Report

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Project Name	Kimberley Supply Chain Cluster - Final Approvals Documentation		
Subject	Results of February 2025 Marine Environmental Quality Survey		

1. Introduction

To address Western Australian Environmental Protection Authority (EPA) and public comments on the baseline Marine Environmental Quality (MEQ) of the Environmental Review Documentation (ERD) for the Kimberley Supply Chain Cluster proposal (the 'Proposal'), a February 2025 MEQ baseline survey of the marine water and sediment quality was undertaken in accordance with the Marine Environmental Quality Management Plan (MEQMP) of the Operational Environmental Management Plan (OEMP) (Appendix A of Proposal's ERD).

1.1 Purpose of this report

The purpose of this report is to provide the findings and assessment of a February 2025 water and sediment quality survey to characterise the current MEQ status of the Proposal area and its locale.

2. Limitations

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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.

Accessibility of documents

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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.

3. Overview of field survey

Six (6) sites for water sampling and five (5) sites for sediment sampling of the eight (8) monitoring sites that are prescribed in the Marine Environmental Quality Management Plan (MEQMP) of the Operational Environmental Management Plan (OEMP) of the Kimberley Supply Chain Cluster proposal (see Appendix A of GHD [2025]) were surveyed on 26 February 2025. These sites are illustrated in Figure 1. A summary of the monitoring site identifiers, latitudes and longitudes, time of sampling, water depths and water sampling depths, and description of conditions during monitoring and sediment observations are provided in Table 1. The two (2) sites within the proposed Moderate Ecological Protection Area (MEPA) (sites M-E and M-W) directly offshore of the proposed wharf were not sampled as no construction operational activities have been approved or commenced. However, the two (2) sites at the eastern (site H-E) and western (H-W) boundaries of the High Ecological Protection Area (HEPA) and MEPA were sampled for both water and sediments. Both water and sediment samples were collected from the two (2) bay sites (sites H-B2 and H-B3) and the eastern reference site (R-E). Due to logistical constraints with transport to/from Cockatoo Island, there was insufficient time to acquire sediments from the western reference monitoring site (R-W), but water samples were acquired.

Table 1 Overview of monitoring sites and summary of field notes

Site ID	Target/Actual Latitude	Target Longitude & Actual Longitude	Time	Water Depth & Sample Depth	Description
H-W	16° 06.225'S 16° 06.226'S	123° 37.045'E 123° 37.045'E	14:03	~15 m 7.5 m	Western MEPA-HEPA boundary Conditions: Minimal wind, calm sea Sediments: grey, fine, poorly graded, saturated, loose sandy silt
H-E	16° 06.296'S 16° 06.279'S	123° 37.198'E 123° 37.187'E	13:00	~14 m 7 m	Eastern MEPA-HEPA boundary Conditions: Minimal wind, calm sea Sediments: sand, brown/grey, medium-coarse grained, poorly graded, saturated, loos with some shell and rock fragments
H-B2	16° 06.337'S 16° 06.334'S	123° 37.422'E 123° 37.448'E	12:00	~5 m 2.5 m	Middle of Bay 2 Conditions: Minimal wind, calm sea Sediments: sandy silt, fine, poorly graded, loose, site further inshore of bay than target location to acquire sediment
H-B3	16° 06.291'S 16° 06.334'S	123° 37.822'E 123° 37.448'E	11:11	~5 m 2.5 m	Middle of Bay 3 Conditions: Minimal wind, calm sea Sediments: sandy silt, grey, fine, poorly graded, site further inshore of bay than target location to acquire sediment
R-W	16° 04.964'S 16° 04.966'S	123° 34.902'E 123° 34.903'E	15:00	~5 m 2.5 m	West-northwest reference Conditions: Minimal wind, calm sea No sediment samples acquired as insufficient time
R-E	16° 06.466'S 16° 06.463'S	123° 38.896'E 123° 38.816'E	10:08	~14 m 7.5 m	East-southeast reference Conditions: No wind, calm sea Sediments: sandy silt, grey, fine, poorly graded, saturated, loose, some colour, no odours
M-W	16° 06.239'S	123° 37.076'E	-	-	Western MEPA Insufficient time to sample
M-E	16° 06.281'S	123° 37.177'E	-	-	Eastern MEPA Insufficient time to sample

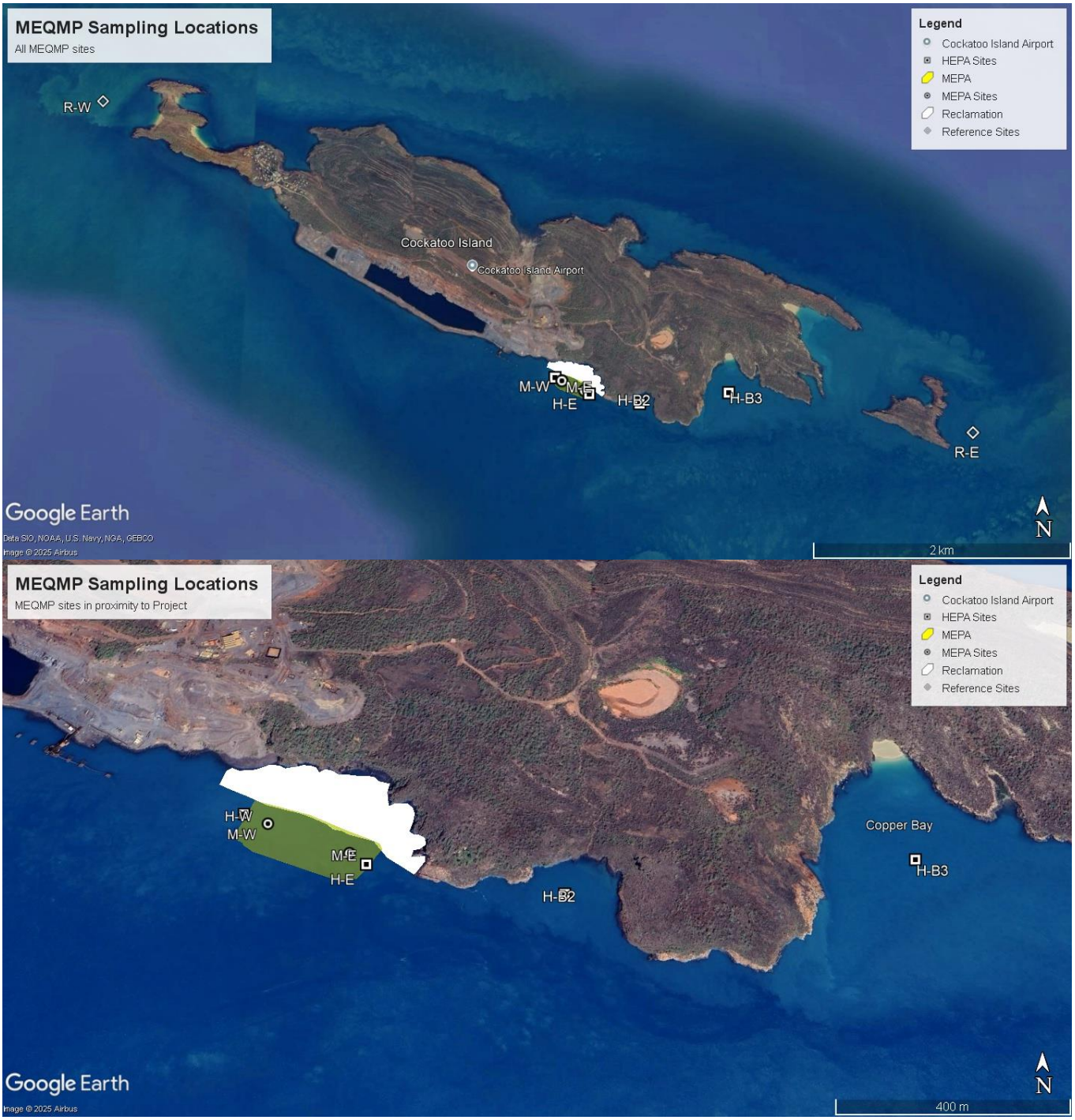

Figure 1 ***Sampling sites in region of project (top) and around Cockatoo Island (bottom).***

At each site the following procedure was carried out at each monitoring site:

– A YSI sonde profile of temperature, salinity, dissolved oxygen, pH and turbidity was acquired through the water column.

– Two replicate water samples were collected at mid-depth with a Niskin bottle with unfiltered samples directly decanted into pre-labelled laboratory provided containers. Filtered samples were syringe filtered and then placed into pre-labelled laboratory provided containers. Refer to Table 2 for an overview of containers, analytical laboratories and analytes

– Three replicate sediment samples were collected with a van Veen grab. Sediment samples were deposited into a stainless steel mixing bowl for photography, visual assessment (in accordance with AS 1726 – Geotechnical Site Investigations with recording of characteristics [i.e. physical appearance, colour, odour,

plasticity, sand grain size and presence of organic matter, marine organisms, mineral ore, shell and other relevant features]) and sampling.

- For volatiles (i.e. TRH, BTEXN, PAH) sediment sub-samples were collected from midway within the grab sample in accordance with NAGD (2018) with sufficient material to completely fill the sample containers.
- For the remaining sub-samples, the grab sample was then homogenised in a large stainless steel bucket/bowl and then sub-sampled to fill sample containers.

All samples were kept iced and in the dark in eskys.

Refer to Table 3 for an overview of containers, analytical laboratories and analytes for sediment samples.

Table 2 Water sampling: overview of sample containers, analytical laboratories and storage/holding time limits

Container	Lab	Analytes	Filtered	Storage and Holding Time
2x 10 ml PP tubes	MAFRL	NH4, NOX, PO4	Yes	Store cold for 24 hours or freeze 1 month
2x 10 ml PP tubes	MAFRL	Filtered Metals	Yes	2 weeks before acidification, then 6 months
1x 125 ml HDPE bottle	MAFRL	CrVI	Yes	Store cold 28 days
1x 125 ml Glass bottle	MAFRL	Hg	Yes	2 weeks before acidification, then 6 months
2x 125 ml HDPE bottles	MAFRL	TN, TP	No	Store cold for 24 hours or freeze 1 month
1x 125 ml HDPE bottle	MAFRL	Turbidity, Salinity	No	Store cold for 2 days
2x 40 ml Amber VOC Vial – Sulfuric Acid	ALS	BTEXN & Naphthalene	No	Store cold for 14 days

Table 3 Sediment sampling: overview of sample containers, analytical laboratories and storage/holding time limits

Container	Lab	Analytes	Storage and Holding Time
2x 70 ml PP jars	MAFRL – Primary Lab	TKN, TP, TOC, Metals	Store cold 7 days
312 x 200 mm Sandvik zip-lock bag with ~200 ml sediment	MAFRL	PSD	Store cold 7 days
1x 150 ml Soil Glass Jar	ALS– Primary Lab	TRH, BTEXN, PAH	Store cold 7 days
1x 150 ml Soil Glass Jar	ALS– Primary Lab	TBT	Store cold 28 days
1x 150 ml Soil Glass Jar	ALS– Secondary Lab	Metals	Store cold 7 days
1x 250 ml Soil Glass Jar	Eurofinns – Secondary Lab	TRH, BTEXN, PAH	Store cold 7 days TBT: Store cold 28 days

4. Results

4.1 Tides and seas conditions

The predicted low tide at Koolan Island was 4.83 m Lowest Astronomical Tide (LAT) at 0938 and the predicted high tide was 6.63 m LAT at 16:11. Hence sampling took place during a flood tidal phase for neap tidal conditions.

Calm sea conditions prevailed over the MEQ survey on 24 February from 10:00-15:30 (see Table 1).

4.2 Vertical sonde profiles through the water column

Vertical profiles with the YSI sonde through the water column are illustrated in Figure 2 where:

- Water temperatures ranged from 31-31.7°C in the surface waters over the day and were ~30.9°C below water depths of ~10 m.
- Salinity ranged from 34.25-34.45 parts per thousand (ppt) at all stations through the water column except for the eastern reference site with a salinity range of 34.05-34.15 ppt. This differing salinity signature suggests that the water mass during the flood tide at site R-E differed from those at the other sites.
- Dissolved oxygen was near/at saturation through the water column at all sites.
- Turbidity was low (~<1 nephelometric turbidity units [NTU]) at all sites.

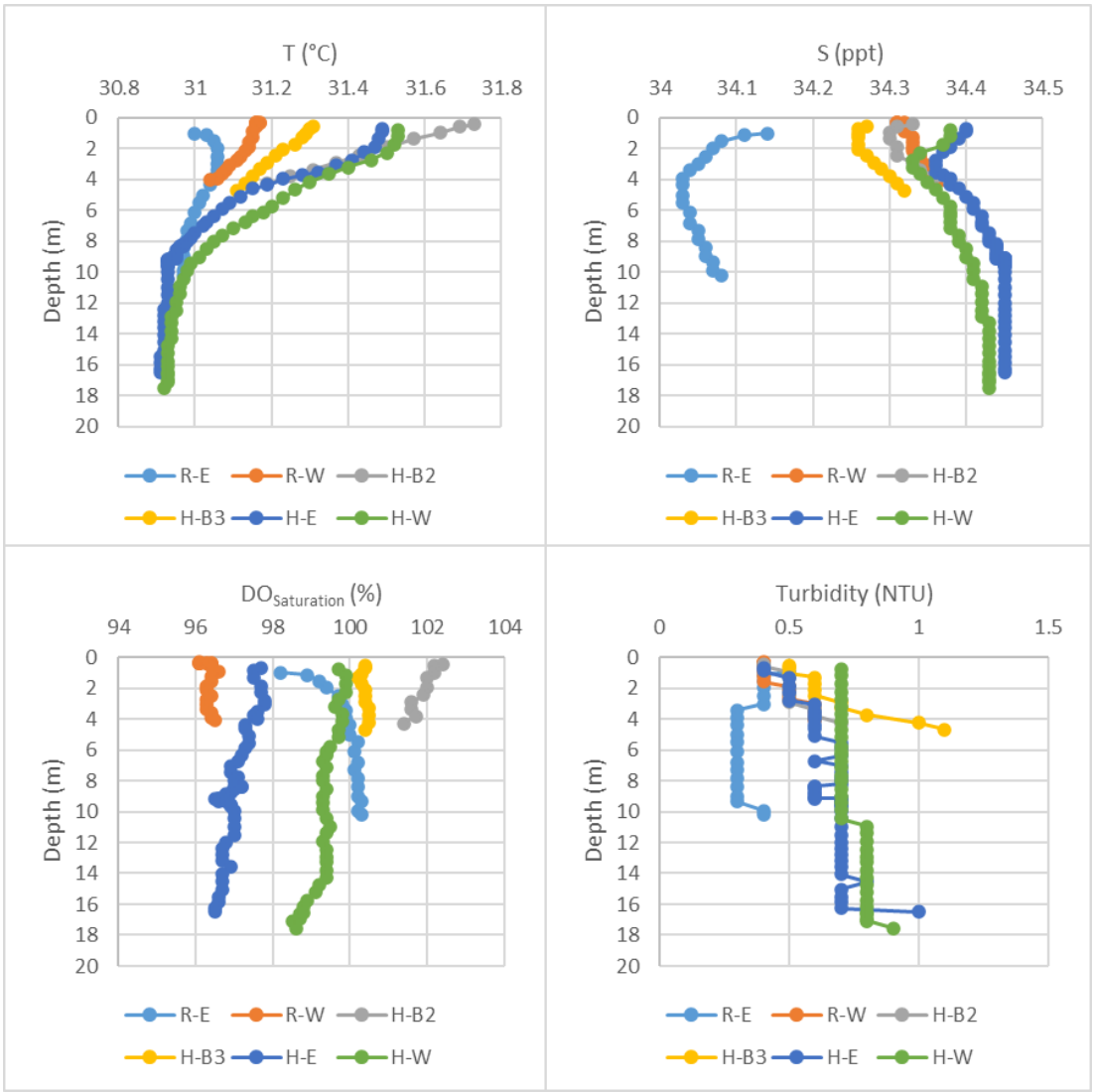

Figure 2 ***Sonde profiles of temperature (T), salinity (S), dissolved oxygen saturation ($DO_{Saturation}$) and turbidity through the water column at each site***

