075-EM: bis(2-ethylhexyl) phthalate	117-81-7	0.5	mg/kg	<0.5	2 mg/kg	127	70.0	130
EP075E: Nitroaromatics and Ketones (QCLot: 5104432)								
EP075-EM: 2,4-Dinitrotoluene	121-14-2	1	mg/kg	<1.0	2 mg/kg	103	70.0	130
EP075-EM: Nitrobenzene	98-95-3	0.5	mg/kg	<0.5	2 mg/kg	96.4	70.0	130
EP075I: Organochlorine Pesticides (QCLot: 5104432)								
EP075-EM: alpha-BHC	319-84-6	0.03	mg/kg	<0.03	2 mg/kg	98.0	71.0	129
EP075-EM: Hexachlorobenzene (HCB)	118-74-1	0.03	mg/kg	<0.03	2 mg/kg	92.1	74.8	126
EP075-EM: beta-BHC	319-85-7	0.03	mg/kg	<0.03	2 mg/kg	103	75.7	130
EP075-EM: gamma-BHC	58-89-9	0.03	mg/kg	<0.03	2 mg/kg	101	70.8	130
EP075-EM: delta-BHC	319-86-8	0.03	mg/kg	<0.03	2 mg/kg	98.4	76.5	134
EP075-EM: Heptachlor	76-44-8	0.03	mg/kg	<0.03	2 mg/kg	104	75.5	131
EP075-EM: Aldrin	309-00-2	0.03	mg/kg	<0.03	2 mg/kg	95.7	76.8	130
EP075-EM: Heptachlor epoxide	1024-57-3	0.03	mg/kg	<0.03	2 mg/kg	94.0	73.6	130
EP075-EM: cis-Chlordane	5103-71-9	0.03	mg/kg	<0.03	2 mg/kg	94.6	75.0	133
EP075-EM: trans-Chlordane	5103-74-2	0.03	mg/kg	<0.03	2 mg/kg	91.9	75.3	131
EP075-EM: Endosulfan 1	959-98-8	0.03	mg/kg	<0.03	2 mg/kg	94.6	69.4	134
EP075-EM: 4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	2 mg/kg	101	71.0	132
EP075-EM: Dieldrin	60-57-1	0.03	mg/kg	<0.03	2 mg/kg	99.2	78.0	133
EP075-EM: Endrin aldehyde	7421-93-4	0.03	mg/kg	<0.03	2 mg/kg	103	69.0	143
EP075-EM: Endrin	72-20-8	0.03	mg/kg	<0.03	2 mg/kg	79.3	55.7	145
EP075-EM: Endosulfan 2	33213-65-9	0.03	mg/kg	<0.03	2 mg/kg	98.2	71.4	135
EP075-EM: 4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	2 mg/kg	111	74.8	134
EP075-EM: Endosulfan sulfate	1031-07-8	0.03	mg/kg	<0.03	2 mg/kg	108	70.2	135
EP075-EM: 4,4'-DDT	50-29-3	0.05	mg/kg	<0.05	2 mg/kg	120	77.7	133
EP075-EM: Methoxychlor	72-43-5	0.03	mg/kg	<0.03	2 mg/kg	133	63.6	135
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5103430)								
EP074-UT: C6 - C9 Fraction	----	10	mg/kg	<10	39.6 mg/kg	89.1	61.1	119



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 Client : GHD PTY LTD  
 Project : 12605152

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 5103495)</b>								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	36 mg/kg	81.3	58.6	131
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 5103541)</b>								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	770 mg/kg	116	75.0	128
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	2860 mg/kg	104	82.0	123
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	1540 mg/kg	105	82.4	121
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 5104433)</b>								
EP071-EM: C10 - C14 Fraction	----	50	mg/kg	<50	770 mg/kg	112	74.4	129
EP071-EM: C15 - C28 Fraction	----	100	mg/kg	<100	2860 mg/kg	99.2	81.0	123
EP071-EM: C29 - C36 Fraction	----	100	mg/kg	<100	1540 mg/kg	104	81.8	121
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5103430)</b>								
EP074-UT: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	48.9 mg/kg	89.6	59.9	119
EP074-UT: C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	----	----	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5103495)</b>								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	45 mg/kg	87.2	59.3	128
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5103541)</b>								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	1170 mg/kg	99.8	77.0	130
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	3830 mg/kg	105	81.5	120
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	290 mg/kg	103	73.3	137
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5104433)</b>								
EP071-EM: >C10 - C16 Fraction	----	50	mg/kg	<50	1170 mg/kg	92.5	75.4	132
EP071-EM: >C16 - C34 Fraction	----	100	mg/kg	<100	3830 mg/kg	101	80.8	120
EP071-EM: >C34 - C40 Fraction	----	100	mg/kg	<100	290 mg/kg	80.0	73.3	136
<b>EP080: BTEXN (QCLot: 5103495)</b>								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	82.6	61.6	117
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	87.9	65.8	125
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	89.2	65.8	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	93.4	64.8	134
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	92.7	68.7	132
EP080: Naphthalene	91-20-3	1	mg/kg	<1	0.5 mg/kg	88.5	61.8	123
<b>EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5100525)</b>								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00111 mg/kg	90.4	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	98.2	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00114 mg/kg	93.5	67.0	130

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 Client : GHD PTY LTD  
 Project : 12605152

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5100525) - continued								
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	98.7	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	91.1	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00121 mg/kg	83.3	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5104389)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00111 mg/kg	74.7	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	87.8	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00114 mg/kg	92.1	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	104	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	96.2	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00121 mg/kg	88.2	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5100525)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	88.6	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.8	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.6	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.6	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.7	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.6	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.8	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.2	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.8	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.6	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	101	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5104389)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	72.0	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	83.3	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.3	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.1	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.8	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.3	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	73.4	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	76.6	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	74.2	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	108	69.0	133

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 Client : GHD PTY LTD  
 Project : 12605152

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5100525)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.9	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	96.4	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	98.3	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	92.8	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	109	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.9	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.1	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5104389)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	112	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	96.9	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	96.4	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	112	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	108	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	80.3	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.4	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5100525)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	98.8	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00119 mg/kg	102	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	104	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00121 mg/kg	85.8	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5104389)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	94.5	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00119 mg/kg	101	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	102	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00121 mg/kg	94.5	70.0	130
EP231P: PFAS Sums (QCLot: 5100525)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----



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 Project : 12605152

Sub-Matrix: <b>SOIL</b>				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result		LCS	Low	High
EP231P: PFAS Sums (QCLot: 5100525) - continued								
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231P: PFAS Sums (QCLot: 5104389)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
Method: Compound	CAS Number	LOR	Unit		Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
						LCS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 5101181)								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	108	89.2	115
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	106	86.4	115
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	103	86.9	112
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	103	86.9	111
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	105	88.3	112
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	102	87.9	113
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	109	86.7	117
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5103274)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	92.1	73.4	119
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 5100443)								
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	85.5	42.8	114
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	83.0	48.6	119
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	86.2	47.0	117
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	90.3	49.5	119
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	92.6	49.4	121
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	90.8	48.4	122
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	89.4	50.3	124
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	89.1	50.0	126
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	92.5	49.4	127
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	88.8	48.7	126
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	5 µg/L	86.4	54.5	134
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	94.6	56.1	134
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	83.1	55.6	135
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	86.9	54.4	126

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 5100443) - continued								
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	86.3	54.5	126
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	85.0	54.4	126
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5100444)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	4560 µg/L	87.4	47.2	122
EP071: C15 - C28 Fraction	----	100	µg/L	<100	16200 µg/L	81.6	52.9	131
EP071: C29 - C36 Fraction	----	50	µg/L	<50	8650 µg/L	85.9	50.4	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5101853)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	91.9	66.2	134
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5100444)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	6190 µg/L	81.3	49.1	125
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	22200 µg/L	81.4	51.6	128
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	1520 µg/L	79.4	47.2	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5101853)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	97.1	66.2	132
EP080: BTEXN (QCLot: 5101853)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	96.3	68.8	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	101	72.9	129
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	102	71.7	130
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	101	72.3	136
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	104	75.9	134
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	107	68.3	131

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				Matrix Spike (MS) Report			
				Spike Concentration	SpikeRecovery(%) MS	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number			Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5103596)							
EM2310184-002	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	88.8	78.0	124
		EG005T: Cadmium	7440-43-9	50 mg/kg	96.9	79.7	116
		EG005T: Chromium	7440-47-3	50 mg/kg	89.8	79.0	121
		EG005T: Copper	7440-50-8	250 mg/kg	104	80.0	120
		EG005T: Lead	7439-92-1	250 mg/kg	98.7	80.0	120

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5103596) - continued							
EM2310184-002	Anonymous	EG005T: Nickel	7440-02-0	50 mg/kg	92.4	78.0	120
		EG005T: Zinc	7440-66-6	250 mg/kg	92.7	80.0	120
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5103597)							
EM2310246-021	HAS-BH06-0.2	EG005T: Arsenic	7440-38-2	50 mg/kg	96.4	78.0	124
		EG005T: Cadmium	7440-43-9	50 mg/kg	94.2	79.7	116
		EG005T: Chromium	7440-47-3	50 mg/kg	79.4	79.0	121
		EG005T: Copper	7440-50-8	250 mg/kg	99.4	80.0	120
		EG005T: Lead	7439-92-1	250 mg/kg	94.0	80.0	120
		EG005T: Nickel	7440-02-0	50 mg/kg	92.7	78.0	120
		EG005T: Zinc	7440-66-6	250 mg/kg	89.5	80.0	120
EP095: Ethylenediamine Tetraacetic Acid (EDTA) (QCLot: 5107956)							
EM2310246-021	HAS-BH06-0.2	EP095: Ethylenediamine tetraacetic acid (EDTA)	60-00-04	50 mg/kg	100	70.0	130
EP236: Dichlorophenoxyacetic Acid (2,4-D) and Tributyltin Oxide (TBTO) (QCLot: 5106817)							
EM2310246-021	HAS-BH06-0.2	EP236: 2,4-D	94-75-7	0.025 mg/kg	95.8	70.0	130
		EP236: Tributyltin oxide	56-35-9	0.229 mg/kg	111	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5103595)							
EM2310184-002	Anonymous	EG035T: Mercury	7439-97-6	0.5 mg/kg	112	76.0	116
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5103598)							
EM2310246-021	HAS-BH06-0.2	EG035T: Mercury	7439-97-6	0.5 mg/kg	96.9	76.0	116
EG048: Hexavalent Chromium (Alkaline Digest) (QCLot: 5103619)							
EM2309859-026	Anonymous	EG048G: Hexavalent Chromium	18540-29-9	20 mg/kg	75.0	58.0	114
EM2309859-026	Anonymous	EG048G: Hexavalent Chromium	18540-29-9	20 mg/kg	83.4	58.0	114
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 5107944)							
EM2310184-005	Anonymous	EK026SF: Total Cyanide	57-12-5	20 mg/kg	72.8	70.0	130
EK030: Cyanide Amenable to Chlorination (QCLot: 5107945)							
EM2310246-021	HAS-BH06-0.2	EK030SF: Cyanide amenable to chlorination	----	40 mg/kg	# 139	70.0	130
EK040T: Fluoride Total (QCLot: 5103621)							
EM2310184-005	Anonymous	EK040T: Fluoride	16984-48-8	400 mg/kg	108	70.0	130
EP010: Formaldehyde (QCLot: 5107957)							
EM2310246-021	HAS-BH06-0.2	EP010: Formaldehyde	50-00-0	15 mg/kg	80.0	70.0	130
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 5104434)							
EM2310184-019	Anonymous	EP066-EM: Total Polychlorinated biphenyls	----	1 mg/kg	120	59.6	152
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 5103430)							
EM2310184-005	Anonymous	EP074-UT: Benzene	71-43-2	2 mg/kg	105	53.7	130
		EP074-UT: Toluene	108-88-3	2 mg/kg	101	55.1	124

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### Matrix Spike (MS) Report