4.3 Water quality

4.3.1 Metals/metalloids and nutrients

Appendix A provides the Chain of Custody (CoC) and water quality data report of the salinity, turbidity, metals and metalloids, and nutrients analytes from MAFRL. A summary of the replicate measurements at each site (i.e. two mid-depth water samples from each site) is provided in Table 4 where:

– Salinity and turbidity ranged from 34.1-34.5 psu, and 0.4-1.1 NTU, respectively, in reasonable agreement with the sonde profiles described in Section 4.2.
– Nutrients:
  - Generally, PO_4 (6-10 µg P/L) was approximately half of TP (16-19 µg P/L).
  - NH_X (20-180 µg N/L except for the outlier of sample H-B2 of 3 µg N/L) was substantially greater than NO_X (2-12 µg N/L except for the outlier of sample H-E of 38 µg N/L).
  - TN ranged from 180-390 µg N/L.
– Filtered metals and metalloids:
  - Mercury (Hg), chromium (Cr), cobalt (Co), silver (Ag), cadmium (Cd) and lead (Pb) were all below the limit of reporting (LoR) and the HEPA EQG.
  - Vanadium (V) ranged from 1.7-1.9 µg V/L, well below the HEPA EQG of 50 µg V/L.
  - Nickel (Ni) was above LoR at two sites in the range of 0.5-1.7 µg Ni/L, well below the HEPA EQG of 7 µg Ni/L.
  - Zinc (Zn) was above LoR at three sites in the range of 1-3 µg Zn/L except for one outlier of 5 µg Zn/L that exceeded the HEPA EQG of 3.3 µg Zn/L.
  - Copper (Cu) was above LoR at two sites in the range of 0.3-0.7 µg Ni/L, just above the HEPA EQG of 0.3 µg Ni/L.
  - There were no exceedances of the MEPA EQGs.

4.3.1.1 QA/QC

The relative percentage differences (RPDs) of replicate measurements were below or equal to 50% (measure of acceptable variability between replicates. i.e. NAGD [2009]) except for:

– One site for turbidity, TN and Cu.
– Two sites for Zn.
– Four sites for NH_X and NO_X.

Table 4 Salinity, turbidity, nutrients and metals/metalloids measurements of replicate mid-depth water samples. Yellow shading denotes exceedance of the HEPA EQG.

Analyte	Units	LoR	HEPA EQG[1]	MEPA EQG[2]	H-W	H-Wa	H-E	H-Ea	H-B2	H-B2a	H-B3	H-B3a	R-W	R-Wa	R-E	R-Ea
Salinity	psu	<0.1	-	-	34.5	34.5	34.4	34.5	34.4	34.4	34.3	34.3	34.3	34.3	34.1	34.0
Turbidity	NTU	<0.1	-	-	0.8	0.7	1.0	0.8	0.8	1.1	0.9	1.5	0.7	1.1	0.8	0.4
NH_X	µg N/L	<3	-	-	73	70	180	50	3	94	94	21	20	140	26	22
PO4	µg P/L	<2	-	-	9	8	8	9	6	8	9	8	8	8	10	9
NO_X	µg N/L	<2	-	-	5	11	38	11	5	8	12	6	9	14	5	2
TP	µg P/L	<5	-	-	17	17	17	17	16	17	18	17	19	19	17	18
TN	µg N/L	<50	-	-	200	250	360	290	170	260	180	180	190	390	220	160
Filtered Hg	ug Hg/L	<0.1	0.1	0.7	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Filtered V	µg V/L	<0.3	50	160	1.7	1.8	1.8	1.8	1.8	1.8	1.9	1.8	1.9	1.8	1.8	1.9
Filtered Cr	µg Cr/L	<0.2	7.7	49	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Filtered Co	µg Co/L	<0.05	1	14	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Filtered Ni	µg Ni/L	<0.3	7	200	<0.3	<0.3	0.3	<0.3	<0.3	<0.3	0.5	0.5	<0.3	<0.3	1.7	0.5
Filtered Cu	µg Cu/L	<0.2	0.3	3	<0.2	<0.2	0.2	<0.2	<0.2	<0.2	0.3	0.3	<0.2	<0.2	0.4	0.7
Filtered Zn	µg Zn/L	<1	3.3	12	<1	<1	<1	<1	<1	<1	1	1	1	3	5	2
Filtered Ag	µg Ag/L	<0.1	0.8	1.8	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Filtered Cd	µg Cd/L	<0.1	0.7	14	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Filtered Pb	µg Pb/L	<0.1	2.2	6.6	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	0.3

[1] High Ecological Protection Area = HEPA, Environmental Quality Guideline = EQG, See GHD (2025) Appendix A Marine Environmental Quality Management Plan (MEQMP).
[2] Moderate Ecological Protection Area = MEPA, Environmental Quality Guideline = EQG, See GHD (2025) Appendix A Marine Environmental Quality Management Plan (MEQMP).

4.3.2 TPH, TRH, BTEX and naphthalene

Appendix B provides the CoC, Certificate of Analysis (CoA), Quality Control Report (QCR) and QA/QC Compliance Assessment (QA/QC CA) from the analysis laboratory ALS. A summary of the replicate (two samples from each site) measurements of TPH, TRH, BTEX and naphthalene is provided in Table 5, which were all below LoR. There were no exceedances of the HEPA and MEPA EQGs as all measurements were below LoR.

Table 5 TPH, TRH, BTEX and naphthalene measurements of replicate mid-depth water samples.

Analyte Group	Analyte	Units	HEPA EQG	MEPA EQG	H-W	H-Wa	H-E	H-Ea	H-B2	H-B2a	H-B3	H-B3a	R-W	R-Wa	R-E	R-Ea
TPH	C6-C9 TPH	µg/L	-		<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
TRH	C6-C10 TRH	µg/L	-		<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	C6-C10 TRH minus BTEX	µg/L	-		<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
BTEX	Benzene	µg/L	500	900	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Toluene	µg/L	-		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Ethylbenzene	µg/L	-		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	meta- & para-Xylene	µg/L	-		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	ortho-Xylene	µg/L	-		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Total Xylenes	µg/L	-		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Sum of BTEX	µg/L	-		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PAH	Naphthalene	µg/L	50	90	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5

4.3.2.1 QA/QC

All replicate measurements of TPH, TRH, BTEX and naphthalene at each site (and across all sites) were below LoR. Hence the RPD is 0% for all replicate measurements across all sites, clearly below the 50% acceptability metric (NAGD 2009).

Laboratory QA/QC (i.e. holding time, laboratory duplicates, method blank, laboratory control spike, matrix spike) was within acceptable limits (see QCR and QA/QC-CA in Appendix B).

4.4 Sediment quality

4.4.1 Metals/metalloids, TKN, TP and TOC

Appendix C provides the CoC and sediment quality data report from the primary laboratory (MAFRL), and Appendix D provides the CoC, CoA and QCR of the secondary laboratory (ALS) for metals/metalloids, TKN, TP and TOC of the sediment samples. A summary of the triplicate (three sediment grab samples from each site) measurements of metals/metalloids, TKN, TP and TOC are provided in Table 6. There were no exceedances of the HEPA and MEPA EQGs.

4.4.1.1 QA/QC

The relative standard deviations (RSDs) of triplicate measurements were below or equal to 50% (measure of acceptable variability between replicates. i.e. NAGD [2009]) except for Cd at site H-E with a 57% RSD.

Most ALS QA/QC metrics (i.e. laboratory duplicates, method blank, laboratory control spike, matrix spike) were within acceptable limits[3] (see QCR in Appendix D).

[3] Moisture content exceeded the holding time by 1 day, no meaningful analytes exceed holding times.

Table 6 Organic analyte (TPH, TRH, BTEX and naphthalene) measurements of replicate mid-depth water samples.

Analyte	Units	LoR	HEPA EQG	MEPA EQG	H-W	H-Wa	H-Wb	H-E	H-Ea	H-Eb	H-B2	H-B2a	H-B2b	H-B3	H-B3a	H-B3b	R-E	R-Ea	R-Eb
Antimony (Sb)	mg/kg	<2	2	25	<2	<2	<2	3	2	5	<2	<2	<2	<2	<2	<2	<2	<2	<2
Arsenic (As)	mg/kg	<2	20	70	4	4	4	5	4	6	4	4	4	2	3	2	5	5	4
Cadmium (Cd)	mg/kg	<0.1	1.5	10	0.2	0.2	0.2	<0.1	<0.1	0.3	0.2	0.1	0.1	0.1	<0.1	0.1	<0.1	0.2	0.1
Chromium (Cr)	mg/kg	<0.2	80	370	34	32	33	13	16	14	9	7.7	7.2	8.5	9.2	8.1	34	30	34
Copper (Cu)	mg/kg	<0.2	65	270	9.3	8.8	9.1	1.9	2.9	1.7	1.1	0.6	0.6	2	2.2	1.8	9.4	8.3	9.6
Cobalt (Co)	mg/kg	<0.2	-	-	6.7	6.2	6.5	2	2.6	1.8	1.2	0.6	0.6	2	2.2	1.9	6.7	6.1	6.9
Lead (Pb)	mg/kg	<1	50	220	7	7	7	4	5	5	3	3	3	3	3	3	7	6	6
Mercury (Hg)	mg/kg	<0.01	0.15	1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel (Ni)	mg/kg	<0.7	21	52	13	12	13	2.8	4.3	2.4	2.1	1.4	1.3	3.3	3.5	3.1	13	12	13
Silver (Ag)	mg/kg	<1	1	4	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Zinc (Zn)	mg/kg	<0.5	200	410	24	22	23	4.6	7.8	3.5	2.8	1.4	1.4	5.4	5.8	5	23	21	24
TKN	mg/kg	<0.1	-	-	1.7	1.4	1.7	0.3	0.4	0.3	0.3	0.2	0.2	0.5	0.4	0.4	1.7	1.4	1.9
TP	mg/kg	<0.05	-	-	0.48	0.44	0.46	0.18	0.19	0.16	0.27	0.26	0.25	0.31	0.3	0.31	0.49	0.56	0.5
TOC	% C	<0.1	-	-	0.7	0.7	0.7	0.1	0.2	<0.1	0.1	<0.1	<0.1	0.2	0.2	0.2	0.7	0.6	0.7

4.4.2 PAH, TRH, TPH, BTEX and TBT

Appendix D and Appendix E provide the CoC, CoA and QCR[4] documentation of sediment samples for PAH, TRH, TPH, BTEX and TBT from the primary (ALS) and secondary (Eurofinns) laboratories, respectively. A summary of the primary laboratory analyses of the triplicate (three samples from each site) measurements of PAH, TRH, TPH, BTEX and TBT is provided in Table 7 where all of the analytes were below LoR. There were no exceedances of the HEPA EQG for organics at any of the HEPA sites as all measurements were below LoR.

Table 7 ***Maximum concentration and in parentheses the average and standard deviation of triplicate primary sediment samples at each site of organics.***

Analyte Group	Analyte	Units	HEPA EQG	MEPA EQG	LoR	All Measurements
PAH	Naphthalene	mg/kg	-	-	<0.5	<0.5
	Acenaphthylene	mg/kg	-	-	<0.5	<0.5
	Acenaphthene	mg/kg	-	-	<0.5	<0.5
	Fluorene	mg/kg	-	-	<0.5	<0.5
	Phenanthrene	mg/kg	-	-	<0.5	<0.5
	Anthracene	mg/kg	-	-	<0.5	<0.5
	Fluoranthene	mg/kg	-	-	<0.5	<0.5
	Pyrene	mg/kg	-	-	<0.5	<0.5
	Benz(a)anthracene	mg/kg	-	-	<0.5	<0.5
	Chrysene	mg/kg	-	-	<0.5	<0.5
	Benzo(b+j)fluoranthene	mg/kg	-	-	<0.5	<0.5
	Benzo(k)fluoranthene	mg/kg	-	-	<0.5	<0.5
	Benzo(a)pyrene	mg/kg	-	-	<0.5	<0.5
	Indeno(1.2.3.cd)pyrene	mg/kg	-	-	<0.5	<0.5
	Dibenz(a.h)anthracene	mg/kg	-	-	<0.5	<0.5
	Benzo(g.h.i)perylene	mg/kg	-	-	<0.5	<0.5
	Sum of PAHs	mg/kg	10	50	<0.5	<0.5
TRH NEPM 2013	>C10 - C16 Fraction	mg/kg	-	-	<3	<3
	>C16 – C34 Fraction	mg/kg	-	-	<3	<3
	>C34 - C40 Fraction	mg/kg	-	-	<3	<3
	>C10 - C40 Fraction (sum)	mg/kg	-	-	<3	<3
	>C10 - C16 Fraction minus Naphthalene	mg/kg	-	-	<3	<3
TPH	C6 - C9 Fraction	mg/kg	-	-	<3	<3
	C10 - C14 Fraction	mg/kg	-	-	<3	<3
	C15 - C28 Fraction	mg/kg	-	-	<3	<3
	C29 - C36 Fraction	mg/kg	-	-	<3	<3
	C10 - C36 Fraction (sum)	mg/kg	280	550	<3	<3
TRH	C6 - C10 Fraction	mg/kg	-	-	<3	<3
	C6 - C10 Fraction minus BTEX	mg/kg	-	-	<3	<3
BTEXN	Benzene	mg/kg	-	-	<0.2	<0.2
	Toluene	mg/kg	-	-	<0.2	<0.2
	Ethylbenzene	mg/kg	-	-	<0.2	<0.2
	meta- & para-Xylene	mg/kg	-	-	<0.2	<0.2

[4] ALS also provided a QA/QC-CA.

Analyte Group	Analyte	Units	HEPA EQG	MEPA EQG	LoR	All Measurements
	ortho-Xylene	mg/kg	-	-	<0.2	<0.2
	Total Xylenes	mg/kg	-	-	<0.2	<0.2
	Sum of BTEX	mg/kg	-	-	<0.2	<0.2
	Naphthalene	mg/kg	-	-	<0.2	<0.2
-	TBT	µg/kg	9	70	<0.5	<0.5

4.4.2.1 QA/QC of organic analytes

All replicate measurements at each site (and in fact across all sites) were below LoR. Hence the relative percentage differences (RPD) of all replicate samples were 0%.

PAH, TRH, TPH, BTEX and TBT analytes of the three field splits of sample H-B2sa were below LoR.

ALS and Eurofinns QA/QC metrics (i.e. laboratory duplicates, method blank, laboratory control spike, matrix spike) were within acceptable limits (see QCR and QA/QC-CA in Appendix D and Appendix E).