				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP074I: Volatile Halogenated Compounds (QCLot: 5103430)							
EM2310184-005	Anonymous	EP074-UT: 1,1-Dichloroethene	75-35-4	2 mg/kg	125	38.4	145
		EP074-UT: Trichloroethene	79-01-6	2 mg/kg	111	48.1	128
		EP074-UT: Chlorobenzene	108-90-7	2 mg/kg	98.1	55.5	122
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 5103540)							
EM2310246-002	HAS-BH03-0.5	EP075(SIM): Acenaphthene	83-32-9	3 mg/kg	95.2	77.2	116
		EP075(SIM): Pyrene	129-00-0	3 mg/kg	99.1	65.5	136
EP075A: Phenolic Compounds (Halogenated) (QCLot: 5104432)							
EM2310184-005	Anonymous	EP075-EM: 2-Chlorophenol	95-57-8	3 mg/kg	118	44.0	143
EP075A: Phenolic Compounds (Non-halogenated) (QCLot: 5104432)							
EM2310184-005	Anonymous	EP075-EM: Phenol	108-95-2	3 mg/kg	100	44.2	134
		EP075-EM: 2-Nitrophenol	88-75-5	3 mg/kg	122	34.2	129
EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 5104432)							
EM2310184-005	Anonymous	EP075-EM: Acenaphthene	83-32-9	3 mg/kg	102	42.6	138
		EP075-EM: Pyrene	129-00-0	3 mg/kg	99.2	37.8	152
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5103430)							
EM2310184-005	Anonymous	EP074-UT: C6 - C9 Fraction	----	28 mg/kg	94.7	42.3	111
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5103495)							
EM2310375-002	Anonymous	EP080: C6 - C9 Fraction	----	28 mg/kg	55.9	33.4	124
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5103541)							
EM2310246-003	HAS-BH03-1.0	EP071: C10 - C14 Fraction	----	770 mg/kg	116	71.2	125
		EP071: C15 - C28 Fraction	----	2860 mg/kg	104	75.6	122
		EP071: C29 - C36 Fraction	----	1540 mg/kg	104	78.0	120
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5104433)							
EM2310184-010	Anonymous	EP071-EM: C10 - C14 Fraction	----	770 mg/kg	124	71.3	126
		EP071-EM: C15 - C28 Fraction	----	2860 mg/kg	109	75.1	123
		EP071-EM: C29 - C36 Fraction	----	1540 mg/kg	114	78.1	120
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5103430)							
EM2310184-005	Anonymous	EP074-UT: C6 - C10 Fraction	C6_C10	33 mg/kg	89.0	39.9	109
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5103495)							
EM2310375-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	33 mg/kg	48.7	30.8	120
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5103541)							
EM2310246-003	HAS-BH03-1.0	EP071: >C10 - C16 Fraction	----	1170 mg/kg	99.3	72.2	128
		EP071: >C16 - C34 Fraction	----	3830 mg/kg	105	76.5	119
		EP071: >C34 - C40 Fraction	----	290 mg/kg	102	66.8	138
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5104433)							

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 Client : GHD PTY LTD  
 Project : 12605152

Sub-Matrix: **SOIL**

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 Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5104433) - continued							
EM2310184-010	Anonymous	EP071-EM: >C10 - C16 Fraction	----	1170 mg/kg	102	71.5	130
		EP071-EM: >C16 - C34 Fraction	----	3830 mg/kg	111	76.9	119
		EP071-EM: >C34 - C40 Fraction	----	290 mg/kg	86.9	65.3	139
EP080: BTEXN (QCLot: 5103495)							
EM2310375-002	Anonymous	EP080: Benzene	71-43-2	2 mg/kg	58.5	54.4	127
		EP080: Toluene	108-88-3	2 mg/kg	73.7	57.1	131
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5100525)							
EM2310184-003	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00111 mg/kg	91.0	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00118 mg/kg	77.5	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00114 mg/kg	77.8	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	96.8	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	102	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00121 mg/kg	82.2	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5104389)							
EM2310416-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00111 mg/kg	81.0	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00118 mg/kg	89.7	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00114 mg/kg	87.0	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	99.6	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	86.2	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00121 mg/kg	93.5	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5100525)							
EM2310184-003	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	95.5	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	93.2	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	90.7	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	90.3	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	97.9	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	92.3	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	88.2	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	102	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	94.8	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	88.0	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	97.8	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5104389)							
EM2310416-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	84.3	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	95.4	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	81.3	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	85.5	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	88.9	69.0	133



### 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: 5104389) - continued							
EM2310416-001	Anonymous	EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	87.4	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	77.4	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	103	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	80.8	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	77.8	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	106	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5100525)							
EM2310184-003	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	80.2	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	90.4	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	81.6	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	99.4	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	90.8	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	74.2	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	# 48.6	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5104389)							
EM2310416-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	104	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	101	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	85.9	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	97.6	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	106	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	92.4	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	87.9	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5100525)							
EM2310184-003	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	90.0	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00119 mg/kg	87.2	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	90.8	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00121 mg/kg	# 68.6	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5104389)							

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Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5104389) - continued							
EM2310416-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	92.8	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00119 mg/kg	96.6	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	104	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00121 mg/kg	78.3	70.0	130
Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 5101181)							
EM2310221-081	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	102	82.0	123
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	102	81.8	123
		EG020A-T: Chromium	7440-47-3	1 mg/L	100	78.9	119
		EG020A-T: Copper	7440-50-8	1 mg/L	101	80.4	118
		EG020A-T: Lead	7439-92-1	1 mg/L	104	80.5	121
		EG020A-T: Nickel	7440-02-0	1 mg/L	99.9	80.0	118
		EG020A-T: Zinc	7440-66-6	1 mg/L	101	74.0	120
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5103274)							
EM2310246-005	RS01	EG035T: Mercury	7439-97-6	0.01 mg/L	102	70.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 5100443)							
EM2310321-005	Anonymous	EP075(SIM): Acenaphthene	83-32-9	5 µg/L	71.0	39.3	123
		EP075(SIM): Pyrene	129-00-0	5 µg/L	69.0	44.0	124
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5101853)							
EM2310271-007	Anonymous	EP080: C6 - C9 Fraction	----	280 µg/L	74.9	33.9	126
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5101853)							
EM2310271-007	Anonymous	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	74.0	34.0	122
EP080: BTEXN (QCLot: 5101853)							
EM2310271-007	Anonymous	EP080: Benzene	71-43-2	20 µg/L	89.9	56.3	133
		EP080: Toluene	108-88-3	20 µg/L	94.4	60.4	132



## QA/QC Compliance Assessment to assist with Quality Review

Work Order : EM2310246

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Client : GHD PTY LTD

Laboratory : Environmental Division Melbourne

Contact : [REDACTED]

Telephone : [REDACTED]

Project : 12605152

Date Samples Received : 07-Jun-2023

Site :

Issue Date : 15-Jun-2023

Sampler : [REDACTED]

No. of samples received : 26

Order number : ----

No. of samples analysed : 14

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

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

### Summary of Outliers

#### Outliers : Quality Control Samples

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

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- Matrix Spike outliers exist - please see following pages for full details.
- For all regular sample matrices, **NO** surrogate recovery outliers occur.

#### Outliers : Analysis Holding Time Compliance

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

#### Outliers : Frequency of Quality Control Samples

- Quality Control Sample Frequency Outliers exist - please see following pages for full details.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: SOIL

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EK030: Cyanide Amenable to Chlorination	EM2310246--021	HAS-BH06-0.2	Cyanide amenable to chlorination	----	139 %	70.0-130%	Recovery greater than upper data quality objective
EP231C: Perfluoroalkyl Sulfonamides	EM2310184--003	Anonymous	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	48.6 %	61.0-139%	Recovery less than lower data quality objective
EP231D: (n:2) Fluorotelomer Sulfonic Acids	EM2310184--003	Anonymous	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	68.6 %	70.0-130%	Recovery less than lower data quality objective

Outliers : Frequency of Quality Control Samples

Matrix: WATER

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Method	0				
Matrix Spikes (MS)					
TRH - Semivolatile Fraction	0	6	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

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

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

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

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

Matrix: SOIL

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis			
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EA001: pH in soil using 0.01M CaCl extract								
Soil Glass Jar - Unpreserved (EA001) HAS-BH04-0.2,	HAS-BH06-0.2	06-Jun-2023	13-Jun-2023	13-Jun-2023	✓	13-Jun-2023	13-Jun-2023	✓

Evaluation: ✖ = Holding time breach : ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)								
HDPE Soil Jar (EA055) HAS-BH02-0.0		06-Jun-2023	----	----	----	10-Jun-2023	20-Jun-2023	✓
Soil Glass Jar - Unpreserved (EA055) HAS-BH03-0.0, HAS-BH03-1.0, HAS-BH02-0.5, HAS-BH04-0.5, HAS-BH05-0.5, HAS-BH06-0.5	HAS-BH03-0.5, HAS-BH02-0.3, HAS-BH04-0.2, HAS-BH05-0.2, HAS-BH06-0.2,	06-Jun-2023	----	----	----	10-Jun-2023	20-Jun-2023	✓
EG005(ED093)T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved (EG005T) HAS-BH03-0.5, HAS-BH02-0.3, HAS-BH04-0.2, HAS-BH05-0.2, HAS-BH06-0.2,	HAS-BH03-1.0, HAS-BH02-0.5, HAS-BH04-0.5, HAS-BH05-0.5, HAS-BH06-0.5	06-Jun-2023	13-Jun-2023	03-Dec-2023	✓	13-Jun-2023	03-Dec-2023	✓
EG035T: Total Recoverable Mercury by FIMS								
Soil Glass Jar - Unpreserved (EG035T) HAS-BH03-0.5, HAS-BH02-0.3, HAS-BH04-0.2, HAS-BH05-0.2, HAS-BH06-0.2,	HAS-BH03-1.0, HAS-BH02-0.5, HAS-BH04-0.5, HAS-BH05-0.5, HAS-BH06-0.5	06-Jun-2023	13-Jun-2023	04-Jul-2023	✓	13-Jun-2023	04-Jul-2023	✓
EG048: Hexavalent Chromium (Alkaline Digest)								
Soil Glass Jar - Unpreserved (EG048G) HAS-BH04-0.2,	HAS-BH06-0.2	06-Jun-2023	10-Jun-2023	04-Jul-2023	✓	13-Jun-2023	17-Jun-2023	✓
EK026SF: Total CN by Segmented Flow Analyser								
Soil Glass Jar - Unpreserved (EK026SF) HAS-BH04-0.2,	HAS-BH06-0.2	06-Jun-2023	13-Jun-2023	20-Jun-2023	✓	14-Jun-2023	27-Jun-2023	✓
EK030: Cyanide Amenable to Chlorination								
Soil Glass Jar - Unpreserved (EK030SF) HAS-BH04-0.2,	HAS-BH06-0.2	06-Jun-2023	13-Jun-2023	20-Jun-2023	✓	15-Jun-2023	27-Jun-2023	✓
EK040T: Fluoride Total								
Soil Glass Jar - Unpreserved (EK040T) HAS-BH04-0.2,	HAS-BH06-0.2	06-Jun-2023	10-Jun-2023	04-Jul-2023	✓	14-Jun-2023	04-Jul-2023	✓
EP010: Formaldehyde								
Soil Glass Jar - Unpreserved (EP010) HAS-BH04-0.2,	HAS-BH06-0.2	06-Jun-2023	13-Jun-2023	03-Dec-2023	✓	13-Jun-2023	03-Dec-2023	✓
EP066: Polychlorinated Biphenyls (PCB)								
Soil Glass Jar - Unpreserved (EP066-EM) HAS-BH04-0.2,	HAS-BH06-0.2	06-Jun-2023	13-Jun-2023	20-Jun-2023	✓	13-Jun-2023	23-Jul-2023	✓

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP074A: Monocyclic Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved (EP074-UT) HAS-BH04-0.2,	HAS-BH06-0.2	06-Jun-2023	09-Jun-2023	13-Jun-2023	✓	10-Jun-2023	13-Jun-2023	✓
EP074B: Oxygenated Compounds								
Soil Glass Jar - Unpreserved (EP074-UT) HAS-BH04-0.2,	HAS-BH06-0.2	06-Jun-2023	09-Jun-2023	13-Jun-2023	✓	10-Jun-2023	13-Jun-2023	✓
EP074H: Naphthalene								
Soil Glass Jar - Unpreserved (EP074-UT) HAS-BH04-0.2,	HAS-BH06-0.2	06-Jun-2023	09-Jun-2023	13-Jun-2023	✓	10-Jun-2023	13-Jun-2023	✓
EP074I: Volatile Halogenated Compounds								
Soil Glass Jar - Unpreserved (EP074-UT) HAS-BH04-0.2,	HAS-BH06-0.2	06-Jun-2023	09-Jun-2023	13-Jun-2023	✓	10-Jun-2023	13-Jun-2023	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved (EP075(SIM)) HAS-BH03-0.5, HAS-BH02-0.3, HAS-BH04-0.5, HAS-BH05-0.5,	HAS-BH03-1.0, HAS-BH02-0.5, HAS-BH05-0.2, HAS-BH06-0.5	06-Jun-2023	13-Jun-2023	20-Jun-2023	✓	14-Jun-2023	23-Jul-2023	✓
EP075A: Phenolic Compounds (Halogenated)								
Soil Glass Jar - Unpreserved (EP075-EM) HAS-BH04-0.2,	HAS-BH06-0.2	06-Jun-2023	13-Jun-2023	20-Jun-2023	✓	13-Jun-2023	23-Jul-2023	✓
EP075A: Phenolic Compounds (Non-halogenated)								
Soil Glass Jar - Unpreserved (EP075-EM) HAS-BH04-0.2,	HAS-BH06-0.2	06-Jun-2023	13-Jun-2023	20-Jun-2023	✓	13-Jun-2023	23-Jul-2023	✓
EP075B: Polynuclear Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved (EP075-EM) HAS-BH04-0.2,	HAS-BH06-0.2	06-Jun-2023	13-Jun-2023	20-Jun-2023	✓	13-Jun-2023	23-Jul-2023	✓
EP075C: Phthalate Esters								
Soil Glass Jar - Unpreserved (EP075-EM) HAS-BH04-0.2,	HAS-BH06-0.2	06-Jun-2023	13-Jun-2023	20-Jun-2023	✓	13-Jun-2023	23-Jul-2023	✓
EP075E: Nitroaromatics and Ketones								
Soil Glass Jar - Unpreserved (EP075-EM) HAS-BH04-0.2,	HAS-BH06-0.2	06-Jun-2023	13-Jun-2023	20-Jun-2023	✓	13-Jun-2023	23-Jul-2023	✓
EP075I: Organochlorine Pesticides								
Soil Glass Jar - Unpreserved (EP075-EM) HAS-BH04-0.2,	HAS-BH06-0.2	06-Jun-2023	13-Jun-2023	20-Jun-2023	✓	13-Jun-2023	23-Jul-2023	✓

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Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved (EP074-UT) HAS-BH04-0.2,	HAS-BH06-0.2	06-Jun-2023	09-Jun-2023	13-Jun-2023	✓	10-Jun-2023	13-Jun-2023	✓
Soil Glass Jar - Unpreserved (EP080) HAS-BH03-0.5, HAS-BH02-0.3, HAS-BH04-0.5, HAS-BH05-0.5,	HAS-BH03-1.0, HAS-BH02-0.5, HAS-BH05-0.2, HAS-BH06-0.5	06-Jun-2023	10-Jun-2023	20-Jun-2023	✓	13-Jun-2023	20-Jun-2023	✓
Soil Glass Jar - Unpreserved (EP071) HAS-BH03-0.5, HAS-BH02-0.3, HAS-BH04-0.5, HAS-BH05-0.5,	HAS-BH03-1.0, HAS-BH02-0.5, HAS-BH05-0.2, HAS-BH06-0.5	06-Jun-2023	13-Jun-2023	20-Jun-2023	✓	13-Jun-2023	23-Jul-2023	✓
Soil Glass Jar - Unpreserved (EP071-EM) HAS-BH04-0.2,	HAS-BH06-0.2	06-Jun-2023	13-Jun-2023	20-Jun-2023	✓	14-Jun-2023	23-Jul-2023	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
Soil Glass Jar - Unpreserved (EP074-UT) HAS-BH04-0.2,	HAS-BH06-0.2	06-Jun-2023	09-Jun-2023	13-Jun-2023	✓	10-Jun-2023	13-Jun-2023	✓
Soil Glass Jar - Unpreserved (EP080) HAS-BH03-0.5, HAS-BH02-0.3, HAS-BH04-0.5, HAS-BH05-0.5,	HAS-BH03-1.0, HAS-BH02-0.5, HAS-BH05-0.2, HAS-BH06-0.5	06-Jun-2023	10-Jun-2023	20-Jun-2023	✓	13-Jun-2023	20-Jun-2023	✓
Soil Glass Jar - Unpreserved (EP071) HAS-BH03-0.5, HAS-BH02-0.3, HAS-BH04-0.5, HAS-BH05-0.5,	HAS-BH03-1.0, HAS-BH02-0.5, HAS-BH05-0.2, HAS-BH06-0.5	06-Jun-2023	13-Jun-2023	20-Jun-2023	✓	13-Jun-2023	23-Jul-2023	✓
Soil Glass Jar - Unpreserved (EP071-EM) HAS-BH04-0.2,	HAS-BH06-0.2	06-Jun-2023	13-Jun-2023	20-Jun-2023	✓	14-Jun-2023	23-Jul-2023	✓
EP080: BTEXN								
Soil Glass Jar - Unpreserved (EP080) HAS-BH03-0.5, HAS-BH02-0.3, HAS-BH04-0.5, HAS-BH05-0.5,	HAS-BH03-1.0, HAS-BH02-0.5, HAS-BH05-0.2, HAS-BH06-0.5	06-Jun-2023	10-Jun-2023	20-Jun-2023	✓	13-Jun-2023	20-Jun-2023	✓
EP095: Ethylenediamine Tetraacetic Acid (EDTA)								
Soil Glass Jar - Unpreserved (EP095) HAS-BH04-0.2,	HAS-BH06-0.2	06-Jun-2023	13-Jun-2023	20-Jun-2023	✓	13-Jun-2023	23-Jul-2023	✓

Matrix: SOIL

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis			
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X) HAS-BH03-0.0, HAS-BH03-1.0, HAS-BH02-0.3, HAS-BH04-0.5, HAS-BH05-0.5, HAS-BH03-0.5, HAS-BH02-0.0, HAS-BH02-0.5, HAS-BH05-0.2, HAS-BH06-0.5	06-Jun-2023	08-Jun-2023	03-Dec-2023	✓	09-Jun-2023	18-Jul-2023	✓	
HDPE Soil Jar (EP231X) HAS-BH04-0.2, HAS-BH06-0.2	06-Jun-2023	10-Jun-2023	03-Dec-2023	✓	13-Jun-2023	20-Jul-2023	✓	
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X) HAS-BH03-0.0, HAS-BH03-1.0, HAS-BH02-0.3, HAS-BH04-0.5, HAS-BH05-0.5, HAS-BH03-0.5, HAS-BH02-0.0, HAS-BH02-0.5, HAS-BH05-0.2, HAS-BH06-0.5	06-Jun-2023	08-Jun-2023	03-Dec-2023	✓	09-Jun-2023	18-Jul-2023	✓	
HDPE Soil Jar (EP231X) HAS-BH04-0.2, HAS-BH06-0.2	06-Jun-2023	10-Jun-2023	03-Dec-2023	✓	13-Jun-2023	20-Jul-2023	✓	
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X) HAS-BH03-0.0, HAS-BH03-1.0, HAS-BH02-0.3, HAS-BH04-0.5, HAS-BH05-0.5, HAS-BH03-0.5, HAS-BH02-0.0, HAS-BH02-0.5, HAS-BH05-0.2, HAS-BH06-0.5	06-Jun-2023	08-Jun-2023	03-Dec-2023	✓	09-Jun-2023	18-Jul-2023	✓	
HDPE Soil Jar (EP231X) HAS-BH04-0.2, HAS-BH06-0.2	06-Jun-2023	10-Jun-2023	03-Dec-2023	✓	13-Jun-2023	20-Jul-2023	✓	
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X) HAS-BH03-0.0, HAS-BH03-1.0, HAS-BH02-0.3, HAS-BH04-0.5, HAS-BH05-0.5, HAS-BH03-0.5, HAS-BH02-0.0, HAS-BH02-0.5, HAS-BH05-0.2, HAS-BH06-0.5	06-Jun-2023	08-Jun-2023	03-Dec-2023	✓	09-Jun-2023	18-Jul-2023	✓	
HDPE Soil Jar (EP231X) HAS-BH04-0.2, HAS-BH06-0.2	06-Jun-2023	10-Jun-2023	03-Dec-2023	✓	13-Jun-2023	20-Jul-2023	✓	

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Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis			
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EP231P: PFAS Sums								
HDPE Soil Jar (EP231X) HAS-BH03-0.0, HAS-BH03-1.0, HAS-BH02-0.3, HAS-BH04-0.5, HAS-BH05-0.5,	HAS-BH03-0.5, HAS-BH02-0.0, HAS-BH02-0.5, HAS-BH05-0.2, HAS-BH06-0.5	06-Jun-2023	08-Jun-2023	03-Dec-2023	✓	09-Jun-2023	18-Jul-2023	✓
HDPE Soil Jar (EP231X) HAS-BH04-0.2,	HAS-BH06-0.2	06-Jun-2023	10-Jun-2023	03-Dec-2023	✓	13-Jun-2023	20-Jul-2023	✓
EP236: Dichlorophenoxyacetic Acid (2,4-D) and Tributyltin Oxide (TBTO)								
Soil Glass Jar - Unpreserved (EP236) HAS-BH04-0.2,	HAS-BH06-0.2	06-Jun-2023	13-Jun-2023	20-Jun-2023	✓	14-Jun-2023	23-Jul-2023	✓

Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T) RS01	06-Jun-2023	09-Jun-2023	03-Dec-2023	✓	09-Jun-2023	03-Dec-2023	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T) RS01	06-Jun-2023	---	---	---	13-Jun-2023	04-Jul-2023	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM)) RS01	06-Jun-2023	09-Jun-2023	13-Jun-2023	✓	10-Jun-2023	19-Jul-2023	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071) RS01	06-Jun-2023	09-Jun-2023	13-Jun-2023	✓	09-Jun-2023	19-Jul-2023	✓
Amber VOC Vial - Sulfuric Acid (EP080) RS01, TB02	06-Jun-2023	09-Jun-2023	20-Jun-2023	✓	09-Jun-2023	20-Jun-2023	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071) RS01	06-Jun-2023	09-Jun-2023	13-Jun-2023	✓	09-Jun-2023	19-Jul-2023	✓
Amber VOC Vial - Sulfuric Acid (EP080) RS01, TB02	06-Jun-2023	09-Jun-2023	20-Jun-2023	✓	09-Jun-2023	20-Jun-2023	✓
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080) RS01, TB02	06-Jun-2023	09-Jun-2023	20-Jun-2023	✓	09-Jun-2023	20-Jun-2023	✓



## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **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)							
2,4-D and Tributyltin Oxide (TBTO) by LCMSMS	EP236	2	12	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Cyanide Amenable to Chlorination (Segmented Flow Analyser)	EK030SF	1	10	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Ethylenediamine tetraacetic acid (EDTA) by GCMS	EP095	1	9	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Formaldehyde	EP010	1	9	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Hexavalent Chromium by Alkaline Digestion and DA Finish	EG048G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055	4	35	11.43	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	17	11.76	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PCB - VIC EPA 448.3 Screen	EP066-EM	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	29	13.79	10.00	✓	NEPM 2013 B3 & ALS QC Standard
pH in soil using a 0.01M CaCl2 extract	EA001	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds - Waste Classification	EP075-EM	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Fluoride	EK040T	1	9	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	4	40	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	5	40	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071-EM	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds - Ultra-trace	EP074-UT	1	7	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
2,4-D and Tributyltin Oxide (TBTO) by LCMSMS	EP236	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Cyanide Amenable to Chlorination (Segmented Flow Analyser)	EK030SF	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Ethylenediamine tetraacetic acid (EDTA) by GCMS	EP095	1	9	11.11	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Formaldehyde	EP010	1	9	11.11	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Hexavalent Chromium by Alkaline Digestion and DA Finish	EG048G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PCB - VIC EPA 448.3 Screen	EP066-EM	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	29	6.90	5.00	✓	NEPM 2013 B3 & ALS QC Standard
pH in soil using a 0.01M CaCl2 extract	EA001	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds - Waste Classification	EP075-EM	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Fluoride	EK040T	1	9	11.11	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard

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 Control Samples (LCS) - Continued							
TRH - Semivolatile Fraction	EP071	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071-EM	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds - Ultra-trace	EP074-UT	1	7	14.29	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
2,4-D and Tributyltin Oxide (TBTO) by LCMSMS	EP236	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Cyanide Amenable to Chlorination (Segmented Flow Analyser)	EK030SF	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Ethylenediamine tetraacetic acid (EDTA) by GCMS	EP095	1	9	11.11	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Formaldehyde	EP010	1	9	11.11	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Hexavalent Chromium by Alkaline Digestion and DA Finish	EG048G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PCB - VIC EPA 448.3 Screen	EP066-EM	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	29	6.90	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds - Waste Classification	EP075-EM	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Fluoride	EK040T	1	9	11.11	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071-EM	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds - Ultra-trace	EP074-UT	1	7	14.29	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
2,4-D and Tributyltin Oxide (TBTO) by LCMSMS	EP236	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Cyanide Amenable to Chlorination (Segmented Flow Analyser)	EK030SF	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Ethylenediamine tetraacetic acid (EDTA) by GCMS	EP095	1	9	11.11	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Formaldehyde	EP010	1	9	11.11	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Hexavalent Chromium by Alkaline Digestion and DA Finish	EG048G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PCB - VIC EPA 448.3 Screen	EP066-EM	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	29	6.90	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds - Waste Classification	EP075-EM	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Fluoride	EK040T	1	9	11.11	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071-EM	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard



Matrix: **SOIL** Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification .

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
Analytical Methods		QC	Regular	Actual	Expected	Evaluation	
Matrix Spikes (MS) - Continued							
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds - Ultra-trace	EP074-UT	1	7	14.29	5.00	✔	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER** Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification .

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
Analytical Methods		QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	5	20.00	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-MS - Suite A	EG020A-T	1	7	14.29	10.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	6	16.67	10.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	13	15.38	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	5	20.00	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-MS - Suite A	EG020A-T	1	7	14.29	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	6	16.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	13	7.69	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	5	20.00	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-MS - Suite A	EG020A-T	1	7	14.29	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	6	16.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	13	7.69	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	5	20.00	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-MS - Suite A	EG020A-T	1	7	14.29	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	6	0.00	5.00	✖	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	13	7.69	5.00	✔	NEPM 2013 B3 & ALS QC Standard

## Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
pH in soil using a 0.01M CaCl <sub>2</sub> extract	EA001	SOIL	In house: Referenced to Rayment and Lyons 4B3 (mod.) or 4B4 (mod.) 10 g of soil is mixed with 50 mL of 0.01M CaCl <sub>2</sub> and tumbled end over end for 1 hour. pH is measured from the continuous suspension. This method is compliant with NEPM Schedule B(3).
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 (SnCl <sub>2</sub> ) (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 SnCl <sub>2</sub> 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)
Hexavalent Chromium by Alkaline Digestion and DA Finish	EG048G	SOIL	In house: Referenced to USEPA SW846, Method 3060. Hexavalent chromium is extracted by alkaline digestion. The digest is determined by photometrically by automatic discrete analyser, following pH adjustment. The instrument uses colour development using dephenylcarbazide. Each run of samples is measured against a five-point calibration curve. This method is compliant with NEPM Schedule B(3)
Total Cyanide by Segmented Flow Analyser	EK026SF	SOIL	In house: Referenced to APHA 4500-CN C / ASTM D7511 / ISO 14403. Caustic leachates of soil samples are introduced into an automated segmented flow analyser. Complex bound cyanide is decomposed in a continuously flowing stream, at a pH of 3.8, by the effect of UV light. A UV-B lamp (312 nm) and a decomposition spiral of borosilicate glass are used to filter out UV light with a wavelength of less than 290 nm thus preventing the conversion of thiocyanate into cyanide. The hydrogen cyanide present at a pH of 3.8 is separated by gas dialysis. The hydrogen cyanide is then determined photometrically, based on the reaction of cyanide with chloramine-T to form cyanogen chloride. This then reacts with 4-pyridine carboxylic acid and 1,3-dimethylbarbituric acid to give a red colour which is measured at 600 nm. This method is compliant with NEPM Schedule B(3).
Cyanide Amenable to Chlorination (Segmented Flow Analyser)	EK030SF	SOIL	In house: Referenced to APHA 4500 - CN- G. The sample is leached in alkali solution and pretreated by contact with Chlorine (as hypochlorite) prior to determination of Total Cyanide. The measured parameter is the difference between Total Cyanide determined on an untreated sample and Total Cyanide determined post-chlorination. This method is compliant with NEPM Schedule B(3).
Total Fluoride	EK040T	SOIL	(In-house) Total fluoride is determined by ion specific electrode (ISE) in a solution obtained after a Sodium Carbonate / Potassium Carbonate fusion dissolution.
Formaldehyde	EP010	SOIL	In house: Referenced to ASTM D 6303-98. Determined on 1:5 soil / water extracts by colourimetry using NASH reagent. The Hantzsch reaction method is based on the reaction of acetylacetone with formaldehyde in the presence of excess ammonium acetate to form a coloured compound.

Analytical Methods	Method	Matrix	Method Descriptions
PCB - VIC EPA 448.3 Screen	EP066-EM	SOIL	In house: Referenced to USEPA SW 846 - 8270 Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point 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).
TRH - Semivolatile Fraction	EP071-EM	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40.
Volatile Organic Compounds - Ultra-trace	EP074-UT	SOIL	In house: Referenced to USEPA SW 846 - 8260 Extracts are analysed by Purge and Trap, Capillary GC/MS in partial SIM/Scan mode. Quantification is by comparison against an established multi-point calibration curves. This method is compliant with NEPM Schedule B(3).
Volatile Organic Compounds - Ultra-trace - Summations	EP074-UT-SUM	SOIL	Summation of MAHs and VHCs
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)
Semivolatile Organic Compounds - Waste Classification	EP075-EM	SOIL	In house: Referenced to USEPA SW 846 - 8270 Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique 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.
Ethylenediamine tetraacetic acid (EDTA) by GCMS	EP095	SOIL	In house: Referenced to DIN EN ISO 16588. The esterified derivative of EDTA from an aliquot of a 1:5 soil:water extract is analysed by GCMS in Selected Ion Monitoring (SIM) mode. This technique is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.
2,4-D and Tributyltin Oxide (TBTO) by LCMSMS	EP236	SOIL	In house: soils are solvent extracted. The extract is analysed by LC-Electrospray-MS-MS, Negative Mode using MRM. Quantification by internal standardisation. Results for Tributyltin expressed as Tributyltin Oxide (TBTO).
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> 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).



Analytical Methods	Method	Matrix	Method Descriptions
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015 The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM Schedule B(3)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS in SIM Mode 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	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM Schedule B(3)
Preparation Methods	Method	Matrix	Method Descriptions
NaOH leach for CN in Soils	CN-PR	SOIL	In house: APHA 4500 CN. Samples are extracted by end-over-end tumbling with NaOH.
pH in soil using a 0.01M CaCl <sub>2</sub> extract	EA001-PR	SOIL	In house: Referenced to Rayment and Lyons 4B1, 10 g of soil is mixed with 50 mL of 0.01M CaCl <sub>2</sub> and tumbled end over end for 1 hour. pH is measured from the continuous suspension. This method is compliant with NEPM Schedule B(3).
Alkaline digestion for Hexavalent Chromium	EG048PR	SOIL	In house: Referenced to USEPA SW846, Method 3060A.
Total Fluoride	EK040T-PR	SOIL	In house: Samples are fused with Sodium Carbonate / Potassium Carbonate flux.
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of reagent grade water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.
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).
Extraction of solids for 2,4-D and TBTO	EP236-PR	SOIL	In house: 2g of homogenised sample is extracted with alkaline solvent. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE)
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.
Methanolic Extraction of Soils - Ultra-trace.	ORG16-UT	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, Na <sub>2</sub> SO <sub>4</sub> 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.
Tumbler Extraction of Solids - VIC EPA Screen	ORG17-EM	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na <sub>2</sub> SO <sub>4</sub> 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.
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.



Preparation Methods	Method	Matrix	Method Descriptions
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for purging.

## Rebatch

**Client / Client code:** GHDSER

Project: 12605152

**Project Manger:**

Date /time sample rec: 26/05/2023 10:15

Date/time Instructions rec: 11/07/2023 14:15

**Due date:** Tuesday, 18 July 2023

Due date surcharge: STANDARD

CS Contact:

Additional Information:

Report recipients as per previous work order and the person requesting this analysis

Environmental Division

Melbourne

Work Order Reference

Work Order Reference  
**EM2312534**



Telephone : + 51-3-8549 9600

[illegible]



[Redacted]

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Hi [Redacted]

May I please request leachate analysis (ASLP pH neutral) for PFAS (EP231 – short suite/12 analytes) on the following 11 samples?

Could you please tell me if there is an additional cost to completing the same leachate analysis in unbuffered solution, in addition to the above?

GHD reference no. 12605152

Field ID	Sample date
AAN-BH01_0.1	25/05/2023
AAN-BH01_0.5	25/05/2023
AAN-BH03_0.5	25/05/2023
AAN-BH04_0.1	25/05/2023
AAN-BH04_0.5	25/05/2023
HAS-BH04_0.2	06/06/2023
HAS-BH04_0.5	06/06/2023
HAS-BH05_0.2	06/06/2023
HAS-BH05_0.5	06/06/2023
HAS-BH06_0.2	06/06/2023
HAS-BH06_0.5	06/06/2023

Thanks for you help! Looking forward to hearing from you.

Warm regards

[Redacted]

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## SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : EM2312534

Client : GHD PTY LTD  
Contact :   
Address : LEVEL 8, 180 LONSDALE ST  
MELBOURNE VIC, AUSTRALIA 3001

Laboratory : Environmental Division Melbourne  
Contact :   
Address : 4 Westall Rd Springvale VIC Australia  
3171

E-mail :   
Telephone :   
Facsimile :

E-mail :   
Telephone :   
Facsimile :

Project : 12605152  
Order number : 12605152

Page : 1 of 3  
Quote number : EM2021GHDSE0057 (MEBQ/005/21  
(Vic Only, Primary))  
QC Level : NEPM 2013 B3 & ALS QC Standard

C-O-C number : ----  
Site : ----  
Sampler :

### Dates

Date Samples Received : 26-May-2023 10:15  
Client Requested Due : 18-Jul-2023  
Date

Issue Date : 11-Jul-2023  
Scheduled Reporting Date : **18-Jul-2023**

### Delivery Details

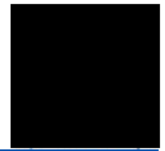
Mode of Delivery : Samples On Hand  
No. of coolers/boxes : ----  
Receipt Detail :

Security Seal : Not Available  
Temperature : ----  
No. of samples received / analysed : 11 / 11

### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **Analytical work for this work order will be conducted at ALS Springvale.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.





## Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exists.

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EN60-Dia-P Deionised Water Leach - Plastic Leaching Vessel	SOIL - EP231 PFAS - Short Suite (12 analytes)
EM2312534-001	25-May-2023 00:00	AAN-BH01-0.1	✓	✓
EM2312534-002	25-May-2023 00:00	AAN-BH01-0.5	✓	✓
EM2312534-003	25-May-2023 00:00	AAN-BH04-0.1	✓	✓
EM2312534-004	25-May-2023 00:00	AAN-BH04-0.5	✓	✓
EM2312534-005	25-May-2023 00:00	AAN-BH03-0.5	✓	✓
EM2312534-006	06-Jun-2023 00:00	HAS-BH04-0.2	✓	✓
EM2312534-007	06-Jun-2023 00:00	HAS-BH04-0.5	✓	✓
EM2312534-008	06-Jun-2023 00:00	HAS-BH05-0.2	✓	✓
EM2312534-009	06-Jun-2023 00:00	HAS-BH05-0.5	✓	✓
EM2312534-010	06-Jun-2023 00:00	HAS-BH06-0.2	✓	✓
EM2312534-011	06-Jun-2023 00:00	HAS-BH06-0.5	✓	✓

## Proactive Holding Time Report

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



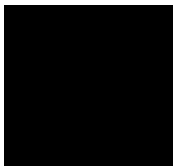
*Requested Deliverables*

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## CERTIFICATE OF ANALYSIS

**Work Order** : EM2312534  
**Client** : GHD PTY LTD  
**Contact** :   
**Address** : LEVEL 8, 180 LONSDALE ST  
MELBOURNE VIC, AUSTRALIA 3001  
**Telephone** :   
**Project** : 12605152  
**Order number** : 12605152  
**C-O-C number** : ----  
**Sampler** :   
**Site** : ----  
**Quote number** : MEBQ/005/21 (Vic Only, Primary)  
**No. of samples received** : 11  
**No. of samples analysed** : 11

**Page** : 1 of 9  
**Laboratory** : Environmental Division Melbourne  
**Contact** :   
**Address** : 4 Westall Rd Springvale VIC Australia 3171  
**Telephone** :   
**Date Samples Received** : 26-May-2023 10:15  
**Date Analysis Commenced** : 12-Jul-2023  
**Issue Date** : 14-Jul-2023 15:06



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
	Metals Team Leader	Melbourne Inorganics, Springvale, VIC
	LCMS Coordinator	Melbourne Organics, Springvale, VIC

Page : 2 of 9  
Work Order : EM2312534  
Client :  
Project :

## General Comments

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

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

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

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

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

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

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

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- EP231X: Poor matrix spike recovery for sample EM2312534-002 due to sample matrix interference.
- EN60-Dia-P: EM2312534 #001-#011 Due to limited sample for leach analysis, a scaled down amount of 50g into 1000mL was used.
- 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.
- EN60-DI: Where leachable PFAS analysis is requested, centrifugation rather than pressure filtration is used as the default approach for removal of particulates, in line with AS 4439.3.









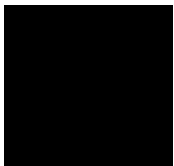






Surrogate Control Limits

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



# QUALITY CONTROL REPORT

Work Order	: EM2312534	Page	: 1 of 5
Client	: GHD PTY LTD	Laboratory	: Environmental Division Melbourne
Contact	: [REDACTED]	Contact	: [REDACTED]
Address	: LEVEL 8, 180 LONSDALE ST MELBOURNE VIC, AUSTRALIA 3001	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: [REDACTED]	Telephone	: [REDACTED]
Project	: 12605152	Date Samples Received	: 26-May-2023
Order number	: 12605152	Date Analysis Commenced	: 12-Jul-2023
C-O-C number	: ----	Issue Date	: 14-Jul-2023
Sampler	: [REDACTED]		
Site	: ----		
Quote number	: MEBQ/005/21 (Vic Only, Primary)		
No. of samples received	: 11		
No. of samples analysed	: 11		



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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

### Signatories

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

Signatories	Position	Accreditation Category
[REDACTED]	Metals Team Leader	Melbourne Inorganics, Springvale, VIC
	LCMS Coordinator	Melbourne Organics, Springvale, VIC

General Comments

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

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

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

- Key :
- Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot

CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

RPD = Relative Percentage Difference

# = Indicates failed QC

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5172864)									
EM2312534-001	AAN-BH01-0.1	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.02	0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EM2312534-011	HAS-BH06-0.5	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.02	0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5172864)									
EM2312534-001	AAN-BH01-0.1	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EM2312534-011	HAS-BH06-0.5	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5172864)									
EM2312534-001	AAN-BH01-0.1	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5172864) - continued									
EM2312534-001	AAN-BH01-0.1	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EM2312534-011	HAS-BH06-0.5	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5172864)									
EM2312534-001	AAN-BH01-0.1	EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.02	0.01	66.7	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.02	0.01	66.7	No Limit
EM2312534-011	HAS-BH06-0.5	EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.02	0.01	66.7	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.02	0.01	66.7	No Limit

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

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

Sub-Matrix: <b>SOIL</b>				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result		LCS	Low	High
EN60-DI: Bottle Leaching Procedure - Inorganics/PFAS (Plastic Vessel) (QCLot: 5171303)								
EN60-DIa-P: Final pH	----	0.1	pH Unit	6.8	----	----	----	----

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result		LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5172864)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.222 µg/L	91.0	72.0	130
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.228 µg/L	85.9	68.0	131
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	85.3	65.0	140
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5172864)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	88.1	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	90.0	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	91.1	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	89.1	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	91.5	71.0	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5172864)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.234 µg/L	97.5	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.238 µg/L	95.7	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	81.3	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.242 µg/L	87.6	70.0	130
EP231P: PFAS Sums (QCLot: 5172864)								
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

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

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
				Concentration	MS	Low	High
Laboratory sample ID	Sample ID	Method: Compound	CAS Number				

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5172864)							
EM2312534-002	AAN-BH01-0.5	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.222 µg/L	89.1	72.0	130
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.228 µg/L	95.6	68.0	131
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	89.8	65.0	140
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5172864)							
EM2312534-002	AAN-BH01-0.5	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	92.2	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	93.0	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	93.4	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	91.2	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	95.6	71.0	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5172864)							
EM2312534-002	AAN-BH01-0.5	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	103	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.238 µg/L	96.8	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	96.7	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.242 µg/L	# 48.0	70.0	130





## QA/QC Compliance Assessment to assist with Quality Review

Work Order : EM2312534

Page : 1 of 5

Client : GHD PTY LTD

Laboratory : Environmental Division Melbourne

Contact : [REDACTED]

Telephone : [REDACTED]

Project : 12605152

Date Samples Received : 26-May-2023

Site : ----

Issue Date : 14-Jul-2023

Sampler : [REDACTED]

No. of samples received : 11

Order number : 12605152

No. of samples analysed : 11

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

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

### Summary of Outliers

#### Outliers : Quality Control Samples

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

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- Matrix Spike outliers exist - please see following pages for full details.
- For all regular sample matrices, **NO** surrogate recovery outliers occur.