4.4.3 Particle size distribution

Appendix F provides the particle size analysis reports of the measured particle size distributions (PSDs) of the 15 sediment samples. Table 8 provides the average PSD at each site and standard deviation of the triplicate sample measurements. Figure 3 illustrate graphically the PSD across particle size intervals and cumulatively of individual samples and averages across triplicates at each site. The PSD across sites can be characterised as low clay content (0-3%), low (1-6% at bays and eastern MEPA-HEPA boundary) to moderate (16-17% at western MEPA-HEPA boundary and eastern reference site) silt content, moderate (9-30% at bays and eastern MEPA-HEPA boundary) to high (57-65% at western MEPA-HEPA boundary and western reference site) sand content, and moderate (18-26% at western MEPA-HEPA boundary and eastern reference site) to high (66-87% at bays and eastern MEPA-HEPA boundary) gravel content.

In short, gravels are the dominant sediment type at the bays and eastern MEPA-HEPA boundary sites, while sand is the dominant sand type at the western MEPA-HEPA boundary and eastern reference sites.

Table 8 Summary of PSD results.

Wentworth Size Classifications	H-B2	H-B3	H-E	H-W	R-E
Total Clay % (0-4µm)	1.1%±0.7%	2.6%±0.2%	5.3%±2.5%	16.8%±0.8%	16.0%±1.9%
Very Fine Silt % (4-8µm)	0.8%±0.4%	1.4%±0.1%	3.7%±1.4%	10.2%±0.3%	9.4%±1.1%
Fine Silt % (8-16µm)	1.2%±0.5%	2.5%±0.2%	5.2%±1.7%	12.6%±0.2%	11.3%±1.3%
Medium Silt % (16-31µm)	1.7%±0.9%	5.2%±0.4%	7.0%±2.7%	17.7%±0.4%	15.5%±1.7%
Course Silt % (31-63µm)	4.9%±3.7%	20.4%±0.7%	10.5%±3.6%	24.4%±0.9%	20.9%±1.7%
Very Fine sand % (63-125µm)	10.8%±4.2%	40.4%±0.4%	14.3%±1.1%	14.7%±0.4%	14.9%±0.2%
Fine sand % (125-250µm)	18.3%±3.8%	24.4%±1.1%	18.8%±1.5%	2.8%±0.2%	5.4%±1.3%
Medium sand % (250-500µm)	17.7%±5.5%	2.6%±0.3%	16.7%±2.5%	0.7%±0.3%	2.9%±2.4%
Coarse sand % (500-1000µm)	26.3%±3.0%	0.3%±0.1%	11.6%±5.6%	0.1%±0.0%	1.9%±2.3%
Very Coarse sand % (1000-2000µm)	14.1%±1.8%	0.1%±0.0%	4.4%±2.7%	0.0%±0.0%	1.0%±1.2%
Total Clay % (0-4µm)	**3.0%±1.3%**	**0.1%±0.1%**	**2.6%±1.4%**	**0.0%±0.0%**	**0.8%±0.7%**
Total Silt (4-63µm)	**1.1%±0.7%**	**2.6%±0.2%**	**5.3%±2.5%**	**16.8%±0.8%**	**16.0%±1.9%**
Total Sand (63-2000µm)	**8.7%±5.5%**	**29.5%±1.4%**	**26.4%±9.4%**	**64.9%±1.0%**	**57.1%±5.8%**
Total Gravels (>2000µm)	**87.1%±6.8%**	**67.8%±1.6%**	**65.8%±11.0%**	**18.2%±0.4%**	**26.1%±7.0%**

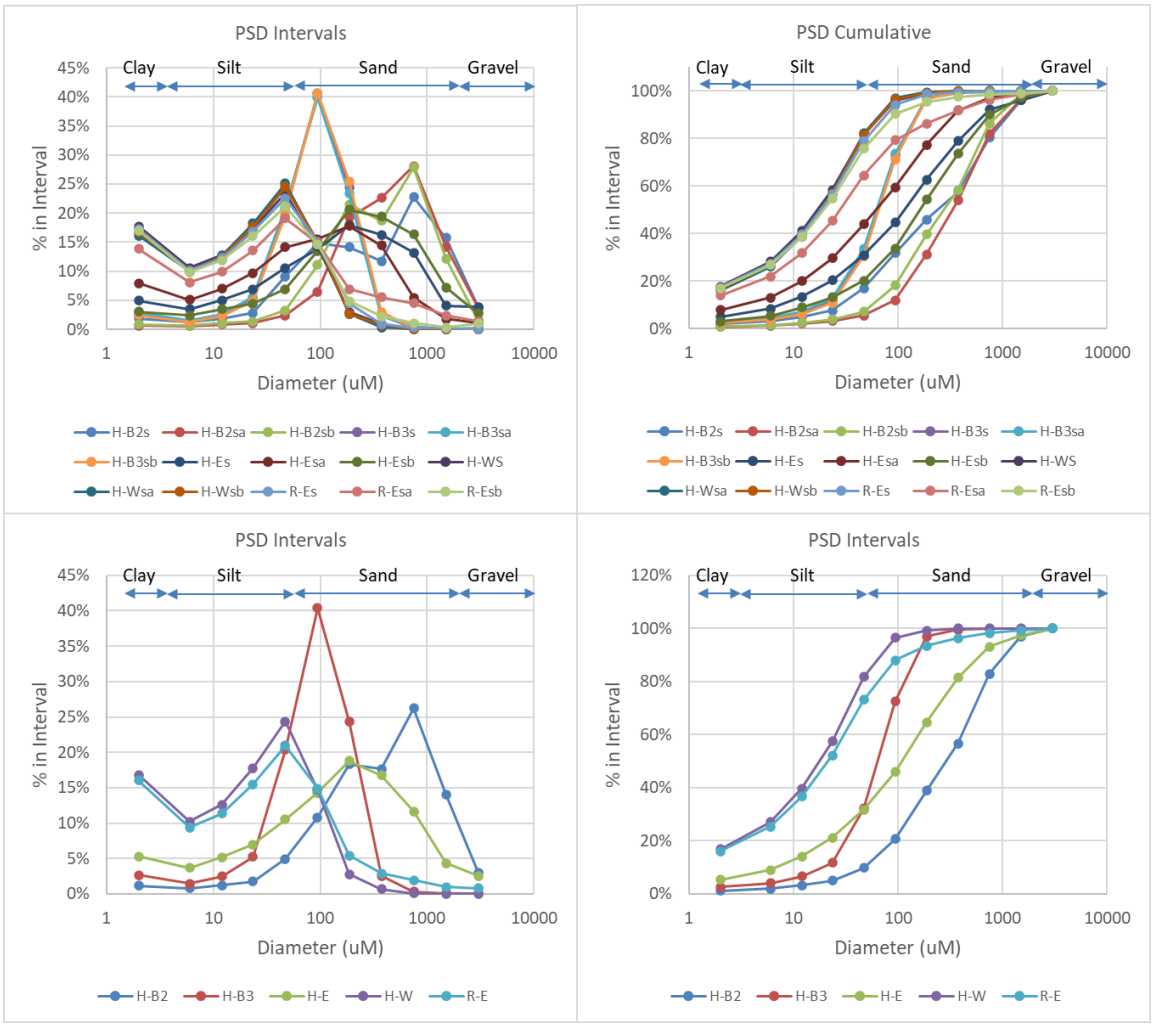

Figure 3 ***Proportion of PSD in particle size intervals (bins) per sample (upper left) and average per site (lower left), and cumulative PSD per sample (upper right) and averages per site (lower right).***

5. Summary

A summary of the findings of the February 2025 survey include:

- Physico-chemical profiles through the water column during neap tides documented well-mixed waters through the upper 20 m with high dissolved oxygen and low turbidity levels.
- Metals and metalloids in the marine waters were below the MEPA EQGs, and only exceeded the HEPA EQGs, at two sites for copper (i.e. Bay 3 and a eastern reference site) and one site for zinc (i.e. an eastern reference site). On a preliminary basis, the occurrence of these exceedances at distance from the mining and port activity hub of Cockatoo Island suggests that there may be natural variability in zinc and copper levels that may be above the HEPA EQGs.
- TPH, TRH, BTEX and naphthalene in marine waters were below the laboratory Limits of Reporting (LoRs), HEPA EQGs and MEPA EQGs. No petroleum-based contamination of the marine waters was detected during the survey.
- The sediments are comprised primarily of gravel and sand in the locale of the Proposal.
- Metals and metalloids of the marine sediments were below both the HEPA and MEPA EQGs at all sites and for all samples. This indicates that current and past mining and port activity has not degraded sediment quality in the locale of the Proposal.
- TRH, TPH, PAH, BTEX and TBT of the marine sediments were below LoRs, HEPA EQGs and MEPA EQGs at all sites and for all samples. This indicates that current and past mining and port activity has not caused any detectable degradation to sediment quality from petroleum-based contamination.

The February 2025 survey indicates an appropriate ANZG (2018) classification of ‘slightly disturbed’ for the water and sediment quality at the Proposal site. This classification is based on the past and ongoing mining and port activities at Cockatoo Island. The February 2025 survey supports the recommended Environmental Quality Plan spatial delineation of the HEPA and MEPA for the Proposal in GHD (2025).

6. References

ANZG (2018) Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT, Australia. Available at **www.waterquality.gov.au/anz-guidelines**

GHD (2025) Kimberly Supply Chain Cluster EIA: Operational Environmental Management Plan (OEMP). Prepared for Crestlink Pty Ltd. 28 March 2025.

NAGD (National Assessment Guidelines for Dredging) (2009) Commonwealth of Australia, Canberra.

Appendices

Appendix A

MAFRL documentation (CoC, water quality data report) for metals/metalloids and nutrients in water

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

GHD
Level 10, 999 Hay Street, Perth WA 6000 | PO Box 3106, Perth WA 6832 | Reception Ph: 08 6222 8222

Project ID 12662246	**PO Number** (to be invoiced) 12662246
Laboratory Quote No. # 25-7	**Turnaround Time** Standard
Project Manager (Invoice) & GHD accounts Invoice to : AccountsPayableAU@ghd.com	**Email Address (Results)** GHD.LabReports@ghd.com Charlie.Rolfe@ghd.com Jose.Romero@ghd.com Tristan.Sleigh@ghd.com

Laboratory:
Address:
Laboratory Contact:

GHD Sample ID	Lab Sample ID	Date	Time	Container: Sample Matrix S-Soil/SL-Sludge/W-Water/A-Air	Container: Type B-Bottle/J-Jar/V-Vial/Bag/G-Glass/P-Plastic	Container: Preservative Unpreserved/HCl/H2SO4/HNO3/Other	Container: No	Analyses: TN, NO3, NH4, TP, FRP	Analyses: Turbidity and salinity	Analyses: Metals (Cd, CrIII, CrIV, Co, Cu, Pb, Hg, Ni, Ag, V, Zn)	Analyses: HOLD	Remarks
H-W		24/02/25		Water	Var	Var	7	X	X	X		
H-E		24/02/25		Water	Var	Var	7	X	X	X		
H-B2		24/02/25		Water	Var	Var	7	X	X	X		
B-B3		24/02/25		Water	Var	Var	7	X	X	X		
R-W		24/02/25		Water	Var	Var	7	X	X	X		
R-E		24/02/25		Water	Var	Var	7	X	X	X		
H-Wa		24/02/25		Water	Var	Var	7	X	X	X		
H-Ea		24/02/25		Water	Var	Var	7	X	X	X		
H-B2a		24/02/25		Water	Var	Var	7	X	X	X		
B-B3a		24/02/25		Water	Var	Var	7	X	X	X		
R-Wa		24/02/25		Water	Var	Var	7	X	X	X		
R-Ea		24/02/25		Water	Var	Var	7	X	X	X		

Sampled by: Charlie Rolfe	Date/Time: 24/02/2025	Relinquished by: Charlie Rolfe	Date/Time: 25/02/2025 15:00
Received by: B.Wrenczyga	Date/Time: 25/2/25	Relinquished by:	Date/Time:

Samples in good condition chilled 0-6°C Job: GHD25-1.

Marine and Freshwater Research Laboratory
Tel: 08 93602907 Address: 90 South St, Murdoch, WA, 6150

NATA Accreditation Number: 10603
Accredited for compliance with ISO/IEC 17025 - Testing.

Murdoch University

WATER QUALITY DATA

Contact: Jose Romero
Customer: GHD
Address: 999 Hay St, Perth, WA 6000

Date of Issue: 24/03/2025
Date Received: 25/02/2025
Our Reference: GHD25-1
Your Reference: 12662246

METHOD	Sampling	Sample	9200	5060	2000	4100	2100	4700	2700	ICP006
SAMPLE CODE	Date	Type	SALINITY	Turbidity	AMMONIA	ORTHO-P	NO3+NO2	TOTAL-P	TOTAL-N	Hg
			psu	NTU	µg.N/L	µg.P/L	µg.N/L	µg.P/L	µg.N/L	mg/L
Reporting Limit			<0.1	<0.1	<3	<2	<2	<5	<50	<0.0001
Analysis Date			18/03/2025	25/02/2025	6/03/2025	6/03/2025	6/03/2025	7/03/2025	7/03/2025	11/03/2025
File			250318	250225	25030601	25030601	25030601	25030701	25030701-2101	25031102
H-W	24/02/2025	Marine	34.5	0.8	73	9	5	17	200	<0.0001
H-Wa	24/02/2025	Marine	34.5	0.7	70	8	11	17	250	<0.0001
H-E	24/02/2025	Marine	34.4	1.0	180	8	38	17	360	<0.0001
H-Ea	24/02/2025	Marine	34.5	0.8	50	9	11	17	290	<0.0001
H-B2	24/02/2025	Marine	34.4	0.8	3	6	5	16	170	<0.0001
H-B2a	24/02/2025	Marine	34.4	1.1	94	8	8	17	260	<0.0001
H-B3	24/02/2025	Marine	34.3	0.9	94	9	12	18	180	<0.0001
H-B3a	24/02/2025	Marine	34.3	1.5	21	8	6	17	180	<0.0001
R-Ws	24/02/2025	Marine	34.3	0.7	20	8	9	19	190	<0.0001
R-Wsa	24/02/2025	Marine	34.3	1.1	140	8	14	19	390	<0.0001
R-Es	24/02/2025	Marine	34.1	0.8	26	10	5	17	220	<0.0001
R-Esa	24/02/2025	Marine	34.0	0.4	22	9	2	18	160	<0.0001

Note: For results for compliance purposes uncertainity of measurement (MU) will sometimes affect the interpretation whether the result passes or fails the compliance limit.
Tables for measurement uncertainity are available online at www.mafrl.murdoch.edu.au
Hexavalent chromium is not tested as filtered chromium was not detected.

Signatory: Lirong Han
Date: 24/03/2025

The results only apply to the sample as received and to the sample tested.
Spare test items will be held for two months unless otherwise requested.

Marine and Freshwater Research Laboratory
Tel: 08 93602907 Address: 90 South St, Murdoch, WA, 6150

Accreditation Number: 10603
Accredited for compliance with ISO/IEC 17025 - Testing.