#### Outliers : Analysis Holding Time Compliance

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

#### Outliers : Frequency of Quality Control Samples

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

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: WATER

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP231D: (n:2) Fluorotelomer Sulfonic Acids	EM2312534--002	AAN-BH01-0.5	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	48.0 %	70.0-130%	Recovery less than lower data quality objective

Analysis Holding Time Compliance

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

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

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

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

Matrix: SOIL

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EN60-DI: Bottle Leaching Procedure - Inorganics/PFAS (Plastic Vessel)							
Non-Volatile Leach: 180 day HT (e.g. PFAS, metals ex.Hg) (EN60-DIa-P) HAS-BH04-0.2, HAS-BH05-0.2, HAS-BH06-0.2,	06-Jun-2023	13-Jul-2023	03-Dec-2023	✔	---	---	---
Non-Volatile Leach: 180 day HT (e.g. PFAS, metals ex.Hg) (EN60-DIa-P) AAN-BH01-0.1, AAN-BH04-0.1, AAN-BH03-0.5	25-May-2023	13-Jul-2023	21-Nov-2023	✔	---	---	---

Matrix: WATER

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis			
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
AAN-BH01-0.1,	AAN-BH01-0.5,	13-Jul-2023	14-Jul-2023	09-Jan-2024	✔	14-Jul-2023	09-Jan-2024	✔
AAN-BH04-0.1,	AAN-BH04-0.5,							
AAN-BH03-0.5,	HAS-BH04-0.2,							
HAS-BH04-0.5,	HAS-BH05-0.2,							
HAS-BH05-0.5,	HAS-BH06-0.2,							
HAS-BH06-0.5								

10

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

### 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	
Method Blanks (MB)							
Deionised Water Leach - Plastic Leaching Vessel	EN60-Dia-P	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	11	18.18	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Deionised Water Leach - Plastic Leaching Vessel	EN60-D1a-P	SOIL	In house QWI-EN/60 referenced to AS4439.3 Preparation of Leachates
Solid Phase Extraction (SPE) for PFAS in water	ORG72	SOIL	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

## Rebatch

Environmental Division  
Melbourne

Work Order Reference  
**EM2313141**



Telephone : + 61-3-8549 9600

**Client / Client code:** GHDSER

Project: APAM APRON DEVELOPMENT 12605152

Project Manager: [REDACTED]

Date /time sample rec: 26/05/2023 0:00

Date/time Instructions rec: Thursday, 20 July 2023 3:19 PM

**Due date:** Thursday, 27 July 2023

Due date surcharge: **STANDARD**

CS Contact:

Additional Information:

Please add reports for all recipients as per main work order and client who requested.

[illegible]

Scott Huett

---

From:  
Sent:  
To:  
Cc:  
Subject:

Hi [REDACTED]

Thank you for helping out.  
The original work order number for these samples is EM2309440.

Warm regards

[REDACTED]

**GHD**

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180 Lonsdale Street, Melbourne VIC 3000 Australia

→ The Power of Commitment

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Please consider the environment before printing this email

[REDACTED]

Hi [REDACTED]

Can you please provide the original work order number?

Thank you

Regards,



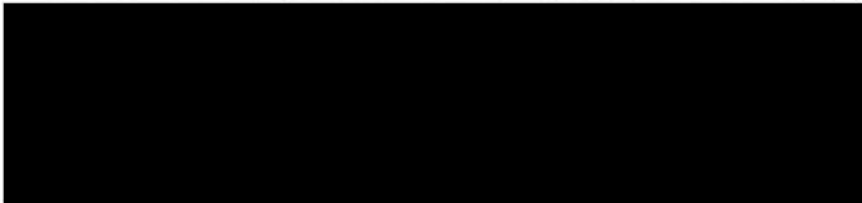
right solutions.  
right partner.

[REDACTED]

2-4 Westall Road, Springvale VIC 3171

[alsglobal.com](http://alsglobal.com)





**CAUTION:** This email originated from outside of ALS. Do not click links or open attachments unless you recognize the sender and are sure content is relevant to you.

Hi ALS Team,

As [redacted] is on leave, is someone available to please assist me with the below analysis request?

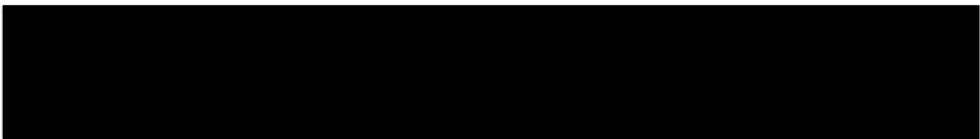
GHD reference no. 12605152

Field ID	Sample date	EP231X: PFAS 28 Analytes	8 Metals	ASLP pH <u>neutral</u> EP231: PFAS short suite/12 analytes
AAN-QC01	25/05/2023			X
AAN-BH02-0.1	25/05/2023	X	X	
AAN-BH02-0.5	25/05/2023	X	X	

Please let me know if I can provide any additional information to assist with this request.

Thanks!

Warm regards



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180 Lonsdale Street, Melbourne VIC 3000 Australia

➔ The Power of Commitment  
Connect



## SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : EM2313141

Client : GHD PTY LTD  
Contact :   
Address : LEVEL 8, 180 LONSDALE ST  
MELBOURNE VIC, AUSTRALIA 3001

Laboratory : Environmental Division Melbourne  
Contact :   
Address : 4 Westall Rd Springvale VIC Australia  
3171

E-mail :   
Telephone :   
Facsimile :

E-mail :   
Telephone :   
Facsimile :

Project : 12605152  
Order number : ----

Page : 1 of 2  
Quote number : EM2021GHDSE0057 (MEBQ/005/21  
(Vic Only, Primary))  
QC Level : NEPM 2013 B3 & ALS QC Standard

C-O-C number : ----  
Site : ----  
Sampler :

### Dates

Date Samples Received : 26-May-2023 10:15  
Client Requested Due : 27-Jul-2023  
Date :

Issue Date : 21-Jul-2023  
Scheduled Reporting Date : **27-Jul-2023**

### Delivery Details

Mode of Delivery : Samples On Hand  
No. of coolers/boxes : ----  
Receipt Detail :

Security Seal : Not Available  
Temperature : ----  
No. of samples received / analysed : 3 / 3

### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **Analytical work for this work order will be conducted at ALS Springvale.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- This is a rebatch of EM2309440 (APAM Apron Development).
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

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

- ### Summary of Sample(s) and Requested Analysis

Matrix: SOIL

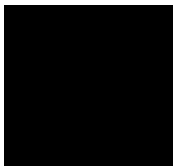
✓	✓	SOIL - EA055-103 Moisture Content
	✓	SOIL - EN60-Dla-P Deionised Water Leach - Plastic Leaching Vessel
	✓	SOIL - EP231 PFAS - Short Suite (12 analytes)
✓	✓	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
✓	✓	SOIL - S-02 8 Metals (incl. Digestion)

The following table summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory.

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

### Requested Deliverables

[illegible]



## CERTIFICATE OF ANALYSIS

**Work Order** : EM2313141  
**Client** : GHD PTY LTD  
**Contact** :   
**Address** : LEVEL 8, 180 LONSDALE ST  
MELBOURNE VIC, AUSTRALIA 3001  
**Telephone** :   
**Project** : 12605152  
**Order number** : ----  
**C-O-C number** : ----  
**Sampler** : ----  
**Site** : ----  
**Quote number** : MEBQ/005/21 (Vic Only, Primary)  
**No. of samples received** : 3  
**No. of samples analysed** : 3

**Page** : 1 of 7  
**Laboratory** : Environmental Division Melbourne  
**Contact** :   
**Address** : 4 Westall Rd Springvale VIC Australia 3171  
**Telephone** :   
**Date Samples Received** : 26-May-2023 10:15  
**Date Analysis Commenced** : 21-Jul-2023  
**Issue Date** : 26-Jul-2023 17:47



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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

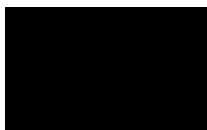
### Signatories

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

*Signatories*

*Position*

*Accreditation Category*



Laboratory Coordinator  
2IC Organic Chemist  
2IC Organic Chemist  
Instrument Operator

Melbourne Inorganics, Springvale, VIC  
Melbourne Inorganics, Springvale, VIC  
Melbourne Organics, Springvale, VIC  
Melbourne Inorganics, Springvale, VIC

Page : 2 of 7  
Work Order : EM2313141  
Client :  
Project :

## General Comments

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

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

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

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

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

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

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

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- EP231X: Poor matrix spike recovery for sample EM2313076-002 due to sample matrix interference.
- This is a rebatch of EM2309440 (APAM Apron Development).
- EN60-DIa-P: EM2313141 #001 Due to limited sample for leach analysis, a scaled down amount of 50g into 1000mL was used.
- 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.
- EN60-DI: Where leachable PFAS analysis is requested, centrifugation rather than pressure filtration is used as the default approach for removal of particulates, in line with AS 4439.3.



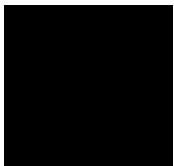












## QUALITY CONTROL REPORT

Work Order : EM2313141

Page : 1 of 9

Client : GHD PTY LTD

Laboratory : Environmental Division Melbourne

Contact : [REDACTED]

Contact : [REDACTED]

Address : LEVEL 8, 180 LONSDALE ST  
MELBOURNE VIC, AUSTRALIA 3001

Address : 4 Westall Rd Springvale VIC Australia 3171

Telephone : [REDACTED]

Telephone : + [REDACTED]

Project : 12605152

Date Samples Received : 26-May-2023

Order number : ----

Date Analysis Commenced : 21-Jul-2023

C-O-C number : ----

Issue Date : 26-Jul-2023

Sampler : ----

Site : ----

Quote number : MEBQ/005/21 (Vic Only, Primary)

No. of samples received : 3

No. of samples analysed : 3



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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

### Signatories

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

Signatories	Position	Accreditation Category
[REDACTED]	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
	2IC Organic Chemist	Melbourne Inorganics, Springvale, VIC
	2IC Organic Chemist	Melbourne Organics, Springvale, VIC
	Instrument Operator	Melbourne Inorganics, Springvale, VIC

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 5187737)									
EM2313159-016	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	14	12	18.9	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	11	9	21.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	11	11	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	17	15	17.4	No Limit
EM2313141-002	AAN-BH02-0.1	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	23	22	0.0	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	89	92	2.7	0% - 20%
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	29	28	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	45	45	0.0	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5186917)									
EM2313141-002	AAN-BH02-0.1	EA055: Moisture Content	----	0.1	%	3.6	4.1	12.1	No Limit
EM2313159-015	Anonymous	EA055: Moisture Content	----	0.1	%	11.4	12.2	6.6	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 5187736)									
EM2313141-002	AAN-BH02-0.1	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EM2313197-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5187699)									
EM2313076-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Page : 3 of 9  
 Work Order : EM2313141  
 Client : GHD PTY LTD  
 Project : 12605152

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: 5187699) - continued									
EM2313076-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EM2313076-011	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5187699)									
EM2313076-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTriDA)	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
EM2313076-011	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 (PFTriDA)	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: 5187699)									
EM2313076-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: <b>SOIL</b>				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: 5187699) - continued									
EM2313076-001	Anonymous	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
EM2313076-011	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: 5187699)							
EM2313076-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EM2313076-011	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5187699)									
EM2313076-001	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

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 Client : GHD PTY LTD  
 Project : 12605152

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 (%)
EP231P: PFAS Sums (QC Lot: 5187699) - continued									
EM2313076-001	Anonymous	EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EM2313076-011	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5193295)									
EM2313141-001	AAN-QC01	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5193295)									
EM2313141-001	AAN-QC01	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5193295)									
EM2313141-001	AAN-QC01	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5193295)									
EM2313141-001	AAN-QC01	EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.02	0.02	0.0	No Limit



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

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

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
						LCS	Low	High
Method: Compound	CAS Number	LOR	Unit	Result				
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5187737)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	123 mg/kg	92.3	70.0	130
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	1.23 mg/kg	86.1	50.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	20.2 mg/kg	87.8	70.0	130
EG005T: Copper	7440-50-8	5	mg/kg	<5	55.9 mg/kg	84.6	70.0	130
EG005T: Lead	7439-92-1	5	mg/kg	<5	62.4 mg/kg	86.1	70.0	130
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.4 mg/kg	84.3	70.0	130
EG005T: Zinc	7440-66-6	5	mg/kg	<5	162 mg/kg	70.9	70.0	130
EN60-DI: Bottle Leaching Procedure - Inorganics/PFAS (Plastic Vessel) (QCLot: 5191269)								
EN60-DIa-P: Final pH	----	0.1	pH Unit	6.8	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5187736)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.64 mg/kg	105	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5187699)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00111 mg/kg	86.7	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	93.6	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00114 mg/kg	89.6	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	96.1	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	92.0	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00121 mg/kg	99.5	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5187699)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	90.0	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.8	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.8	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.3	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.8	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.8	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.7	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.0	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.2	69.0	135
EP231X: Perfluorotridecanoic acid (PFTriDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.8	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	93.3	69.0	133

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 Work Order : EM2313141  
 Client : GHD PTY LTD  
 Project : 12605152

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	High
<b>EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5187699)</b>								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	97.9	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	96.7	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	93.9	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	108	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	103	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
<b>EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5187699)</b>								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	97.3	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00119 mg/kg	99.4	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	103	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00121 mg/kg	90.4	70.0	130
<b>EP231P: PFAS Sums (QCLot: 5187699)</b>								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound CAS Number LOR Unit				Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%)	
							Low	High
<b>EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5193295)</b>								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.222 µg/L	85.4	72.0	130
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.228 µg/L	90.1	68.0	131
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	91.4	65.0	140
<b>EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5193295)</b>								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	84.9	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	89.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	88.3	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	90.1	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	91.7	71.0	133
<b>EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5193295)</b>								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.234 µg/L	90.6	63.0	143



Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5193295) - continued								
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.238 µg/L	98.9	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	95.9	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.242 µg/L	76.8	70.0	130
EP231P: PFAS Sums (QCLot: 5193295)								
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

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

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5187737)							
EM2313141-003	AAN-BH02-0.5	EG005T: Arsenic	7440-38-2	50 mg/kg	92.3	78.0	124
		EG005T: Cadmium	7440-43-9	50 mg/kg	85.8	79.7	116
		EG005T: Chromium	7440-47-3	50 mg/kg	90.8	79.0	121
		EG005T: Copper	7440-50-8	250 mg/kg	95.0	80.0	120
		EG005T: Lead	7439-92-1	250 mg/kg	88.3	80.0	120
		EG005T: Nickel	7440-02-0	50 mg/kg	82.1	78.0	120
		EG005T: Zinc	7440-66-6	250 mg/kg	81.5	80.0	120
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5187736)							
EM2313141-003	AAN-BH02-0.5	EG035T: Mercury	7439-97-6	0.5 mg/kg	112	76.0	116
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5187699)							
EM2313076-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00111 mg/kg	84.3	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00118 mg/kg	94.9	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00114 mg/kg	90.8	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	96.6	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	96.9	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00121 mg/kg	63.9	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5187699)							
EM2313076-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	86.4	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	90.8	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	89.6	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	88.2	71.0	131

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: 5187699) - continued							
EM2313076-002	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	93.4	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	95.6	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	91.8	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	90.8	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	97.1	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	121	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	91.0	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5187699)							
EM2313076-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	84.8	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	99.7	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	95.0	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	95.5	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	95.4	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	101	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	82.4	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5187699)							
EM2313076-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	93.5	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00119 mg/kg	95.4	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	94.9	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00121 mg/kg	# 47.8	70.0	130



## QA/QC Compliance Assessment to assist with Quality Review

Work Order : EM2313141

Page : 1 of 5

Client : GHD PTY LTD

Laboratory : Environmental Division Melbourne

Contact : [REDACTED]

Telephone : [REDACTED]

Project : 12605152

Date Samples Received : 26-May-2023

Site : ----

Issue Date : 26-Jul-2023

Sampler : ----

No. of samples received : 3

Order number : ----

No. of samples analysed : 3

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

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

### Summary of Outliers

#### Outliers : Quality Control Samples

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

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- Matrix Spike outliers exist - please see following pages for full details.
- For all regular sample matrices, **NO** surrogate recovery outliers occur.

#### Outliers : Analysis Holding Time Compliance

- Analysis Holding Time Outliers exist - please see following pages for full details.

#### Outliers : Frequency of Quality Control Samples

- Quality Control Sample Frequency Outliers exist - please see following pages for full details.

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: SOIL

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP231D: (n:2) Fluorotelomer Sulfonic Acids	EM2313076--002	Anonymous	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	47.8 %	70.0-130%	Recovery less than lower data quality objective

Outliers : Analysis Holding Time Compliance

Matrix: SOIL

Method		Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved							
AAN-BH02-0.1,	AAN-BH02-0.5	---	---	---	21-Jul-2023	08-Jun-2023	43
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved							
AAN-BH02-0.1,	AAN-BH02-0.5	21-Jul-2023	22-Jun-2023	29	24-Jul-2023	22-Jun-2023	32

Outliers : Frequency of Quality Control Samples

Matrix: WATER

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Method	0				
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

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

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

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

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

Matrix: SOIL

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)								
Soil Glass Jar - Unpreserved (EA055)								
AAN-BH02-0.1,	AAN-BH02-0.5	25-May-2023	----	----	----	21-Jul-2023	08-Jun-2023	✖

Matrix: SOIL

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) AAN-BH02-0.1, AAN-BH02-0.5	25-May-2023	21-Jul-2023	21-Nov-2023	✓	22-Jul-2023	21-Nov-2023	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T) AAN-BH02-0.1, AAN-BH02-0.5	25-May-2023	21-Jul-2023	22-Jun-2023	✗	24-Jul-2023	22-Jun-2023	✗
EN60-DI: Bottle Leaching Procedure - Inorganics/PFAS (Plastic Vessel)							
Non-Volatile Leach: 180 day HT (e.g. PFAS, metals ex.Hg) (EN60-DIa-P) AAN-QC01	25-May-2023	24-Jul-2023	21-Nov-2023	✓	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X) AAN-BH02-0.1, AAN-BH02-0.5	25-May-2023	21-Jul-2023	21-Nov-2023	✓	24-Jul-2023	30-Aug-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X) AAN-BH02-0.1, AAN-BH02-0.5	25-May-2023	21-Jul-2023	21-Nov-2023	✓	24-Jul-2023	30-Aug-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X) AAN-BH02-0.1, AAN-BH02-0.5	25-May-2023	21-Jul-2023	21-Nov-2023	✓	24-Jul-2023	30-Aug-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X) AAN-BH02-0.1, AAN-BH02-0.5	25-May-2023	21-Jul-2023	21-Nov-2023	✓	24-Jul-2023	30-Aug-2023	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X) AAN-BH02-0.1, AAN-BH02-0.5	25-May-2023	21-Jul-2023	21-Nov-2023	✓	24-Jul-2023	30-Aug-2023	✓

Matrix: WATER

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X) AAN-QC01	24-Jul-2023	25-Jul-2023	20-Jan-2024	✓	26-Jul-2023	20-Jan-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X) AAN-QC01	24-Jul-2023	25-Jul-2023	20-Jan-2024	✓	26-Jul-2023	20-Jan-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) AAN-QC01	24-Jul-2023	25-Jul-2023	20-Jan-2024	✓	26-Jul-2023	20-Jan-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) AAN-QC01	24-Jul-2023	25-Jul-2023	20-Jan-2024	✓	26-Jul-2023	20-Jan-2024	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL** Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	15	13.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	19	10.53	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
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	5.26	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
Method Blanks (MB)							
Deionised Water Leach - Plastic Leaching Vessel	EN60-Dia-P	1	3	33.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	5.26	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
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	5.26	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

Matrix: **WATER** Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	1	100.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	1	100.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	1	100.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	1	0.00	5.00	✗	NEPM 2013 B3 & ALS QC Standard



## Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
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 (SnCl <sub>2</sub> ) (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 SnCl <sub>2</sub> 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)
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
Deionised Water Leach - Plastic Leaching Vessel	EN60-DIa-P	SOIL	In house QWI-EN/60 referenced to AS4439.3 Preparation of Leachates
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).
QuEChERS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.
Solid Phase Extraction (SPE) for PFAS in water	ORG72	SOIL	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

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CHAIN OF CUSTODY RECORD  
GHD Pty Ltd

GHD Melbourne Office Address

180 Lonsdale Street, Melbourne 3000  
Telephone: 613 8687 8000  
Fax: 613 8687 8111

Completion Date / Turnaround

Comments

Page \_\_ of \_\_

Project Number 12605152				Laboratory										<b>COURIER AND LABORATORY INSTRUCTIONS:</b>  - Sign chain of custody document on receipt and release of samples, between each party.  - Samples are to be delivered to the laboratory address shown.  - Laboratory contact should sign the COC and send a copy (via email) to the GHD Project Manager and GHD Contact, along with a sample receipt notice, within 24 hours of receipt.  - A signed copy of the COC should be returned to the GHD Project Manager and GHD Contact with the results via email at the completion of analysis as requested.  - All results should reference the Job Number and Project Name.							
Project Name APAM Apron Development				Laboratory Address																	
GHD Project Manager [REDACTED]				Laboratory Contact																	
GHD Contact [REDACTED]																					
GHD PM email [REDACTED]				GHD Contact email [REDACTED]																	
Sample I.D.		Date		Sample Matrix B: Soil SL: Sludge W: Water A: Air GW: Groundwater	Preservative	Type J: soil jar B: bag V: vial G: glass bottle P: plastic bottle	Number	Volume (ml)	PFAS (28 analytes)	B7: TRH, BTEXN, PAH, Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg)									On Hold	<b>SAMPLE COMMENTS</b>	
AAN-QC02	25/05/2023	1xglass jar, 1xPFAS jar							X	X											PLEASE FORWARD TO EUROFINS
AAN-QC04	25/05/2023	1xglass jar, 1xPFAS jar																X	PLEASE FORWARD TO EUROFINS		
TOTAL NUMBER OF SAMPLES				GENERAL COMMENTS:																	
TOTAL NUMBER OF ESKIES																					
Samples Chilled (Y/N)																					
<b>CUSTODY DETAILS</b>																					
		Name							Date/Time Received							Signature					
SAMPLER		[REDACTED]							26/05/2023							[REDACTED]					
GHD Workstation																					
COURIER																					
LABORATORY																					

DATE: 30/5/23

TIME: 9:00

COURIER:

TEMPERATURE 3.1

ATTEMP TO CHILL: YES

NO

3.17

Sealed

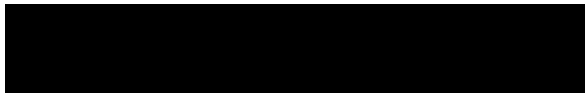
#994260

cl

30/05/23

RELINQUISHED BY  
ELP [ALS]  
29.5.23 1740





Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

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

Eurofins ARL Pty Ltd

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

Eurofins Environment Testing NZ Ltd

NZBN: 9429046024954

Auckland	Christchurch
35 O'Rorke Road Penrose, Auckland 1061 Tel: +64 9 526 4551 IANZ# 1327	43 Detroit Drive Rolleston, Christchurch 7675 Tel: +64 3 343 5201 IANZ# 1290

Sample Receipt Advice

Company name:	GHD Pty Ltd VIC
Contact name:	[REDACTED]
Project name:	APAM APRON DEVELOPMENT
Project ID:	12605152
Turnaround time:	5 Day
Date/Time received	May 30, 2023 9:00 AM
Eurofins reference	994260

Sample Information

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

Notes

Contact

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

[REDACTED]

Results will be delivered electronically via email to [REDACTED]

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







## Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Eurofins Suite B7			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	May 31, 2023	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	May 31, 2023	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	May 31, 2023	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Melbourne	May 31, 2023	14 Days
- Method: LTM-ORG-2010 BTEX and Volatile TRH			
Polycyclic Aromatic Hydrocarbons	Melbourne	May 31, 2023	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Melbourne	May 31, 2023	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Melbourne	May 30, 2023	14 Days
- Method: LTM-GEN-7080 Moisture			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Melbourne	May 31, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Melbourne	May 31, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAAs)	Melbourne	May 31, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Melbourne	May 31, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
PFASs Summations	Melbourne	May 30, 2023	
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