Murdoch University

WATER QUALITY DATA

Contact:
Customer:
Address:

Date of Issue: 24/03/2025
Date Received: 25/02/2025
Our Reference: GHD25-1
Your Reference: 12662246

METHOD SAMPLE CODE	Sampling Date	Sample Type	MS001 Filtered V µg/L	MS001 Filtered Cr µg/L	MS001 Filtered Co µg/L	MS001 Filtered Ni µg/L	MS001 Filtered Cu µg/L	MS001 Filtered Zn µg/L	MS001 Filtered Ag µg/L	MS001 Filtered Cd µg/L	MS001 Filtered Pb µg/L
Reporting Limit			<0.3	<0.2	<0.05	<0.3	<0.2	<1	<0.1	<0.1	<0.1
Analysis Date			12/03/2025	12/03/2025	12/03/2025	12/03/2025	12/03/2025	12/03/2025	12/03/2025	12/03/2025	12/03/2025
File			25031201	25031201	25031201	25031201	25031201	25031201	25031201	25031201	25031201
H-W	24/02/2025	Marine	1.7	<0.2	<0.05	<0.3	<0.2	<1	<0.1	<0.1	<0.1
H-Wa	24/02/2025	Marine	1.8	<0.2	<0.05	<0.3	<0.2	<1	<0.1	<0.1	<0.1
H-E	24/02/2025	Marine	1.8	<0.2	<0.05	0.3	0.2	<1	<0.1	<0.1	<0.1
H-Ea	24/02/2025	Marine	1.8	<0.2	<0.05	<0.3	<0.2	<1	<0.1	<0.1	<0.1
H-B2	24/02/2025	Marine	1.8	<0.2	<0.05	<0.3	<0.2	<1	<0.1	<0.1	<0.1
H-B2a	24/02/2025	Marine	1.8	<0.2	<0.05	<0.3	<0.2	<1	<0.1	<0.1	<0.1
H-B3	24/02/2025	Marine	1.9	<0.2	<0.05	0.5	0.3	1	<0.1	<0.1	<0.1
H-B3a	24/02/2025	Marine	1.8	<0.2	<0.05	0.5	0.3	1	<0.1	<0.1	<0.1
R-Ws	24/02/2025	Marine	1.9	<0.2	<0.05	<0.3	<0.2	1	<0.1	<0.1	<0.1
R-Wsa	24/02/2025	Marine	1.8	<0.2	<0.05	<0.3	<0.2	3	<0.1	<0.1	<0.1
R-Es	24/02/2025	Marine	1.8	<0.2	<0.05	1.7	0.4	5	<0.1	<0.1	0.2
R-Esa	24/02/2025	Marine	1.9	<0.2	<0.05	0.5	0.7	2	<0.1	<0.1	0.3

Signatory: Lirong Han
Date: 24/03/2025

The results only apply to the sample as received and to the sample tested.
Spare test items will be held for two months unless otherwise requested.

Appendix B

ALS documentation (CoC, CoA, QCR, QA/QC-CA) for TPH, TRH, BTEX and naphthalene in water

CHAIN OF CUSTODY RECORD
AND ANALYSIS REQUEST

GHD
Level 10, 999 Hay Street
Perth WA 6000

PO Box 3106
Perth WA 6832

Reception Ph: 08 6222 8222

Page 1 of 1

Project ID 12662246	**PO Number** (to be invoiced) 12662246
Laboratory Quote No. # 25-7 EP25MARFRE0001_V2	**Turnaround Time** Standard
Project Manager (Invoice) & GHD accounts Invoice to : AccountsPayableAU@ghd.com	**Email Address (Results)** GHD.LabReports@ghd.com Charlie.Rolfe@ghd.com Jose.Romero@ghd.com Tristan.Sleigh@ghd.com

Laboratory: ALS Environmental
Address: 26 Rigali Way, Wangara WA 6065
Laboratory Contact:

GHD Sample ID	Lab Sample ID	Date	Time	Sample Matrix S-Soil/Sl-Sludge/W-Water/A-Air	Container: Type B-Bottle/J-Jar/V-Vial/Reg/G-Glass/P-Plastic	Container: Preservative Unpreserved/HCl/H2SO4/HNO3/Other	Container: No	Analyses: BTEXN	Analyses: HOLD	Remarks
H-W	1	24/02/25		Water	Vials	H2S04	2	X		
H-E	2	24/02/25		Water	Vials	H2S04	2	X		
H-B2	3	24/02/25		Water	Vials	H2S04	2	X		
B-B3	4	24/02/25		Water	Vials	H2S04	2	X		
R-W	5	24/02/25		Water	Vials	H2S04	2	X		
R-E	6	24/02/25		Water	Vials	H2S04	2	X		
H-Wa	7	24/02/25		Water	Vials	H2S04	2	X		
H-Ea	8	24/02/25		Water	Vials	H2S04	2	X		
H-B2a	9	24/02/25		Water	Vials	H2S04	2	X		
B-B3a	10	24/02/25		Water	Vials	H2S04	2	X		
R-Wa	11	24/02/25		Water	Vials	H2S04	2	X		
R-Ea	12	24/02/25		Water	Vials	H2S04	2	X		

Environmental Division
Perth
Work Order Reference
EP2502820

Telephone : -- 61-8-9406 1301

Sampled by: Charlie Rolfe	Date/Time: 24/02/2025	Relinquished by: Charlie Rolfe	Date/Time: 25/02/2025 15:00
Received by: Brian	Date/Time: 26/2@1320	Relinquished by: K. Wenzlugan (MAFRL)	Date/Time: 26/2/25

CERTIFICATE OF ANALYSIS

Work Order	: **EP2502820**	Page	: 1 of 6
Amendment	: **1**		
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: Charlie Rolfe	Contact	: Angel Tam
Address	: 999 HAY STREET PERTH WA, AUSTRALIA 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: 12662246	Date Samples Received	: 26-Feb-2025 13:20
Order number	: 12662246	Date Analysis Commenced	: 27-Feb-2025
C-O-C number	: ----	Issue Date	: 10-Mar-2025 15:53
Sampler	: Charlie Rolfe		
Site	: ----		
Quote number	: EP25GHDSER0001		
No. of samples received	: 12		
No. of samples analysed	: 12		

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*
John Horwood	Organic Supervisor	Perth Organics, Wangara, WA

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.

- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- Amendment 10/03/2025: This report has been amended as a result of a request to change sample identification numbers (IDs) received from Charlie Rolfe on 10/03/2025, for samples EP2502820-004 & 010. All analysis results are as per the previous report.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	H-W	H-E	H-B2	H-B3	R-W
			Sampling date / time	24-Feb-2025 00:00	24-Feb-2025 00:00	24-Feb-2025 00:00	24-Feb-2025 00:00	24-Feb-2025 00:00
Compound	CAS Number	LOR	Unit	EP2502820-001	EP2502820-002	EP2502820-003	EP2502820-004	EP2502820-005
				Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
^ Total Xylenes	----	2	µg/L	<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	**108**	**110**	**105**	**111**	**111**
Toluene-D8	2037-26-5	2	%	**91.6**	**92.0**	**93.3**	**90.9**	**93.6**
4-Bromofluorobenzene	460-00-4	2	%	**104**	**105**	**103**	**103**	**100**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	R-E	H-Wa	H-Ea	H-B2a	H-B3a
			Sampling date / time	24-Feb-2025 00:00	24-Feb-2025 00:00	24-Feb-2025 00:00	24-Feb-2025 00:00	24-Feb-2025 00:00
Compound	CAS Number	LOR	Unit	EP2502820-006	EP2502820-007	EP2502820-008	EP2502820-009	EP2502820-010
				Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
^ Total Xylenes	----	2	µg/L	<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	**90.6**	**93.4**	**105**	**109**	**112**
Toluene-D8	2037-26-5	2	%	**97.0**	**96.1**	**92.3**	**91.0**	**89.6**
4-Bromofluorobenzene	460-00-4	2	%	**96.0**	**98.9**	**96.2**	**98.6**	**95.5**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	R-Wa	R-Ea	----	----	----
				Sampling date / time	24-Feb-2025 00:00	24-Feb-2025 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EP2502820-011	EP2502820-012	--------	--------	--------
					Result	Result	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L		<20	<20	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	----	----	----
Toluene	108-88-3	2	µg/L		<2	<2	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	----	----	----
^ **Total Xylenes**	----	2	µg/L		<2	<2	----	----	----
^ **Sum of BTEX**	----	1	µg/L		<1	<1	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**114**	**116**	----	----	----
Toluene-D8	2037-26-5	2	%		**89.7**	**87.7**	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**94.8**	**97.0**	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	61	141
Toluene-D8	2037-26-5	73	126
4-Bromofluorobenzene	460-00-4	60	125

QUALITY CONTROL REPORT

Work Order	: **EP2502820**	Page	: 1 of 3
Amendment	: **1**		
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: Charlie Rolfe	Contact	: Angel Tam
Address	: 999 HAY STREET PERTH WA, AUSTRALIA 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: 12662246	Date Samples Received	: 26-Feb-2025
Order number	: 12662246	Date Analysis Commenced	: 27-Feb-2025
C-O-C number	: ----	Issue Date	: 10-Mar-2025
Sampler	: Charlie Rolfe		
Site	: ----		
Quote number	: EP25GHDSER0001		
No. of samples received	: 12		
No. of samples analysed	: 12		

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*
John Horwood	Organic Supervisor	Perth Organics, Wangara, WA

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 (%)*
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6405054)									
EP2502813-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP2502820-010	H-B3a	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6405054)									
EP2502813-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP2502820-010	H-B3a	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 6405054)									
EP2502813-001	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
EP2502820-010	H-B3a	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: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6405054)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	111	73.6	113
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6405054)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	113	73.9	115
EP080: BTEXN (QCLot: 6405054)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	100	84.1	114
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	103	81.0	115
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	108	84.4	113
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	110	84.3	114
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	110	86.5	111
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	104	77.0	118

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 (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6405054)							
EP2502820-001	H-W	EP080: C6 - C9 Fraction	----	240 µg/L	122	77.0	137
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6405054)							
EP2502820-001	H-W	EP080: C6 - C10 Fraction	C6_C10	290 µg/L	123	77.0	137
EP080: BTEXN (QCLot: 6405054)							
EP2502820-001	H-W	EP080: Benzene	71-43-2	20 µg/L	104	77.0	122
		EP080: Toluene	108-88-3	20 µg/L	111	73.5	126

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2502820**	Page	: 1 of 4
Amendment	: **1**		
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: Charlie Rolfe	Telephone	: +61-8-9406 1301
Project	: 12662246	Date Samples Received	: 26-Feb-2025
Site	: ----	Issue Date	: 10-Mar-2025
Sampler	: Charlie Rolfe	No. of samples received	: 12
Order number	: 12662246	No. of samples analysed	: 12

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

Analysis Holding Time Compliance

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

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

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

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

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons							
Amber VOC Vial - Sulfuric Acid (EP080)							
H-W, H-E, H-B2, H-B3, R-W, R-E, H-Wa, H-Ea, H-B2a, H-B3a, R-Wa, R-Ea	**24-Feb-2025**	**27-Feb-2025**	10-Mar-2025	✓	**27-Feb-2025**	10-Mar-2025	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber VOC Vial - Sulfuric Acid (EP080)							
H-W, H-E, H-B2, H-B3, R-W, R-E, H-Wa, H-Ea, H-B2a, H-B3a, R-Wa, R-Ea	**24-Feb-2025**	**27-Feb-2025**	10-Mar-2025	✓	**27-Feb-2025**	10-Mar-2025	✓
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080)							
H-W, H-E, H-B2, H-B3, R-W, R-E, H-Wa, H-Ea, H-B2a, H-B3a, R-Wa, R-Ea	**24-Feb-2025**	**27-Feb-2025**	10-Mar-2025	✓	**27-Feb-2025**	10-Mar-2025	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
TRH Volatiles/BTEX	EP080	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
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*
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.

Appendix C

Primary laboratory (MAFRL) documentation (CoC, sediment quality report) for metals/metalloids, TKN, TP and TOC in sediments

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

GHD
Level 10, 999 Hay Street, Perth WA 6000
PO Box 3106, Perth WA 6832
Reception Ph: 08 6222 8222

Project ID 12662246	**PO Number** (to be invoiced) 12662246
Laboratory Quote No. # 25-7	**Turnaround Time** Standard
Project Manager (Invoice) & GHD accounts Invoice to : AccountsPayableAU@ghd.com	**Email Address (Results)** GHD.LabReports@ghd.com; Charlie.Rolfe@ghd.com; Jose.Romero@ghd.com; Tristan.Sleigh@ghd.com
Laboratory:	
Address:	
Laboratory Contact:	

GHD Sample ID	Lab Sample ID	Date	Time	Sample Matrix S-Soil/ SL-Sludge/ W-Water/ A-Air	Container: Type Bi-Bottle/J-Jar/V-Vial/Bag/G-Glass/P-Plastic	Container: Preservative Unpreserved/ HCl/ H2SO4/HNO3/Other	Container: No	Analyses: TKN, TN	TP	TOC	Metals	PSD – laser/sieve	HOLD	Remarks
H-Ws		24/02/25		Soil	Jar + Bag	No	3	X	X	X	X	X		
H-Es		24/02/25		Soil	Jar + Bag	No	3	X	X	X	X	X		
H-B2s		24/02/25		Soil	Jar + Bag	No	3	X	X	X	X	X		
H-B3s		24/02/25		Soil	Jar + Bag	No	3	X	X	X	X	X		
R-Es		24/02/25		Soil	Jar + Bag	No	3	X	X	X	X	X		
H-Wsa		24/02/25		Soil	Jar + Bag	No	3	X	X	X	X	X		
H-Esa		24/02/25		Soil	Jar + Bag	No	3	X	X	X	X	X		
H-B2sa		24/02/25		Soil	Jar + Bag	No	3	X	X	X	X	X		
H-B3sa		24/02/25		Soil	Jar + Bag	No	3	X	X	X	X	X		
R-Esa		24/02/25		Soil	Jar + Bag	No	3	X	X	X	X	X		
H-Wsb		24/02/25		Soil	Jar + Bag	No	3	X	X	X	X	X		
H-Esb		24/02/25		Soil	Jar + Bag	No	3	X	X	X	X	X		
H-B2sb		24/02/25		Soil	Jar + Bag	No	3	X	X	X	X	X		
H-B3sb		24/02/25		Soil	Jar + Bag	No	3	X	X	X	X	X		
R-Esb		24/02/25		Soil	Jar + Bag	No	3	X	X	X	X	X		

Sampled by: Charlie Rolfe	Date/Time: 26/02/2025	Relinquished by: Charlie Rolfe	Date/Time: 27 /02/2025 15:00
Received by: K. Wiencaryw	Date/Time: 1600	Relinquished by:	Date/Time: 27/02/2025

Samples Frozen <0°C

Job: GHD25-2

Marine and Freshwater Research Laboratory
Tel: 08 93602907 Address: 90 South St, Murdoch, WA, 6150

NATA Accreditation Number: 10603
Accredited for compliance with ISO/IEC 17025 - Testing.