**Company Name:** GHD Pty Ltd VIC  
**Address:** Level 8, 180 Lonsdale St  
Melbourne  
VIC 3000

**Project Name:** APAM APRON DEVELOPMENT  
**Project ID:** 12605152

**Order No.:**  
**Report #:** 994260  
**Phone:** 8687 8000  
**Fax:** 8687 8111

**Received:** May 30, 2023 9:00 AM  
**Due:** Jun 6, 2023  
**Priority:** 5 Day  
**Contact Name:** [REDACTED]

**Eurofins Analytical Services Manager :** [REDACTED]

Sample Detail						HOLD	Moisture Set	Eurofins Suite B7	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
External Laboratory									
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID				
1	AAN-QC02	May 25, 2023		Soil	M23-My0075356		X	X	X
2	AAN-QC04	May 25, 2023		Soil	M23-My0075357	X			
Test Counts						1	1	1	1

## Internal Quality Control Review and Glossary

### General

- 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.
- All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
- Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
- 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

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

### Terms

<b>APHA</b>	American Public Health Association
<b>COC</b>	Chain of Custody
<b>CP</b>	Client Parent - QC was performed on samples pertaining to this report
<b>CRM</b>	Certified Reference Material (ISO17034) - reported as percent recovery.
<b>Dry</b>	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
<b>Duplicate</b>	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
<b>LOR</b>	Limit of Reporting.
<b>LCS</b>	Laboratory Control Sample - reported as percent recovery.
<b>Method Blank</b>	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.
<b>NCP</b>	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.
<b>RPD</b>	Relative Percent Difference between two Duplicate pieces of analysis.
<b>SPIKE</b>	Addition of the analyte to the sample and reported as percentage recovery.
<b>SRA</b>	Sample Receipt Advice
<b>Surr - Surrogate</b>	The addition of a like compound to the analyte target and reported as percentage recovery.
<b>TBTO</b>	Tributyltin oxide ( <i>bis</i> -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.
<b>TCLP</b>	Toxicity Characteristic Leaching Procedure
<b>TEQ</b>	Toxic Equivalency Quotient or Total Equivalence
<b>QSM</b>	US Department of Defense Quality Systems Manual Version 5.4
<b>US EPA</b>	United States Environmental Protection Agency
<b>WA DWER</b>	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

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

- 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.
- 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.
- 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.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
- For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
- 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
<b>Method Blank</b>							
<b>Total Recoverable Hydrocarbons</b>							
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	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
<b>Method Blank</b>							
<b>BTEX</b>							
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	
<b>Method Blank</b>							
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
<b>Method Blank</b>							
<b>Polycyclic Aromatic Hydrocarbons</b>							
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	
<b>Method Blank</b>							
<b>Heavy Metals</b>							
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	
<b>Method Blank</b>							
<b>Perfluoroalkyl carboxylic acids (PFCA's)</b>							
Perfluorobutanoic acid (PFBA)	ug/kg	< 5			5	Pass	



Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
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	
<b>Method Blank</b>							
<b>Perfluoroalkyl sulfonamido substances</b>							
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 5			5	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 5			5	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/kg	< 5			5	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/kg	< 5			5	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/kg	< 5			5	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/kg	< 10			10	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/kg	< 10			10	Pass	
<b>Method Blank</b>							
<b>Perfluoroalkyl sulfonic acids (PFSAs)</b>							
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	
<b>Method Blank</b>							
<b>n:2 Fluorotelomer sulfonic acids (n:2 FTSA)</b>							
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	
<b>LCS - % Recovery</b>							
<b>Total Recoverable Hydrocarbons</b>							
TRH C6-C9	%	102			70-130	Pass	
TRH C10-C14	%	107			70-130	Pass	
TRH C6-C10	%	97			70-130	Pass	
TRH >C10-C16	%	112			70-130	Pass	
<b>LCS - % Recovery</b>							
<b>BTEX</b>							
Benzene	%	87			70-130	Pass	
Toluene	%	88			70-130	Pass	
Ethylbenzene	%	87			70-130	Pass	
m&p-Xylenes	%	77			70-130	Pass	
Xylenes - Total*	%	81			70-130	Pass	
<b>LCS - % Recovery</b>							
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>							
Naphthalene	%	87			70-130	Pass	
<b>LCS - % Recovery</b>							
<b>Polycyclic Aromatic Hydrocarbons</b>							
Acenaphthene	%	82			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Acenaphthylene	%	76			70-130	Pass	
Anthracene	%	118			70-130	Pass	
Benz(a)anthracene	%	78			70-130	Pass	
Benzo(a)pyrene	%	81			70-130	Pass	
Benzo(b&j)fluoranthene	%	82			70-130	Pass	
Benzo(g,h,i)perylene	%	77			70-130	Pass	
Benzo(k)fluoranthene	%	113			70-130	Pass	
Chrysene	%	111			70-130	Pass	
Dibenz(a,h)anthracene	%	81			70-130	Pass	
Fluoranthene	%	87			70-130	Pass	
Fluorene	%	114			70-130	Pass	
Indeno(1,2,3-cd)pyrene	%	76			70-130	Pass	
Naphthalene	%	93			70-130	Pass	
Phenanthrene	%	73			70-130	Pass	
Pyrene	%	85			70-130	Pass	
<b>LCS - % Recovery</b>							
<b>Heavy Metals</b>							
Arsenic	%	106			80-120	Pass	
Cadmium	%	109			80-120	Pass	
Chromium	%	110			80-120	Pass	
Copper	%	108			80-120	Pass	
Lead	%	112			80-120	Pass	
Mercury	%	116			80-120	Pass	
Nickel	%	106			80-120	Pass	
Zinc	%	106			80-120	Pass	
<b>LCS - % Recovery</b>							
<b>Perfluoroalkyl carboxylic acids (PFCAs)</b>							
Perfluorobutanoic acid (PFBA)	%	102			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	87			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	92			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	88			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	94			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	103			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	97			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	107			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	94			50-150	Pass	
Perfluorotridecanoic acid (PFTTrDA)	%	119			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	82			50-150	Pass	
<b>LCS - % Recovery</b>							
<b>Perfluoroalkyl sulfonamido substances</b>							
Perfluorooctane sulfonamide (FOSA)	%	96			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	108			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	105			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	105			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	99			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	108			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	101			50-150	Pass	
<b>LCS - % Recovery</b>							
<b>Perfluoroalkyl sulfonic acids (PFSAs)</b>							
Perfluorobutanesulfonic acid (PFBS)	%	82			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	99			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	80			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	76			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	91			50-150	Pass	

Test				Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluoroheptanesulfonic acid (PFHpS)				%	98			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)				%	97			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)				%	96			50-150	Pass	
<b>LCS - % Recovery</b>										
<b>n:2 Fluorotelomer sulfonic acids (n:2 FTSA)</b>										
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)				%	100			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)				%	99			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)				%	107			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)				%	91			50-150	Pass	
Test	Lab Sample ID	QA Source		Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
<b>Spike - % Recovery</b>										
<b>Total Recoverable Hydrocarbons</b>					Result 1					
TRH C6-C9	M23-My0076601	NCP	%	104				70-130	Pass	
TRH C10-C14	M23-Jn0002971	NCP	%	78				70-130	Pass	
TRH C6-C10	M23-My0076601	NCP	%	95				70-130	Pass	
TRH >C10-C16	M23-Jn0002971	NCP	%	78				70-130	Pass	
<b>Spike - % Recovery</b>										
<b>BTEX</b>					Result 1					
Benzene	M23-My0076601	NCP	%	92				70-130	Pass	
Toluene	M23-My0076601	NCP	%	92				70-130	Pass	
Ethylbenzene	M23-My0076601	NCP	%	91				70-130	Pass	
m&p-Xylenes	M23-My0076601	NCP	%	96				70-130	Pass	
o-Xylene	M23-My0076601	NCP	%	89				70-130	Pass	
Xylenes - Total*	M23-My0076601	NCP	%	93				70-130	Pass	
<b>Spike - % Recovery</b>										
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>					Result 1					
Naphthalene	M23-My0076601	NCP	%	93				70-130	Pass	
<b>Spike - % Recovery</b>										
<b>Polycyclic Aromatic Hydrocarbons</b>					Result 1					
Acenaphthene	M23-My0073238	NCP	%	71				70-130	Pass	
Acenaphthylene	M23-My0073238	NCP	%	79				70-130	Pass	
Anthracene	M23-Jn0003613	NCP	%	119				70-130	Pass	
Benz(a)anthracene	M23-Jn0003613	NCP	%	85				70-130	Pass	
Benzo(a)pyrene	M23-My0073238	NCP	%	79				70-130	Pass	
Benzo(b&j)fluoranthene	M23-My0073238	NCP	%	82				70-130	Pass	
Benzo(g,h,i)perylene	M23-My0073238	NCP	%	78				70-130	Pass	
Benzo(k)fluoranthene	M23-My0073238	NCP	%	110				70-130	Pass	
Chrysene	M23-My0073238	NCP	%	90				70-130	Pass	
Dibenz(a,h)anthracene	M23-My0073238	NCP	%	95				70-130	Pass	
Fluoranthene	M23-My0073238	NCP	%	78				70-130	Pass	
Fluorene	M23-My0073238	NCP	%	88				70-130	Pass	
Indeno(1,2,3-cd)pyrene	M23-My0073238	NCP	%	75				70-130	Pass	
Naphthalene	M23-My0073238	NCP	%	71				70-130	Pass	
Phenanthrene	M23-My0073238	NCP	%	82				70-130	Pass	
Pyrene	M23-My0073238	NCP	%	80				70-130	Pass	
<b>Spike - % Recovery</b>										
<b>Heavy Metals</b>					Result 1					
Arsenic	M23-My0078490	NCP	%	89				75-125	Pass	
Cadmium	M23-My0078490	NCP	%	103				75-125	Pass	
Chromium	M23-My0078490	NCP	%	96				75-125	Pass	
Copper	M23-My0078490	NCP	%	96				75-125	Pass	
Lead	M23-My0078490	NCP	%	91				75-125	Pass	
Mercury	M23-My0078490	NCP	%	110				75-125	Pass	
Nickel	M23-My0078490	NCP	%	101				75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Zinc	M23-My0078490	NCP	%	105			75-125	Pass	
<b>Spike - % Recovery</b>									
<b>Perfluoroalkyl carboxylic acids (PFCAs)</b>				Result 1					
Perfluorobutanoic acid (PFBA)	M23-My0078228	NCP	%	107			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M23-My0078228	NCP	%	98			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M23-My0078228	NCP	%	95			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-My0078228	NCP	%	91			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M23-My0078228	NCP	%	97			50-150	Pass	
Perfluorononanoic acid (PFNA)	M23-My0078228	NCP	%	107			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M23-My0078228	NCP	%	102			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-My0078228	NCP	%	108			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-My0078228	NCP	%	90			50-150	Pass	
Perfluorotridecanoic acid (PFTTrDA)	M23-My0078228	NCP	%	119			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-My0078228	NCP	%	83			50-150	Pass	
<b>Spike - % Recovery</b>									
<b>Perfluoroalkyl sulfonamido substances</b>				Result 1					
Perfluorooctane sulfonamide (FOSA)	M23-My0078228	NCP	%	102			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-My0078228	NCP	%	111			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-My0078228	NCP	%	106			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-My0078228	NCP	%	107			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-My0078228	NCP	%	103			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-My0078228	NCP	%	110			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-My0078228	NCP	%	109			50-150	Pass	
<b>Spike - % Recovery</b>									
<b>Perfluoroalkyl sulfonic acids (PFSA's)</b>				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M23-My0078228	NCP	%	86			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-My0078228	NCP	%	102			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-My0078228	NCP	%	82			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-My0078228	NCP	%	79			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-My0078228	NCP	%	92			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-My0078228	NCP	%	103			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-My0078228	NCP	%	98			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-My0078228	NCP	%	98			50-150	Pass	
<b>Spike - % Recovery</b>									
<b>n:2 Fluorotelomer sulfonic acids (n:2 FTSA's)</b>				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M23-My0078228	NCP	%	99			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-My0078228	NCP	%	97			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-My0078228	NCP	%	115			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-My0078228	NCP	%	93			50-150	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
<b>Duplicate</b>									
<b>Total Recoverable Hydrocarbons</b>				Result 1	Result 2	RPD			
TRH C6-C9	M23-My0078239	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	M23-My0076545	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M23-My0076545	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M23-My0076545	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C6-C10	M23-My0078239	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	M23-My0076545	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M23-My0076545	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M23-My0076545	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
<b>Duplicate</b>									
<b>BTEX</b>				Result 1	Result 2	RPD			
Benzene	M23-My0078239	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M23-My0078239	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M23-My0078239	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M23-My0078239	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M23-My0078239	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	M23-My0078239	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
<b>Duplicate</b>									
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>				Result 1	Result 2	RPD			
Naphthalene	M23-My0078239	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
<b>Duplicate</b>									
<b>Polycyclic Aromatic Hydrocarbons</b>				Result 1	Result 2	RPD			
Acenaphthene	M23-My0080180	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	M23-My0080180	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	M23-My0080180	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	M23-My0080180	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	M23-My0080180	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	M23-My0080180	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g,h,i)perylene	M23-My0080180	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	M23-My0080180	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	M23-My0080180	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a,h)anthracene	M23-My0080180	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	M23-My0080180	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	M23-My0080180	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1,2,3-cd)pyrene	M23-My0080180	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	M23-My0080180	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	M23-My0080180	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	M23-My0080180	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
<b>Duplicate</b>									
<b>Heavy Metals</b>				Result 1	Result 2	RPD			
Arsenic	L23-My0067958	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Cadmium	L23-My0067958	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	L23-My0067958	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Copper	L23-My0067958	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Lead	L23-My0067958	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Mercury	L23-My0067958	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	L23-My0067958	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	L23-My0067958	NCP	mg/kg	< 5	< 5	<1	30%	Pass	