Murdoch University

SEDIMENT DATA

Contact: Jose Romero
Customer: GHD
Address: 999 Hay St, Perth, WA 6000

Date of Issue: 26/03/2025
Date Received: 27/02/2025
Our Reference: GHD25-2

METHOD SAMPLE CODE	Sampling Date	Sample Type	ICP002 Total Ext Ag mg/kg	ICP002 Total Ext As mg/kg	ICP002 Total Ext Cd mg/kg	ICP002 Total Ext Co mg/kg	ICP002 Total Ext Cr mg/kg	ICP002 Total Ext Cu mg/kg	ICP002 Total Ext Ni mg/kg	ICP002 Total Ext Pb mg/kg	ICP002 Total Ext Sb mg/kg	ICP002 Total Ext Zn mg/kg	ICP007 Total Ext Hg mg/kg
Reporting Limit			**<1**	**<2**	**<0.1**	**<0.2**	**<0.2**	**<0.2**	**<0.7**	**<1**	**<2**	**<0.5**	**<0.01**
Analysis Date			**21/03/2025**	**21/03/2025**	**21/03/2025**	**21/03/2025**	**21/03/2025**	**21/03/2025**	**21/03/2025**	**21/03/2025**	**21/03/2025**	**21/03/2025**	**19/03/2025**
File			**25032101**	**25032101**	**25032101**	**25032101**	**25032101**	**25032101**	**25032101**	**25032101**	**25032101**	**25032101**	**25031903A**
H-WS	24/02/2025	Sediment	<1	4	0.2	6.7	34	9.3	13	7	<2	24	<0.01
H-Es	24/02/2025	Sediment	<1	5	<0.1	2.0	13	1.9	2.8	4	3	4.6	<0.01
H-B2s	24/02/2025	Sediment	<1	4	0.2	1.2	9.0	1.1	2.1	3	<2	2.8	<0.01
H-B3s	24/02/2025	Sediment	<1	2	0.1	2.0	8.5	2.0	3.3	3	<2	5.4	<0.01
R-Es	24/02/2025	Sediment	<1	5	<0.1	6.7	34	9.4	13	7	<2	23	<0.01
H-Wsa	24/02/2025	Sediment	<1	4	0.2	6.2	32	8.8	12	7	<2	22	<0.01
H-Esa	24/02/2025	Sediment	<1	4	<0.1	2.6	16	2.9	4.3	5	2	7.8	<0.01
H-B2sa	24/02/2025	Sediment	<1	4	0.1	0.6	7.7	0.6	1.4	3	<2	1.4	<0.01
H-B3sa	24/02/2025	Sediment	<1	3	<0.1	2.2	9.2	2.2	3.5	3	<2	5.8	<0.01
R-Esa	24/02/2025	Sediment	<1	5	0.2	6.1	30	8.3	12	6	<2	21	<0.01
H-Wsb	24/02/2025	Sediment	<1	4	0.2	6.5	33	9.1	13	7	<2	23	<0.01
H-Esb	24/02/2025	Sediment	<1	6	0.3	1.8	14	1.7	2.4	5	5	3.5	<0.01
H-B2sb	24/02/2025	Sediment	<1	4	0.1	0.6	7.2	0.6	1.3	3	<2	1.4	<0.01
H-B3sb	24/02/2025	Sediment	<1	2	0.1	1.9	8.1	1.8	3.1	3	<2	5.0	<0.01
R-Esb	24/02/2025	Sediment	<1	4	0.1	6.9	34	9.6	13	6	<2	24	<0.01

Note: For results for compliance purposes uncertainity of measurement (MU) will sometimes affect the interpretation whether the result passes or fails the compliance limit.
Tables for measurement uncertainity are available online at www.mafrl.murdoch.edu.au

Signatory: Vaughan Gregory
Date: 26/03/2025

The results only apply to the sample as received and to the sample tested.
Spare test items will be held for two months unless otherwise requested.

Marine and Freshwater Research Laboratory
Tel: 08 93602907 Address: 90 South St, Murdoch, WA, 6150

NATA Accreditation Number: 10603
Accredited for compliance with ISO/IEC 17025 - Testing.

Murdoch University

SEDIMENT DATA

Contact: Jose Romero
Customer: GHD
Address: 999 Hay St, Perth, WA 6000

Date of Issue: 26/03/2025
Date Received: 27/02/2025
Our Reference: GHD25-2

METHOD SAMPLE CODE	Sampling Date	Sample Type	2600 TKN mg.N/g	4500 TOTAL P mg.P/g	6200 TOC % C
Reporting Limit			<0.1	<0.05	<0.1
Analysis Date			25/03/2025	25/03/2025	21/03/2025
File			25032502	25032502	25032101
H-WS	24/02/2025	Sediment	1.7	0.48	0.7
H-Es	24/02/2025	Sediment	0.3	0.18	0.1
H-B2s	24/02/2025	Sediment	0.3	0.27	0.1
H-B3s	24/02/2025	Sediment	0.5	0.31	0.2
R-Es	24/02/2025	Sediment	1.7	0.49	0.7
H-Wsa	24/02/2025	Sediment	1.4	0.44	0.7
H-Esa	24/02/2025	Sediment	0.4	0.19	0.2
H-B2sa	24/02/2025	Sediment	0.2	0.26	<0.1
H-B3sa	24/02/2025	Sediment	0.4	0.30	0.2
R-Esa	24/02/2025	Sediment	1.4	0.56	0.6
H-Wsb	24/02/2025	Sediment	1.7	0.46	0.7
H-Esb	24/02/2025	Sediment	0.3	0.16	<0.1
H-B2sb	24/02/2025	Sediment	0.2	0.25	<0.1
H-B3sb	24/02/2025	Sediment	0.4	0.31	0.2
R-Esb	24/02/2025	Sediment	1.9	0.50	0.7

Signatory: Vaughan Gregory
Date: 26/03/2025

The results only apply to the sample as received and to the sample tested.
Spare test items will be held for two months unless otherwise requested.

Appendix D

ALS documentation (CoC, CoA, QCR, QA/QC-CA) for PAH, TRH, TPH, BTEX and TBT (primary laboratory) and metals/metalloids, TKN, TP and TOC (secondary laboratory) in sediments

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

GHD
Level 10, 999 Hay Street
Perth WA 6000
PO Box 3106
Perth WA 6832
Reception Ph: 08 6222 8222

Project ID 12662246	**PO Number** (to be invoiced) 12662246
Laboratory Quote No. EP25MARFRE0001_V2	**Turnaround Time** Standard
Project Manager (Invoice) & GHD accounts Invoice to : AccountsPayableAU@ghd.com	**Email Address (Results)** GHD.LabReports@ghd.com Charlie.Rolfe@ghd.com Jose.Romero@ghd.com Tristan.Sleigh@ghd.com

Laboratory:
Address:
Laboratory Contact:

GHD Sample ID	Lab Sample ID	Date	Time	Sample Matrix S-Soil/ SL-Sludge/ W-Water/ A-Air	Container Type B-Bottle/J-Jar/V-Vial/Bag/G-Glass/P-Plastic	Container Preservative Unpreserved/ HCl/ H2SO4/HNO3/Other	Container No	PAH	TBT	TRH	BTEXN	TKN, TN	TP	TOC	Metals	HOLD	Remarks
H-Ws	1	24/02/25		Soil	Jar	No	2	X	X	X	X						
H-Es	2	24/02/25		Soil	Jar	No	2	X	X	X	X						
H-B2s	3	24/02/25		Soil	Jar	No	2	X	X	X	X						
H-B3s	4	24/02/25		Soil	Jar	No	2	X	X	X	X						
R-Es	5	24/02/25		Soil	Jar	No	2	X	X	X	X						
H-Wsa	6	24/02/25		Soil	Jar	No	2	X	X	X	X						
H-Esa	7	24/02/25		Soil	Jar	No	2	X	X	X	X						
H-B2sa	8	24/02/25		Soil	Jar	No	2	X	X	X	X						
H-B3sa	9	24/02/25		Soil	Jar	No	2	X	X	X	X						
R-Esa	10	24/02/25		Soil	Jar	No	2	X	X	X	X						
H-Wsb	11	24/02/25		Soil	Jar	No	2	X	X	X	X						
H-Esb	12	24/02/25		Soil	Jar	No	2	X	X	X	X						
H-B2sb	13	24/02/25		Soil	Jar	No	2	X	X	X	X						
H-B3sb	14	24/02/25		Soil	Jar	No	2	X	X	X	X						
R-Esb	15	24/02/25		Soil	Jar	No	2	X	X	X	X						
Split1-Prim	16	24/02/25		Soil	Jar	No	4	X	X	X	X	x	x	x	x		

Environmental Division
Perth
Work Order Reference
EP2503192

Telephone : -- 61-8-9406 1301

Sampled by: Charlie Rolfe	Date/Time: 26/02/2025	Relinquished by: Charlie Rolfe	Date/Time: 27 /02/2025 15:00
Received by:	Date/Time: 4/3 12pm	Relinquished by: K. Wichczorek	Date/Time: 28/2/2025

CERTIFICATE OF ANALYSIS

Work Order	: **EP2503192**	Page	: 1 of 15
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: Charlie Rolfe	Contact	: Angel Tam
Address	: 999 HAY STREET PERTH WA, AUSTRALIA 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: 12662246	Date Samples Received	: 04-Mar-2025 12:00
Order number	: 12662246	Date Analysis Commenced	: 06-Mar-2025
C-O-C number	: ----	Issue Date	: 18-Mar-2025 19:49
Sampler	: Charlie Rolfe		
Site	: ----		
Quote number	: EP25GHDSER0001		
No. of samples received	: 16		
No. of samples analysed	: 16		

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*
Chris Lemaitre	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
John Horwood	Organic Supervisor	Perth Organics, Wangara, WA
Kim McCabe	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD

General Comments

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

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

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

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

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

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

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

- 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-SD: 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.

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	H-Ws	H-Es	H-B2s	H-B3s	R-Es
			Sampling date / time	24-Feb-2025 00:00	24-Feb-2025 00:00	24-Feb-2025 00:00	24-Feb-2025 00:00	24-Feb-2025 00:00
Compound	CAS Number	LOR	Unit	EP2503192-001	EP2503192-002	EP2503192-003	EP2503192-004	EP2503192-005
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**59.6**	**25.6**	**19.2**	**27.5**	**61.8**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	**1.2**	**1.2**	**1.2**	**1.2**	**1.2**
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
>C10 - C16 Fraction	----	3	mg/kg	<3	<3	<3	<3	<3
>C16 - C34 Fraction	----	3	mg/kg	<3	<3	<3	<3	<3
>C34 - C40 Fraction	----	5	mg/kg	<5	<5	<5	<5	<5
>C10 - C40 Fraction (sum)	----	3	mg/kg	<3	<3	<3	<3	<3

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	H-Ws	H-Es	H-B2s	H-B3s	R-Es
				Sampling date / time	24-Feb-2025 00:00	24-Feb-2025 00:00	24-Feb-2025 00:00	24-Feb-2025 00:00	24-Feb-2025 00:00
Compound	CAS Number	LOR	Unit		EP2503192-001	EP2503192-002	EP2503192-003	EP2503192-004	EP2503192-005
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
>C10 - C16 Fraction minus Naphthalene (F2)	----	3	mg/kg		<3	<3	<3	<3	<3
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	3	mg/kg		<3	<3	<3	<3	<3
C10 - C14 Fraction	----	3	mg/kg		<3	<3	<3	<3	<3
C15 - C28 Fraction	----	3	mg/kg		<3	<3	<3	<3	<3
C29 - C36 Fraction	----	5	mg/kg		<5	<5	<5	<5	<5
^ C10 - C36 Fraction (sum)	----	3	mg/kg		<3	<3	<3	<3	<3
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons									
C6 - C10 Fraction	C6_C10	3	mg/kg		<3	<3	<3	<3	<3
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	3.0	mg/kg		<3.0	<3.0	<3.0	<3.0	<3.0
EP080-SD: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	100-41-4	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
ortho-Xylene	95-47-6	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Naphthalene	91-20-3	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**76.9**	**75.4**	**69.4**	**72.8**	**71.6**
2-Chlorophenol-D4	93951-73-6	0.5	%		**76.5**	**74.2**	**69.3**	**72.2**	**70.6**
2.4.6-Tribromophenol	118-79-6	0.5	%		**66.8**	**50.6**	**60.8**	**60.1**	**52.0**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**69.8**	**71.5**	**65.1**	**67.4**	**65.8**
Anthracene-d10	1719-06-8	0.5	%		**108**	**106**	**104**	**104**	**90.1**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	H-Ws	H-Es	H-B2s	H-B3s	R-Es
			Sampling date / time	24-Feb-2025 00:00	24-Feb-2025 00:00	24-Feb-2025 00:00	24-Feb-2025 00:00	24-Feb-2025 00:00
Compound	CAS Number	LOR	Unit	EP2503192-001	EP2503192-002	EP2503192-003	EP2503192-004	EP2503192-005
				Result	Result	Result	Result	Result
EP075(SIM)T: PAH Surrogates - Continued								
4-Terphenyl-d14	1718-51-0	0.5	%	120	115	116	120	94.6
EP080-SD: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	105	106	113	110	103
Toluene-D8	2037-26-5	0.2	%	83.3	81.2	88.5	85.4	80.7
4-Bromofluorobenzene	460-00-4	0.2	%	90.0	89.7	92.9	93.7	90.0

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	H-Wsa	H-Esa	H-B2sa	H-B3sa	R-Esa
			Sampling date / time	24-Feb-2025 00:00	24-Feb-2025 00:00	24-Feb-2025 00:00	24-Feb-2025 00:00	24-Feb-2025 00:00
Compound	CAS Number	LOR	Unit	EP2503192-006	EP2503192-007	EP2503192-008	EP2503192-009	EP2503192-010
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**60.2**	**30.4**	**22.4**	**33.1**	**55.5**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	**1.2**	**1.2**	**1.2**	**1.2**	**1.2**
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
>C10 - C16 Fraction	----	3	mg/kg	<3	<3	<3	<3	<3
>C16 - C34 Fraction	----	3	mg/kg	<3	<3	<3	<3	<3
>C34 - C40 Fraction	----	5	mg/kg	<5	<5	<5	<5	<5
>C10 - C40 Fraction (sum)	----	3	mg/kg	<3	<3	<3	<3	<3

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	H-Wsa	H-Esa	H-B2sa	H-B3sa	R-Esa
				Sampling date / time	24-Feb-2025 00:00	24-Feb-2025 00:00	24-Feb-2025 00:00	24-Feb-2025 00:00	24-Feb-2025 00:00
Compound	CAS Number	LOR	Unit		EP2503192-006	EP2503192-007	EP2503192-008	EP2503192-009	EP2503192-010
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
>C10 - C16 Fraction minus Naphthalene (F2)	----	3	mg/kg		<3	<3	<3	<3	<3
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	3	mg/kg		<3	<3	<3	<3	<3
C10 - C14 Fraction	----	3	mg/kg		<3	<3	<3	<3	<3
C15 - C28 Fraction	----	3	mg/kg		<3	<3	<3	<3	<3
C29 - C36 Fraction	----	5	mg/kg		<5	<5	<5	<5	<5
^ C10 - C36 Fraction (sum)	----	3	mg/kg		<3	<3	<3	<3	<3
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons									
C6 - C10 Fraction	C6_C10	3	mg/kg		<3	<3	<3	<3	<3
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	3.0	mg/kg		<3.0	<3.0	<3.0	<3.0	<3.0
EP080-SD: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	100-41-4	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
ortho-Xylene	95-47-6	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Naphthalene	91-20-3	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**106**	**77.9**	**68.2**	**70.5**	**71.2**
2-Chlorophenol-D4	93951-73-6	0.5	%		**104**	**77.7**	**70.3**	**70.8**	**70.8**
2.4.6-Tribromophenol	118-79-6	0.5	%		**79.2**	**50.2**	**56.2**	**53.1**	**45.7**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**99.6**	**72.4**	**75.3**	**66.2**	**66.9**
Anthracene-d10	1719-06-8	0.5	%		**120**	**102**	**86.4**	**106**	**105**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	H-Wsa	H-Esa	H-B2sa	H-B3sa	R-Esa
			Sampling date / time	24-Feb-2025 00:00	24-Feb-2025 00:00	24-Feb-2025 00:00	24-Feb-2025 00:00	24-Feb-2025 00:00
Compound	CAS Number	LOR	Unit	EP2503192-006	EP2503192-007	EP2503192-008	EP2503192-009	EP2503192-010
				Result	Result	Result	Result	Result
EP075(SIM)T: PAH Surrogates - Continued								
4-Terphenyl-d14	1718-51-0	0.5	%	**125**	**106**	**101**	**111**	**102**
EP080-SD: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	**101**	**115**	**123**	**109**	**92.4**
Toluene-D8	2037-26-5	0.2	%	**74.8**	**91.5**	**92.8**	**75.8**	**72.1**
4-Bromofluorobenzene	460-00-4	0.2	%	**85.2**	**99.6**	**107**	**84.6**	**80.6**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	H-Wsb	H-Esb	H-B2sb	H-B3sb	R-Esb
			Sampling date / time	24-Feb-2025 00:00	24-Feb-2025 00:00	24-Feb-2025 00:00	24-Feb-2025 00:00	24-Feb-2025 00:00
Compound	CAS Number	LOR	Unit	EP2503192-011	EP2503192-012	EP2503192-013	EP2503192-014	EP2503192-015
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**60.6**	**21.7**	**18.0**	**34.8**	**60.1**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	**1.2**	**1.2**	**1.2**	**1.2**	**1.2**
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
>C10 - C16 Fraction	----	3	mg/kg	<3	<3	<3	<3	<3
>C16 - C34 Fraction	----	3	mg/kg	<3	<3	<3	<3	<3
>C34 - C40 Fraction	----	5	mg/kg	<5	<5	<5	<5	<5
>C10 - C40 Fraction (sum)	----	3	mg/kg	<3	<3	<3	<3	<3