Duplicate								
Sample Properties				Result 1	Result 2	RPD		
% Moisture	M23-My0076508	NCP	%	19	20	2.3	30%	Pass
Duplicate								
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD		
Perfluorobutanoic acid (PFBA)	L23-My0067962	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluoropentanoic acid (PFPeA)	L23-My0067962	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorohexanoic acid (PFHxA)	L23-My0067962	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluoroheptanoic acid (PFHpA)	L23-My0067962	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorooctanoic acid (PFOA)	L23-My0067962	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorononanoic acid (PFNA)	L23-My0067962	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorodecanoic acid (PFDA)	L23-My0067962	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluoroundecanoic acid (PFUnDA)	L23-My0067962	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorododecanoic acid (PFDoDA)	L23-My0067962	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorotridecanoic acid (PFTrDA)	L23-My0067962	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorotetradecanoic acid (PFTeDA)	L23-My0067962	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Duplicate								
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD		
Perfluorooctane sulfonamide (FOSA)	L23-My0067962	NCP	ug/kg	< 5	< 5	<1	30%	Pass
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	L23-My0067962	NCP	ug/kg	< 5	< 5	<1	30%	Pass
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	L23-My0067962	NCP	ug/kg	< 5	< 5	<1	30%	Pass
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	L23-My0067962	NCP	ug/kg	< 5	< 5	<1	30%	Pass
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	L23-My0067962	NCP	ug/kg	< 5	< 5	<1	30%	Pass
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	L23-My0067962	NCP	ug/kg	< 10	< 10	<1	30%	Pass
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	L23-My0067962	NCP	ug/kg	< 10	< 10	<1	30%	Pass
Duplicate								
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD		
Perfluorobutanesulfonic acid (PFBS)	L23-My0067962	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorononanesulfonic acid (PFNS)	L23-My0067962	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluoropropanesulfonic acid (PFPrS)	L23-My0067962	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluoropentanesulfonic acid (PFPeS)	L23-My0067962	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorohexanesulfonic acid (PFHxS)	L23-My0067962	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluoroheptanesulfonic acid (PFHpS)	L23-My0067962	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorooctanesulfonic acid (PFOS)	L23-My0067962	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorodecanesulfonic acid (PFDS)	L23-My0067962	NCP	ug/kg	< 5	< 5	<1	30%	Pass

Duplicate								
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)				Result 1	Result 2	RPD		
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	L23-My0067962	NCP	ug/kg	< 5	< 5	<1	30%	Pass
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	L23-My0067962	NCP	ug/kg	< 10	< 10	<1	30%	Pass
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	L23-My0067962	NCP	ug/kg	< 5	< 5	<1	30%	Pass
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	L23-My0067962	NCP	ug/kg	< 5	< 5	<1	30%	Pass

## Comments

### Sample Integrity

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

### Qualifier Codes/Comments

Code	Description
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:

Analytical Services Manager  
Senior Analyst-PFAS  
Senior Analyst-Sample Properties  
Senior Analyst-Organic  
Senior Analyst-Metal  
Senior Analyst-Volatile

### Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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NATA# 1261  
Site# 25079 & 25289

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NATA# 2377 Site# 2370

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

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

**Company Name:** GHD Pty Ltd VIC  
**Address:** Level 8, 180 Lonsdale St  
Melbourne  
VIC 3000  
**Project Name:** APAM APRON DEVELOPMENT  
**Project ID:** 12605152

**Order No.:**  
**Report #:** 994260  
**Phone:** 8687 8000  
**Fax:** 8687 8111

**Received:** May 30, 2023 9:00 AM  
**Due:** Jun 6, 2023  
**Priority:** 5 Day  
**Contact Name:** [REDACTED]

**Eurofins Analytical Services Manager :** [REDACTED]

Sample Detail						HOLD	Moisture Set	Eurofins Suite B7	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
External Laboratory									
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID				
1	AAN-QC02	May 25, 2023		Soil	M23-My0075356		X	X	X
2	AAN-QC04	May 25, 2023		Soil	M23-My0075357	X			
Test Counts						1	1	1	1

## Tyrone Gowans

---

**From:** [REDACTED]  
**Sent:** Tuesday, 11 July 2023 3:05 PM  
**To:** [REDACTED]  
**Cc:** [REDACTED] #AU\_CAU001\_EnviroSampleVic  
**Subject:** RE: GHD 12605152 Leachate analysis request

**Follow Up Flag:** Follow up  
**Flag Status:** Completed

**CAUTION: EXTERNAL EMAIL** - Sent from an email domain that is not formally trusted by Eurofins.

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Hi [REDACTED]

That does, thanks!

I would like to continue with the analysis for ASLP pH neutral only - i.e., 1x extraction and 1x analytical for the listed samples.

Warm regards

**GHD**

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180 Lonsdale Street, Melbourne VIC 3000 Australia

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Connect



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Thanks [REDACTED]

The cost will be for 2 x ASLP extraction, 2 x PFAS analytical. I hope that answers your question.

Kind regards,

#1006796  
11/7/23

## Tyrone Gowans

---

**From:** [REDACTED]  
**Sent:** Tuesday, 11 July 2023 2:28 PM  
**To:** [REDACTED]  
**Cc:** [REDACTED] AU\_CAU001\_EnviroSampleVic  
**Subject:** RE: GHD 12605152 Leachate analysis request

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

**Categories:** ADDITIONALS

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

Thanks [REDACTED]

The cost will be for 2 x ASLP extraction, 2 x PFAS analytical. I hope that answers your question.

[REDACTED]  
Kind regards,

75356  
357

600 f6203



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Total Sulfur in Soils by LECO, NATA Accredited

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**From:** [REDACTED]  
**Sent:** Tuesday, 11 July 2023 2:15 PM  
**To:** [REDACTED]  
**Cc:** [REDACTED]  
**Subject:** GHD 12605152 Leachate analysis request

#1006796  
u / 8/21

**CAUTION:** EXTERNAL EMAIL - Sent from an email domain that is not formally trusted by Eurofins.

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Hi [REDACTED]

May I please request leachate analysis (ASLP pH neutral) for PFAS (short suite – 12 analytes) on the following 2 samples?

Could you please tell me if there is an additional cost to completing the same leachate analysis in unbuffered solution, in addition to the above?

GHD reference no. 12605152

Field ID	Sample date
AAN-QC01	25/05/2023
AAN-QC02	25/05/2023

Thanks for you help! Looking forward to hearing back from you.

Warm regards

**GHD**

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180 Lonsdale Street, Melbourne VIC 3000 Australia

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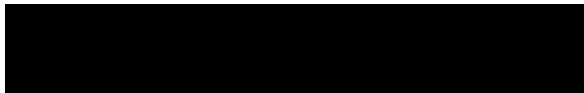
Connect



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#1006796  
021  
11/8/23



Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

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Eurofins ARL Pty Ltd

ABN: 91 05 0159 898

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

Eurofins Environment Testing NZ Ltd

NZBN: 9429046024954

Auckland	Christchurch
35 O'Rorke Road Penrose, Auckland 1061 Tel: +64 9 526 4551 IANZ# 1327	43 Detroit Drive Rolleston, Christchurch 7675 Tel: +64 3 343 5201 IANZ# 1290

Sample Receipt Advice

Company name:	GHD Pty Ltd VIC
Contact name:	
Project name:	APAM APRON DEVELOPMENT
Project ID:	12605152
Turnaround time:	5 Day
Date/Time received	Jul 11, 2023 3:05 PM
Eurofins reference	1006796

Sample Information

- ✓

A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ✓

All samples have been received as described on the above COC.
- ✓

COC has been completed correctly.
- ✓

Attempt to chill was evident.
- ✓

Appropriately preserved sample containers have been used.
- ✓

All samples were received in good condition.
- ✓

Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ✓

Appropriate sample containers have been used.
- ✓

Sample containers for volatile analysis received with zero headspace.
- ✗

Split sample sent to requested external lab.
- ✗

Some samples have been subcontracted.
- N/A

Custody Seals intact (if used).

Notes

Contact

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

Results will be delivered electronically via email to

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



## 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
AUS Leaching Procedure			
pH (initial) - Method: LTM-GEN-7010 Leaching Procedure for Soils & Solid Wastes	Melbourne	Jul 12, 2023	0 Days
pH (Leachate fluid) - Method: LTM-GEN-7010 Leaching Procedure for Soils & Solid Wastes	Melbourne	Jul 12, 2023	0 Days
pH (off) - Method: LTM-GEN-7010 Leaching Procedure for Soils & Solid Wastes	Melbourne	Jul 12, 2023	0 Days
Per- and Polyfluoroalkyl Substances (PFASs) - Short - Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)	Melbourne	Jul 13, 2023	28 Days

**Company Name:** GHD Pty Ltd VIC  
**Address:** Level 8, 180 Lonsdale St  
Melbourne  
VIC 3000  
  
**Project Name:** APAM APRON DEVELOPMENT  
**Project ID:** 12605152

**Order No.:**  
**Report #:** 1006796  
**Phone:** 8687 8000  
**Fax:** 8687 8111

**Received:** Jul 11, 2023 3:05 PM  
**Due:** Jul 18, 2023  
**Priority:** 5 Day  
**Contact Name:** [REDACTED]

Eurofins Analytical Services Manager : [REDACTED]

## Sample Detail

AUS Leaching Procedure

Per- and Polyfluoroalkyl Substances (PFASs)  
- Short

Melbourne Laboratory - NATA # 1261 Site # 1254

X

X

External Laboratory

No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
1	AAN-QC02	May 25, 2023		AUS Leachate - Reagent Water	M23-JI0020693	X	X
2	AAN-QC04	May 25, 2023		AUS Leachate - Reagent Water	M23-JI0020694	X	X

Test Counts

2

2



## 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

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

### Terms

<b>APHA</b>	American Public Health Association
<b>COC</b>	Chain of Custody
<b>CP</b>	Client Parent - QC was performed on samples pertaining to this report
<b>CRM</b>	Certified Reference Material (ISO17034) - reported as percent recovery.
<b>Dry</b>	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
<b>Duplicate</b>	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
<b>LOR</b>	Limit of Reporting.
<b>LCS</b>	Laboratory Control Sample - reported as percent recovery.
<b>Method Blank</b>	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.
<b>NCP</b>	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.
<b>RPD</b>	Relative Percent Difference between two Duplicate pieces of analysis.
<b>SPIKE</b>	Addition of the analyte to the sample and reported as percentage recovery.
<b>SRA</b>	Sample Receipt Advice
<b>Surr - Surrogate</b>	The addition of a like compound to the analyte target and reported as percentage recovery.
<b>TBTO</b>	Tributyltin oxide ( <i>bis</i> -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.
<b>TCLP</b>	Toxicity Characteristic Leaching Procedure
<b>TEQ</b>	Toxic Equivalency Quotient or Total Equivalence
<b>QSM</b>	US Department of Defense Quality Systems Manual Version 5.4
<b>US EPA</b>	United States Environmental Protection Agency
<b>WA DWER</b>	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	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
<b>Spike - % Recovery</b>									
<b>Per- and Polyfluoroalkyl Substances (PFASs) - Short</b>				Result 1					
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-JI0022822	NCP	%	125			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-JI0022822	NCP	%	94			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-JI0022822	NCP	%	103			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M23-JI0022822	NCP	%	116			50-150	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
<b>Duplicate</b>									
<b>Per- and Polyfluoroalkyl Substances (PFASs) - Short</b>				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-JI0020694	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-JI0020694	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-JI0020694	CP	ug/L	0.01	0.01	8.6	30%	Pass	
Perfluorooctanoic acid (PFOA)	M23-JI0020694	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

## Comments

### Sample Integrity

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

### Qualifier Codes/Comments

Code	Description
C01	Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.

### Authorised by:



Analytical Services Manager  
Senior Analyst-PFAS

### Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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**Project ID:** 12605152

**Order No.:**  
**Report #:** 1006796  
**Phone:** 8687 8000  
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**Received:** Jul 11, 2023 3:05 PM  
**Due:** Jul 18, 2023  
**Priority:** 5 Day  
**Contact Name:** [REDACTED]

Eurofins Analytical Services Manager : [REDACTED]

Sample Detail						AUS Leaching Procedure	Per- and Polyfluoroalkyl Substances (PFASs) - Short
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
External Laboratory							
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
1	AAN-QC02	May 25, 2023		AUS Leachate - Reagent Water	M23-JI0020693	X	X
2	AAN-QC04	May 25, 2023		AUS Leachate - Reagent Water	M23-JI0020694	X	X
Test Counts						2	2

<b>Project name</b>		Apron Development - Alpha Apron North & Hotel Apron South Design & Planning Services					
<b>Document title</b>		Report   [Document subtitle]					
<b>Project number</b>		12605152					
<b>File name</b>		12605152-RPT-Contamination_Investigation.docx					
<b>Status Code</b>	<b>Revision</b>	<b>Author</b>	<b>Reviewer</b>		<b>Approved for issue</b>		
			<b>Name</b>	<b>Signature</b>	<b>Name</b>	<b>Signature</b>	<b>Date</b>
S3	P01						11/08/23

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[Compliance statement]

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