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	H-Wsb	H-Esb	H-B2sb	H-B3sb	R-Esb
				Sampling date / time	24-Feb-2025 00:00	24-Feb-2025 00:00	24-Feb-2025 00:00	24-Feb-2025 00:00	24-Feb-2025 00:00
Compound	CAS Number	LOR	Unit		EP2503192-011	EP2503192-012	EP2503192-013	EP2503192-014	EP2503192-015
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
>C10 - C16 Fraction minus Naphthalene (F2)	----	3	mg/kg		<3	<3	<3	<3	<3
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	3	mg/kg		<3	<3	<3	<3	<3
C10 - C14 Fraction	----	3	mg/kg		<3	<3	<3	<3	<3
C15 - C28 Fraction	----	3	mg/kg		<3	<3	<3	<3	<3
C29 - C36 Fraction	----	5	mg/kg		<5	<5	<5	<5	<5
^ C10 - C36 Fraction (sum)	----	3	mg/kg		<3	<3	<3	<3	<3
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons									
C6 - C10 Fraction	C6_C10	3	mg/kg		<3	<3	<3	<3	<3
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	3.0	mg/kg		<3.0	<3.0	<3.0	<3.0	<3.0
EP080-SD: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	100-41-4	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
ortho-Xylene	95-47-6	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Naphthalene	91-20-3	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**66.8**	**73.4**	**66.7**	**73.9**	**74.9**
2-Chlorophenol-D4	93951-73-6	0.5	%		**66.7**	**73.4**	**66.6**	**72.7**	**74.8**
2.4.6-Tribromophenol	118-79-6	0.5	%		**52.8**	**43.8**	**49.1**	**63.7**	**56.8**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**61.5**	**67.4**	**64.0**	**66.3**	**68.5**
Anthracene-d10	1719-06-8	0.5	%		**103**	**118**	**99.0**	**113**	**98.4**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	H-Wsb	H-Esb	H-B2sb	H-B3sb	R-Esb
			Sampling date / time	24-Feb-2025 00:00	24-Feb-2025 00:00	24-Feb-2025 00:00	24-Feb-2025 00:00	24-Feb-2025 00:00
Compound	CAS Number	LOR	Unit	EP2503192-011	EP2503192-012	EP2503192-013	EP2503192-014	EP2503192-015
				Result	Result	Result	Result	Result
EP075(SIM)T: PAH Surrogates - Continued								
4-Terphenyl-d14	1718-51-0	0.5	%	**101**	**122**	**97.9**	**112**	**93.7**
EP080-SD: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	**83.3**	**118**	**116**	**107**	**108**
Toluene-D8	2037-26-5	0.2	%	**70.4**	**87.5**	**83.8**	**78.8**	**78.1**
4-Bromofluorobenzene	460-00-4	0.2	%	**71.9**	**95.0**	**94.2**	**87.3**	**88.4**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	Split1-Prim	----	----	----	----
				Sampling date / time	24-Feb-2025 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2503192-016	--------	--------	--------	--------
					Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		**17.6**	----	----	----	----
EG020-SD: Total Metals in Sediments by ICPMS									
Antimony	7440-36-0	0.50	mg/kg		**0.66**	----	----	----	----
Arsenic	7440-38-2	1.00	mg/kg		**3.54**	----	----	----	----
Cadmium	7440-43-9	0.1	mg/kg		<0.1	----	----	----	----
Chromium	7440-47-3	1.0	mg/kg		**5.9**	----	----	----	----
Copper	7440-50-8	1.0	mg/kg		<1.0	----	----	----	----
Cobalt	7440-48-4	0.5	mg/kg		**0.5**	----	----	----	----
Lead	7439-92-1	1.0	mg/kg		**2.0**	----	----	----	----
Nickel	7440-02-0	1.0	mg/kg		<1.0	----	----	----	----
Silver	7440-22-4	0.1	mg/kg		<0.1	----	----	----	----
Zinc	7440-66-6	1.0	mg/kg		**1.1**	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.01	mg/kg		<0.01	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	20	mg/kg		**140**	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	2	mg/kg		**228**	----	----	----	----
EP003: Total Organic Carbon (TOC) in Soil									
Total Organic Carbon	----	0.02	%		**0.11**	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg		<0.5	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg		<0.5	----	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	Split1-Prim	----	----	----	----
				Sampling date / time	24-Feb-2025 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2503192-016	--------	--------	--------	--------
					Result	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg		<0.5	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg		<0.5	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	----	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg		<0.5	----	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg		<0.5	----	----	----	----
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg		**0.6**	----	----	----	----
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg		**1.2**	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
>C10 - C16 Fraction	----	3	mg/kg		<3	----	----	----	----
>C16 - C34 Fraction	----	3	mg/kg		<3	----	----	----	----
>C34 - C40 Fraction	----	5	mg/kg		<5	----	----	----	----
>C10 - C40 Fraction (sum)	----	3	mg/kg		<3	----	----	----	----
>C10 - C16 Fraction minus Naphthalene (F2)	----	3	mg/kg		<3	----	----	----	----
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	3	mg/kg		<3	----	----	----	----
C10 - C14 Fraction	----	3	mg/kg		<3	----	----	----	----
C15 - C28 Fraction	----	3	mg/kg		<3	----	----	----	----
C29 - C36 Fraction	----	5	mg/kg		<5	----	----	----	----
^ **C10 - C36 Fraction (sum)**	----	3	mg/kg		<3	----	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	Split1-Prim	----	----	----	----
				Sampling date / time	24-Feb-2025 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2503192-016	--------	--------	--------	--------
					Result	----	----	----	----
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons									
C6 - C10 Fraction	C6_C10	3	mg/kg		<3	----	----	----	----
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	3.0	mg/kg		<3.0	----	----	----	----
EP080-SD: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	----	----	----	----
Toluene	108-88-3	0.2	mg/kg		<0.2	----	----	----	----
Ethylbenzene	100-41-4	0.2	mg/kg		<0.2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg		<0.2	----	----	----	----
ortho-Xylene	95-47-6	0.2	mg/kg		<0.2	----	----	----	----
^ **Total Xylenes**	----	0.5	mg/kg		<0.5	----	----	----	----
^ **Sum of BTEX**	----	0.2	mg/kg		<0.2	----	----	----	----
Naphthalene	91-20-3	0.2	mg/kg		<0.2	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**65.3**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		**64.7**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		**45.7**	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**60.0**	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%		**94.7**	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		**92.1**	----	----	----	----
EP080-SD: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**127**	----	----	----	----
Toluene-D8	2037-26-5	0.2	%		**91.7**	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		**97.6**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: SEDIMENT		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	57	119
2-Chlorophenol-D4	93951-73-6	52	130
2.4.6-Tribromophenol	118-79-6	40	132
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	53	139
Anthracene-d10	1719-06-8	68	124
4-Terphenyl-d14	1718-51-0	66	132
EP080-SD: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	70	130
Toluene-D8	2037-26-5	70	130
4-Bromofluorobenzene	460-00-4	70	130

Inter-Laboratory Testing

Analysis conducted by ALS Brisbane, NATA accreditation no. 825, site no. 818 (Chemistry / Biology).

(SOIL) EP003: Total Organic Carbon (TOC) in Soil

QUALITY CONTROL REPORT

Work Order	: **EP2503192**	Page	: 1 of 8
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: Charlie Rolfe	Contact	: Angel Tam
Address	: 999 HAY STREET PERTH WA, AUSTRALIA 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: 12662246	Date Samples Received	: 04-Mar-2025
Order number	: 12662246	Date Analysis Commenced	: 06-Mar-2025
C-O-C number	: ----	Issue Date	: 18-Mar-2025
Sampler	: Charlie Rolfe		
Site	: ----		
Quote number	: EP25GHDSER0001		
No. of samples received	: 16		
No. of samples analysed	: 16		

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*
Chris Lemaitre	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
John Horwood	Organic Supervisor	Perth Organics, Wangara, WA
Kim McCabe	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD

General Comments

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

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

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

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC
* = The final LOR has been raised due to dilution or other sample specific cause; adjusted LOR is shown in brackets. The duplicate ranges for Acceptable RPD% are applied to the final LOR where applicable.

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 (%)*
EG035T: Total Recoverable Mercury by FIMS (Low Level) (QC Lot: 6435294)									
EP2503192-016	Split1-Prim	EG035T-LL: Mercury	7439-97-6	0.01	mg/kg	<0.01	<0.01	0.0	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 6428822)									
EP2503192-001	H-Ws	EA055: Moisture Content	----	0.1 (1.0)*	%	59.6	57.4	3.9	0% - 20%
EP2503192-011	H-Wsb	EA055: Moisture Content	----	0.1 (1.0)*	%	60.6	59.9	1.2	0% - 20%
EG020-SD: Total Metals in Sediments by ICPMS (QC Lot: 6435295)									
EP2503192-016	Split1-Prim	EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
		EG020-SD: Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
		EG020-SD: Antimony	7440-36-0	0.5	mg/kg	0.66	<0.50	28.0	No Limit
		EG020-SD: Cobalt	7440-48-4	0.5	mg/kg	0.5	<0.5	0.0	No Limit
		EG020-SD: Arsenic	7440-38-2	1	mg/kg	3.54	2.74	25.8	No Limit
		EG020-SD: Chromium	7440-47-3	1	mg/kg	5.9	5.0	16.6	No Limit
		EG020-SD: Copper	7440-50-8	1	mg/kg	<1.0	<1.0	0.0	No Limit
		EG020-SD: Lead	7439-92-1	1	mg/kg	2.0	1.8	9.2	No Limit
		EG020-SD: Nickel	7440-02-0	1	mg/kg	<1.0	<1.0	0.0	No Limit
		EG020-SD: Zinc	7440-66-6	1	mg/kg	1.1	1.1	0.0	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 6436773)									
EP2503192-016	Split1-Prim	EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	140	140	0.0	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 6436772)									
EP2503192-016	Split1-Prim	EK067G: Total Phosphorus as P	----	2	mg/kg	228	216	5.4	0% - 20%
EP003: Total Organic Carbon (TOC) in Soil (QC Lot: 6441607)									

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 (%)*
EP003: Total Organic Carbon (TOC) in Soil (QC Lot: 6441607) - continued									
EB2508056-001	Anonymous	EP003: Total Organic Carbon	----	0.02	%	35000000 µg/L	3.55	1.5	0% - 20%
ES2506087-002	Anonymous	EP003: Total Organic Carbon	----	0.02	%	1.40	1.35	3.7	0% - 20%
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 6420344)									
EP2503192-001	H-Ws	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP2503192-011	H-Wsb	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QC Lot: 6420343)									

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-SD / EP071-SD: Total Petroleum Hydrocarbons (QC Lot: 6420343) - continued									
EP2503192-001	H-Ws	EP080-SD: C6 - C9 Fraction	----	3	mg/kg	<3	<3	0.0	0% - 3%
EP2503192-011	H-Wsb	EP080-SD: C6 - C9 Fraction	----	3	mg/kg	<3	<3	0.0	0% - 3%
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QC Lot: 6420348)									
EP2503192-001	H-Ws	EP071-SD: C10 - C14 Fraction	----	3	mg/kg	<3	<3	0.0	No Limit
		EP071-SD: C15 - C28 Fraction	----	3	mg/kg	<3	<3	0.0	No Limit
		EP071-SD: C10 - C36 Fraction (sum)	----	3	mg/kg	<3	<3	0.0	No Limit
		EP071-SD: C29 - C36 Fraction	----	5	mg/kg	<5	<5	0.0	No Limit
EP2503192-011	H-Wsb	EP071-SD: C10 - C14 Fraction	----	3	mg/kg	<3	<3	0.0	No Limit
		EP071-SD: C15 - C28 Fraction	----	3	mg/kg	<3	<3	0.0	No Limit
		EP071-SD: C10 - C36 Fraction (sum)	----	3	mg/kg	<3	<3	0.0	No Limit
		EP071-SD: C29 - C36 Fraction	----	5	mg/kg	<5	<5	0.0	No Limit
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QC Lot: 6420343)									
EP2503192-001	H-Ws	EP080-SD: C6 - C10 Fraction	C6_C10	3	mg/kg	<3	<3	0.0	0% - 3%
EP2503192-011	H-Wsb	EP080-SD: C6 - C10 Fraction	C6_C10	3	mg/kg	<3	<3	0.0	0% - 3%
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QC Lot: 6420348)									
EP2503192-001	H-Ws	EP071-SD: >C10 - C16 Fraction	----	3	mg/kg	<3	<3	0.0	No Limit
		EP071-SD: >C16 - C34 Fraction	----	3	mg/kg	<3	<3	0.0	No Limit
		EP071-SD: >C10 - C40 Fraction (sum)	----	3	mg/kg	<3	<3	0.0	No Limit
		EP071-SD: >C34 - C40 Fraction	----	5	mg/kg	<5	<5	0.0	No Limit
EP2503192-011	H-Wsb	EP071-SD: >C10 - C16 Fraction	----	3	mg/kg	<3	<3	0.0	No Limit
		EP071-SD: >C16 - C34 Fraction	----	3	mg/kg	<3	<3	0.0	No Limit
		EP071-SD: >C10 - C40 Fraction (sum)	----	3	mg/kg	<3	<3	0.0	No Limit
		EP071-SD: >C34 - C40 Fraction	----	5	mg/kg	<5	<5	0.0	No Limit
EP080-SD: BTEXN (QC Lot: 6420343)									
EP2503192-001	H-Ws	EP080-SD: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	0% - .2%
		EP080-SD: Toluene	108-88-3	0.2	mg/kg	<0.2	<0.2	0.0	0% - .2%
		EP080-SD: Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	<0.2	0.0	0% - .2%
		EP080-SD: meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	<0.2	0.0	0% - .2%
		EP080-SD: ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	0.0	0% - .2%
		EP080-SD: Total Xylenes	----	0.2 (0.5)*	mg/kg	<0.5	<0.5	0.0	0% - .2%
		EP080-SD: Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	0.0	0% - .2%
		EP080-SD: Naphthalene	91-20-3	0.2	mg/kg	<0.2	<0.2	0.0	0% - .2%
EP2503192-011	H-Wsb	EP080-SD: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	0% - .2%
		EP080-SD: Toluene	108-88-3	0.2	mg/kg	<0.2	<0.2	0.0	0% - .2%
		EP080-SD: Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	<0.2	0.0	0% - .2%

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-SD: BTEXN (QC Lot: 6420343) - continued									
EP2503192-011	H-Wsb	EP080-SD: meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	<0.2	0.0	0% - .2%
		EP080-SD: ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	0.0	0% - .2%
		EP080-SD: Total Xylenes	----	0.2 (0.5)*	mg/kg	<0.5	<0.5	0.0	0% - .2%
		EP080-SD: Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	0.0	0% - .2%
		EP080-SD: Naphthalene	91-20-3	0.2	mg/kg	<0.2	<0.2	0.0	0% - .2%

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG035T: Total Recoverable Mercury by FIMS (Low Level) (QCLot: 6435294)								
EG035T-LL: Mercury	7439-97-6	0.01	mg/kg	<0.01	0.098 mg/kg	92.8	70.0	130
EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 6435295)								
EG020-SD: Antimony	7440-36-0	0.5	mg/kg	<0.50	4.53 mg/kg	93.5	70.0	130
EG020-SD: Arsenic	7440-38-2	1	mg/kg	<1.00	77.39 mg/kg	90.2	70.0	130
EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	<0.1	1.59 mg/kg	99.8	70.0	130
EG020-SD: Chromium	7440-47-3	1	mg/kg	<1.0	18.67 mg/kg	98.2	70.0	130
EG020-SD: Copper	7440-50-8	1	mg/kg	<1.0	46.13 mg/kg	89.0	70.0	130
EG020-SD: Cobalt	7440-48-4	0.5	mg/kg	<0.5	10.47 mg/kg	93.6	70.0	130
EG020-SD: Lead	7439-92-1	1	mg/kg	<1.0	58.42 mg/kg	94.5	70.0	130
EG020-SD: Nickel	7440-02-0	1	mg/kg	<1.0	14.48 mg/kg	97.2	70.0	130
EG020-SD: Silver	7440-22-4	0.1	mg/kg	<0.1	2.82 mg/kg	109	70.0	130
EG020-SD: Zinc	7440-66-6	1	mg/kg	<1.0	190.4 mg/kg	98.8	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 6436773)								
EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	<20	1000 mg/kg	96.5	70.0	110
				<20	100 mg/kg	101	70.0	128
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 6436772)								
EK067G: Total Phosphorus as P	----	2	mg/kg	<2	440 mg/kg	93.6	70.0	110
				<2	44 mg/kg	96.7	73.9	120
EP003: Total Organic Carbon (TOC) in Soil (QCLot: 6441607)								
EP003: Total Organic Carbon	----	0.02	%	<0.02	0.55 %	105	80.0	120
				<0.02	32.3 %	97.2	80.0	120
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 6420344)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	3 mg/kg	96.4	71.0	123
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	3 mg/kg	98.7	69.0	129
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	3 mg/kg	95.2	65.0	125
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	3 mg/kg	97.8	71.0	125
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	3 mg/kg	99.7	66.0	124
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	3 mg/kg	107	60.0	112
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	3 mg/kg	118	67.0	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	3 mg/kg	95.2	65.0	127

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 6420344) - continued								
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	3 mg/kg	86.1	57.0	125
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	3 mg/kg	123	57.0	131
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	3 mg/kg	81.9	65.0	125
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	3 mg/kg	112	69.0	127
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	3 mg/kg	102	63.0	121
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	3 mg/kg	92.7	61.0	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	3 mg/kg	109	52.0	128
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	3 mg/kg	91.6	65.0	125
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QCLot: 6420343)								
EP080-SD: C6 - C9 Fraction	----	3	mg/kg	<3	35 mg/kg	106	70.0	130
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QCLot: 6420348)								
EP071-SD: C10 - C14 Fraction	----	3	mg/kg	<3	504 mg/kg	136	75.9	145
EP071-SD: C15 - C28 Fraction	----	3	mg/kg	<3	1268 mg/kg	102	70.9	140
EP071-SD: C29 - C36 Fraction	----	5	mg/kg	<5	198 mg/kg	105	60.2	132
EP071-SD: C10 - C36 Fraction (sum)	----	3	mg/kg	<3	----	----	----	----
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QCLot: 6420343)								
EP080-SD: C6 - C10 Fraction	C6_C10	3	mg/kg	<3	45 mg/kg	102	70.0	130
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QCLot: 6420348)								
EP071-SD: >C10 - C16 Fraction	----	3	mg/kg	<3	808 mg/kg	120	76.1	147
EP071-SD: >C16 - C34 Fraction	----	3	mg/kg	<3	1134 mg/kg	103	63.4	132
EP071-SD: >C34 - C40 Fraction	----	5	mg/kg	<5	66 mg/kg	91.4	54.9	130
EP071-SD: >C10 - C40 Fraction (sum)	----	3	mg/kg	<3	----	----	----	----
EP080-SD: BTEXN (QCLot: 6420343)								
EP080-SD: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	110	70.0	130
EP080-SD: Toluene	108-88-3	0.2	mg/kg	<0.2	2 mg/kg	97.3	70.0	130
EP080-SD: Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	2 mg/kg	101	70.0	130
EP080-SD: meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	4 mg/kg	97.2	70.0	130
EP080-SD: ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	2 mg/kg	97.5	70.0	130
EP080-SD: Total Xylenes	----	0.2	mg/kg	<0.2	----	----	----	----
EP080-SD: Sum of BTEX	----	0.2	mg/kg	<0.2	----	----	----	----
EP080-SD: Naphthalene	91-20-3	0.2	mg/kg	<0.2	0.5 mg/kg	90.4	70.0	130

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
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 6436773)							
EP2503445-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	500 mg/kg	112	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 6436772)							
EP2503445-002	Anonymous	EK067G: Total Phosphorus as P	----	100 mg/kg	89.4	70.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 6420344)							
EP2503192-002	H-Es	EP075(SIM): Acenaphthene	83-32-9	3 mg/kg	90.1	73.5	125
		EP075(SIM): Pyrene	129-00-0	3 mg/kg	125	70.8	125
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QCLot: 6420343)							
EP2503192-002	H-Es	EP080-SD: C6 - C9 Fraction	----	24 mg/kg	74.0	70.0	130
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons (QCLot: 6420348)							
EP2503192-002	H-Es	EP071-SD: C10 - C14 Fraction	----	504 mg/kg	125	70.0	130
		EP071-SD: C15 - C28 Fraction	----	1268 mg/kg	95.9	70.0	130
		EP071-SD: C29 - C36 Fraction	----	198 mg/kg	100	70.0	130
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QCLot: 6420343)							
EP2503192-002	H-Es	EP080-SD: C6 - C10 Fraction	C6_C10	29 mg/kg	70.2	70.0	130
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons (QCLot: 6420348)							
EP2503192-002	H-Es	EP071-SD: >C10 - C16 Fraction	----	808 mg/kg	111	70.0	130
		EP071-SD: >C16 - C34 Fraction	----	1134 mg/kg	96.4	70.0	130
		EP071-SD: >C34 - C40 Fraction	----	66 mg/kg	88.2	70.0	130
EP080-SD: BTEXN (QCLot: 6420343)							
EP2503192-002	H-Es	EP080-SD: Benzene	71-43-2	2 mg/kg	91.2	70.0	130
		EP080-SD: Toluene	108-88-3	2 mg/kg	86.1	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2503192**	Page	: 1 of 8
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: Charlie Rolfe	Telephone	: +61-8-9406 1301
Project	: 12662246	Date Samples Received	: 04-Mar-2025
Site	: ----	Issue Date	: 18-Mar-2025
Sampler	: Charlie Rolfe	No. of samples received	: 16
Order number	: 12662246	No. of samples analysed	: 16

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, where applicable to the methodology, 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 : Analysis Holding Time Compliance

Matrix: **SOIL**

Method / Container / Client Sample ID(s)		Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved							
H-Ws,	H-Es,	----	----	----	11-Mar-2025	10-Mar-2025	**1**
H-B2s,	H-B3s,						
R-Es,	H-Wsa,						
H-Esa,	H-B2sa,						
H-B3sa,	R-Esa,						
H-Wsb,	H-Esb,						
H-B2sb,	H-B3sb,						
R-Esb,	Split1-Prim						

Outliers : Frequency of Quality Control Samples

Matrix: **SOIL**

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	
Matrix Spikes (MS)						
Total Mercury by FIMS (Low Level)	EG035T-LL	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Total Metals in Sediments by ICPMS	EG020-SD	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 / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)								
Soil Glass Jar - Unpreserved (EA055)								
H-Ws,	H-Es,	**24-Feb-2025**	**----**	----	**----**	**11-Mar-2025**	10-Mar-2025	×
H-B2s,	H-B3s,							
R-Es,	H-Wsa,							
H-Esa,	H-B2sa,							
H-B3sa,	R-Esa,							
H-Wsb,	H-Esb,							
H-B2sb,	H-B3sb,							
R-Esb,	Split1-Prim							

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020-SD: Total Metals in Sediments by ICPMS							
Soil Glass Jar - Unpreserved (EG020-SD)							
Split1-Prim	**24-Feb-2025**	**13-Mar-2025**	23-Aug-2025	✓	**14-Mar-2025**	23-Aug-2025	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T-LL)							
Split1-Prim	**24-Feb-2025**	**13-Mar-2025**	24-Mar-2025	✓	**17-Mar-2025**	24-Mar-2025	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Soil Glass Jar - Unpreserved (EK061G)							
Split1-Prim	**24-Feb-2025**	**14-Mar-2025**	24-Mar-2025	✓	**18-Mar-2025**	11-Apr-2025	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Soil Glass Jar - Unpreserved (EK067G)							
Split1-Prim	**24-Feb-2025**	**14-Mar-2025**	24-Mar-2025	✓	**18-Mar-2025**	11-Apr-2025	✓
EP003: Total Organic Carbon (TOC) in Soil							
Pulp Bag (EP003)							
Split1-Prim	**24-Feb-2025**	**17-Mar-2025**	24-Mar-2025	✓	**17-Mar-2025**	24-Mar-2025	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM))							
H-Ws, H-Es, H-B2s, H-B3s, R-Es, H-Wsa, H-Esa, H-B2sa, H-B3sa, R-Esa, H-Wsb, H-Esb, H-B2sb, H-B3sb, R-Esb, Split1-Prim	**24-Feb-2025**	**10-Mar-2025**	10-Mar-2025	✓	**12-Mar-2025**	19-Apr-2025	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP071-SD)							
H-Ws, H-Es, H-B2s, H-B3s, R-Es, H-Wsa, H-Esa, H-B2sa, H-B3sa, R-Esa, H-Wsb, H-Esb, H-B2sb, H-B3sb, R-Esb, Split1-Prim	**24-Feb-2025**	**10-Mar-2025**	10-Mar-2025	✓	**15-Mar-2025**	19-Apr-2025	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080-SD / EP071-SD: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080-SD)							
H-Ws	**24-Feb-2025**	**06-Mar-2025**	10-Mar-2025	✓	**07-Mar-2025**	10-Mar-2025	✓
Soil Glass Jar - Unpreserved (EP080-SD)							
H-Es, H-B2s, H-B3s, R-Es, H-Wsa, H-Esa, H-B2sa, H-B3sa, R-Esa, H-Wsb, H-Esb, H-B2sb, H-B3sb, R-Esb, Split1-Prim	**24-Feb-2025**	**06-Mar-2025**	10-Mar-2025	✓	**08-Mar-2025**	10-Mar-2025	✓
Soil Glass Jar - Unpreserved (EP071-SD)							
H-Ws, H-Es, H-B2s, H-B3s, R-Es, H-Wsa, H-Esa, H-B2sa, H-B3sa, R-Esa, H-Wsb, H-Esb, H-B2sb, H-B3sb, R-Esb, Split1-Prim	**24-Feb-2025**	**10-Mar-2025**	10-Mar-2025	✓	**15-Mar-2025**	19-Apr-2025	✓
EP080-SD / EP071-SD: Total Recoverable Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080-SD)							
H-Ws	**24-Feb-2025**	**06-Mar-2025**	10-Mar-2025	✓	**07-Mar-2025**	10-Mar-2025	✓
Soil Glass Jar - Unpreserved (EP080-SD)							
H-Es, H-B2s, H-B3s, R-Es, H-Wsa, H-Esa, H-B2sa, H-B3sa, R-Esa, H-Wsb, H-Esb, H-B2sb, H-B3sb, R-Esb, Split1-Prim	**24-Feb-2025**	**06-Mar-2025**	10-Mar-2025	✓	**08-Mar-2025**	10-Mar-2025	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080-SD: BTEXN							
Soil Glass Jar - Unpreserved (EP080-SD)							
H-Ws	**24-Feb-2025**	**06-Mar-2025**	10-Mar-2025	✓	**07-Mar-2025**	10-Mar-2025	✓
Soil Glass Jar - Unpreserved (EP080-SD)							
H-Es, H-B2s, H-B3s, R-Es, H-Wsa, H-Esa, H-B2sa, H-B3sa, R-Esa, H-Wsb, H-Esb, H-B2sb, H-B3sb, R-Esb, Split1-Prim	**24-Feb-2025**	**06-Mar-2025**	10-Mar-2025	✓	**08-Mar-2025**	10-Mar-2025	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TKN as N By Discrete Analyser	EK061G	1	9	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS (Low Level)	EG035T-LL	1	1	**100.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals in Sediments by ICPMS	EG020-SD	1	1	**100.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP003	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus By Discrete Analyser	EK067G	1	9	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TPH - Semivolatile Fraction	EP071-SD	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX in Sediments	EP080-SD	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TKN as N By Discrete Analyser	EK061G	2	9	**22.22**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS (Low Level)	EG035T-LL	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals in Sediments by ICPMS	EG020-SD	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP003	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus By Discrete Analyser	EK067G	2	9	**22.22**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TPH - Semivolatile Fraction	EP071-SD	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX in Sediments	EP080-SD	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TKN as N By Discrete Analyser	EK061G	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS (Low Level)	EG035T-LL	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals in Sediments by ICPMS	EG020-SD	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP003	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus By Discrete Analyser	EK067G	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TPH - Semivolatile Fraction	EP071-SD	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX in Sediments	EP080-SD	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TKN as N By Discrete Analyser	EK061G	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS (Low Level)	EG035T-LL	0	1	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Total Metals in Sediments by ICPMS	EG020-SD	0	1	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus By Discrete Analyser	EK067G	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TPH - Semivolatile Fraction	EP071-SD	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX in Sediments	EP080-SD	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Total Metals in Sediments by ICPMS	EG020-SD	SOIL	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. Analyte list and LORs per NODG.
Total Mercury by FIMS (Low Level)	EG035T-LL	SOIL	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3)
TKN as N By Discrete Analyser	EK061G	SOIL	In house: Referenced to APHA 4500-Norg-D Soil samples are digested using Kjeldahl digestion followed by determination by Discrete Analyser.
Total Phosphorus By Discrete Analyser	EK067G	SOIL	In house: Referenced to APHA 4500 P-B&F This procedure involves sulfuric acid digestion and quantification using Discrete Analyser.
Total Organic Carbon	EP003	SOIL	In house C-IR17. Dried and pulverised sample is reacted with acid to remove inorganic Carbonates, then combusted in a furnace in the presence of strong oxidants / catalysts. The evolved (Organic) Carbon (as CO2) is automatically measured by infra-red detector.
TPH - Semivolatile Fraction	EP071-SD	SOIL	In house: Referenced to USEPA SW 846 - 8270. Extracts are analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX in Sediments	EP080-SD	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.

Preparation Methods	Method	Matrix	Method Descriptions
TKN/TP Digestion	EK061/EK067	SOIL	In house: Referenced to APHA 4500 Norg- D; APHA 4500 P - H. Macro Kjeldahl digestion.
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).
Dry and Pulverise (up to 100g)	GEO30	SOIL	#
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.

Preparation Methods	Method	Matrix	Method Descriptions
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 (Option A - Concentrating)	ORG17A	SOIL	In house: Mechanical agitation (tumbler). 20g of sample, Na2SO4 and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

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Certificate of Analysis PGC0367

Client Details

Client	ALS (Perth)
Contact	Subresults Perth
Address	10 Hod Way, MALAGA, WA, 6090

Sample Details

Your Reference	EP2503192
Number of Samples	16 Soil
Date Samples Received	06/03/2025
Date Instructions Received	06/03/2025

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for soils and on an as received basis for other matrices.

Report Details

Date Results Requested by	17/03/2025
Date of Issue	12/03/2025

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

Authorisation Details

Results Approved By	Travis Carey, Organics Supervisor
Laboratory Manager	Michael Kubiak

Certificate of Analysis PGC0367

Samples in this Report

Envirolab ID	Sample ID	Description	Matrix	Date Sampled	Date Received
PGC0367-01	H-Ws	EP2503192_001	Soil	24/02/2025	06/03/2025
PGC0367-02	H-Es	EP2503192_002	Soil	24/02/2025	06/03/2025
PGC0367-03	H-B2s	EP2503192_003	Soil	24/02/2025	06/03/2025
PGC0367-04	H-B3s	EP2503192_004	Soil	24/02/2025	06/03/2025
PGC0367-05	R-Es	EP2503192_005	Soil	24/02/2025	06/03/2025
PGC0367-06	H-Wsa	EP2503192_006	Soil	24/02/2025	06/03/2025
PGC0367-07	H-Esa	EP2503192_007	Soil	24/02/2025	06/03/2025
PGC0367-08	H-B2sa	EP2503192_008	Soil	24/02/2025	06/03/2025
PGC0367-09	H-B3sa	EP2503192_009	Soil	24/02/2025	06/03/2025
PGC0367-10	R-Esa	EP2503192_010	Soil	24/02/2025	06/03/2025
PGC0367-11	H-Wsb	EP2503192_011	Soil	24/02/2025	06/03/2025
PGC0367-12	H-Esb	EP2503192_012	Soil	24/02/2025	06/03/2025
PGC0367-13	H-B2sb	EP2503192_013	Soil	24/02/2025	06/03/2025
PGC0367-14	H-B3sb	EP2503192_014	Soil	24/02/2025	06/03/2025
PGC0367-15	R-Esb	EP2503192_015	Soil	24/02/2025	06/03/2025
PGC0367-16	Split1-Prim	EP2503192_016	Soil	24/02/2025	06/03/2025

Certificate of Analysis PGC0367

Organometallics (Soil)

Envirolab ID	Units	PQL	PGC0367-01	PGC0367-02	PGC0367-03	PGC0367-04	PGC0367-05
Your Reference			H-Ws EP2503192_001	H-Es EP2503192_002	H-B2s EP2503192_003	H-B3s EP2503192_004	R-Es EP2503192_005
Date Sampled			24/02/2025	24/02/2025	24/02/2025	24/02/2025	24/02/2025
Tributyltin as Sn	µg/kg	0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Surrogate Triphenyltin	%		*84.6*	*95.5*	*98.6*	*91.8*	*92.9*

Envirolab ID	Units	PQL	PGC0367-06	PGC0367-07	PGC0367-08	PGC0367-09	PGC0367-10
Your Reference			H-Wsa EP2503192_006	H-Esa EP2503192_007	H-B2sa EP2503192_008	H-B3sa EP2503192_009	R-Esa EP2503192_010
Date Sampled			24/02/2025	24/02/2025	24/02/2025	24/02/2025	24/02/2025
Tributyltin as Sn	µg/kg	0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Surrogate Triphenyltin	%		*92.2*	*97.0*	*111*	*99.3*	*95.5*

Envirolab ID	Units	PQL	PGC0367-11	PGC0367-12	PGC0367-13	PGC0367-14	PGC0367-15
Your Reference			H-Wsb EP2503192_011	H-Esb EP2503192_012	H-B2sb EP2503192_013	H-B3sb EP2503192_014	R-Esb EP2503192_015
Date Sampled			24/02/2025	24/02/2025	24/02/2025	24/02/2025	24/02/2025
Tributyltin as Sn	µg/kg	0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Surrogate Triphenyltin	%		*97.5*	*104*	*115*	*104*	*96.5*

Envirolab ID	Units	PQL	PGC0367-16
Your Reference			Split1-Prim EP2503192_016
Date Sampled			24/02/2025
Tributyltin as Sn	µg/kg	0.50	<0.50
Surrogate Triphenyltin	%		*120*

Method Summary

Method ID	Methodology Summary
ORG-025_TBT_S	Determination of Organometallic Compounds by derivatisation and analysis by GC-MS-MS.

Result Definitions

Identifier	Description
NR	Not reported
NEPM	National Environment Protection Measure
NS	Not specified
LCS	Laboratory Control Sample
RPD	Relative Percent Difference
>	Greater than
<	Less than
PQL	Practical Quantitation Limit
INS	Insufficient sample for this test
NA	Test not required
NT	Not tested
DOL	Samples rejected due to particulate overload (air filters only)
RFD	Samples rejected due to filter damage (air filters only)
RUD	Samples rejected due to uneven deposition (air filters only)
##	Indicates a laboratory acceptance criteria outlier, for further details, see Result Comments and/or QC Comments

Quality Control Definitions

Blank

This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, and is determined by processing solvents and reagents in exactly the same manner as for samples.

Surrogate Spike

Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

LCS (Laboratory Control Sample)

This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Matrix Spike

A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

Duplicate

This is the complete duplicate analysis of a sample from the process batch. The sample selected should be one where the analyte concentration is easily measurable.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria. Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction. Spikes for Physical and Aggregate Tests are not applicable. For VOCs in water samples, three vials are required for duplicate or spike analysis.

General Acceptance Criteria (GAC) - Analyte specific criteria applies for some analytes and is reflected in QC recovery tables.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% - see ELN-P05 QAQC tables for details (available on request); <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase. Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

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

Miscellaneous Information

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

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached. We have taken the sampling date as being the date received at the laboratory.

Two significant figures are reported for the majority of tests and with a high degree of confidence, for results <10*PQL, the second significant figure may be in doubt i.e. has a relatively high degree of uncertainty and is provided for information only.

Measurement Uncertainty estimates are available for most tests upon request.

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

Urine Analysis - The BEI values listed are taken from the 2022 edition of *TLVs and BEIs Threshold Limits by ACGIH*.

Air volume measurements are not covered by Envirolab's NATA accreditation.

Data Quality Assessment Summary PGC0367

Client Details

Client	ALS (Perth)
Your Reference	EP2503192
Date Issued	12/03/2025

Recommended Holding Time Compliance

No recommended holding time exceedances

Quality Control and QC Frequency

QC Type	Compliant	Details
Blank	Yes	No Outliers
LCS	Yes	No Outliers
Duplicates	Yes	No Outliers
Matrix Spike	Yes	No Outliers
Surrogates / Extracted Internal Standards	Yes	No Outliers
QC Frequency	Yes	No Outliers

Surrogates/Extracted Internal Standards, Duplicates and/or Matrix Spikes are not always relevant/applicable to certain analyses and matrices. Therefore, said QC measures are deemed compliant in these situations by default. See Laboratory Acceptance Criteria for more information

Data Quality Assessment Summary PGC0367

Recommended Holding Time Compliance

Analysis	Sample Number(s)	Date Sampled	Date Extracted	Date Analysed	Compliant
TBT | Soil	1-11	24/02/2025	10/03/2025	11/03/2025	Yes
	12-16	24/02/2025	10/03/2025	12/03/2025	Yes

Quality Control PGC0367

ORG-025_TBT_S|Organometallics (Soil) | Batch BGC1213

Analyte	Units	PQL	Blank	DUP1 PGC0367-01 Samp | QC | RPD %	DUP2 PGC0367-09 Samp | QC | RPD %	LCS %	Spike % PGC0367-02
Tributyltin	µg/kg	0.5		<0.50 | <0.50 | [NA]	<0.50 | <0.50 | [NA]	100	103
Tributyltin as Sn	µg/kg	0.50	<0.50	<0.50 | <0.50 | [NA]	<0.50 | <0.50 | [NA]	[NA]	[NA]
Surrogate Triphenyltin	*%*		*81.4*	*84.6 | 84.3*	*99.3 | 104*	*87.2*	*94.1*

Appendix E

Secondary laboratory (Eurofins) documentation (CoC, CoA, QCR) for PAH, TRH, TPH, BTEX and TBT in sediments

Appendix F

MAFRL particle size analysis reports for sediments

Marine and Freshwater Research Laboratory
Tel: 08 93602907 Address: 90 South St, Murdoch, WA, 6150

Accreditation Number: 10603
Accredited for compliance with ISO/IEC 17025 - Testing.

Murdoch University

PARTICLE SIZE ANALYSIS REPORT

Contact: Jose Romero
Customer: GHD
Address: Level 10, 999 Hay Street, Perth WA 6000

Date of Issue: 14/03/2025
Date Received: 27/02/2025
Our Reference: GHD25-2

Sample Name:	H-B2s
Sampling Date:	24/02/2025
Sample Type:	Sediment
MAFRL Job Code:	GHD25-2
Client Reference:	12662246
Analysis Date:	7/03/2025
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**1.90**
Very Fine Silt % (4-8µm)	1.23
Fine Silt % (8-16µm)	1.80
Medium Silt % (16-31µm)	2.82
Course Silt % (31-63µm)	9.14
Total Silt (4-63µm)	**14.99**
Very Fine sand % (63-125µm)	14.86
Fine sand % (125-250µm)	14.14
Medium sand % (250-500µm)	11.70
Coarse sand % (500-1000µm)	22.80
Very Coarse sand % (1000-2000µm)	15.78
Total Sand (63-2000µm)	**79.29**
Total Gravels (>2000µm)	**3.82**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	22.80
1000	15.78
2000	3.60
4000	0.22
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	308.61
Minimum settling velocity of 50% of particles (mm s^1)	78.54
Time for 50% of particles to settle over 1 m (hours)	0.004
D10 (µm)	40.11
Minimum settling velocity of 90% of particles (mm s^1)	1.33
Time for 90% of particles to settle over 1 m (hours)	0.209

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Polyphosphate
Sonication (s)	300

Sample visual assessment
Sand with some mud, rock and shell present.

Signatory: Jamie Woodward
Date: 14/03/2025

The results only apply to the sample as received and to the sample tested.
Spare test items will be held for two months unless otherwise requested.

Marine and Freshwater Research Laboratory
Tel: 08 93602907 Address: 90 South St, Murdoch, WA, 6150

Accreditation Number: 10603
Accredited for compliance with ISO/IEC 17025 - Testing.

Murdoch University

PARTICLE SIZE ANALYSIS REPORT

Contact: Jose Romero
Customer: GHD
Address: Level 10, 999 Hay Street, Perth WA 6000

Date of Issue: 14/03/2025
Date Received: 27/02/2025
Our Reference: GHD25-2

Sample Name:	H-B2sa
Sampling Date:	24/02/2025
Sample Type:	Sediment
MAFRL Job Code:	GHD25-2
Client Reference:	12662246
Analysis Date:	10/03/2025
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**0.66**
Very Fine Silt % (4-8µm)	0.58
Fine Silt % (8-16µm)	0.87
Medium Silt % (16-31µm)	1.08
Course Silt % (31-63µm)	2.36
Total Silt (4-63µm)	**4.88**
Very Fine sand % (63-125µm)	6.51
Fine sand % (125-250µm)	19.27
Medium sand % (250-500µm)	22.60
Coarse sand % (500-1000µm)	28.09
Very Coarse sand % (1000-2000µm)	14.24
Total Sand (63-2000µm)	**90.72**
Total Gravels (>2000µm)	**3.73**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	28.09
1000	14.24
2000	2.80
4000	0.93
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	426.35
Minimum settling velocity of 50% of particles (mm s^1)	149.89
Time for 50% of particles to settle over 1 m (hours)	0.002
D10 (µm)	108.50
Minimum settling velocity of 90% of particles (mm s^1)	9.71
Time for 90% of particles to settle over 1 m (hours)	0.029

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Polyphosphate
Sonication (s)	300

Sample visual assessment
Sand with mud, rock and shell present.

Signatory: Jamie Woodward
Date: 14/03/2025

The results only apply to the sample as received and to the sample tested.
Spare test items will be held for two months unless otherwise requested.

Marine and Freshwater Research Laboratory
Tel: 08 93602907 Address: 90 South St, Murdoch, WA, 6150

Accreditation Number: 10603
Accredited for compliance with ISO/IEC 17025 - Testing.

Murdoch University

PARTICLE SIZE ANALYSIS REPORT

Contact: Jose Romero
Customer: GHD
Address: Level 10, 999 Hay Street, Perth WA 6000

Date of Issue: 14/03/2025
Date Received: 27/02/2025
Our Reference: GHD25-2

Sample Name:	H-B2sb
Sampling Date:	24/02/2025
Sample Type:	Sediment
MAFRL Job Code:	GHD25-2
Client Reference:	12662246
Analysis Date:	10/03/2025
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**0.85**
Very Fine Silt % (4-8µm)	0.66
Fine Silt % (8-16µm)	1.04
Medium Silt % (16-31µm)	1.34
Course Silt % (31-63µm)	3.28
Total Silt (4-63µm)	**6.33**
Very Fine sand % (63-125µm)	11.05
Fine sand % (125-250µm)	21.50
Medium sand % (250-500µm)	18.66
Coarse sand % (500-1000µm)	27.88
Very Coarse sand % (1000-2000µm)	12.18
Total Sand (63-2000µm)	**91.27**
Total Gravels (>2000µm)	**1.56**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	27.88
1000	12.18
2000	1.42
4000	0.14
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	345.51
Minimum settling velocity of 50% of particles (mm s^1)	98.44
Time for 50% of particles to settle over 1 m (hours)	0.003
D10 (µm)	81.16
Minimum settling velocity of 90% of particles (mm s^1)	5.43
Time for 90% of particles to settle over 1 m (hours)	0.051

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Polyphosphate
Sonication (s)	300

Sample visual assessment
Sand with mud, rock and shell present.

Signatory: Jamie Woodward
Date: 14/03/2025

The results only apply to the sample as received and to the sample tested.
Spare test items will be held for two months unless otherwise requested.

Marine and Freshwater Research Laboratory
Tel: 08 93602907 Address: 90 South St, Murdoch, WA, 6150

Accreditation Number: 10603
Accredited for compliance with ISO/IEC 17025 - Testing.

Murdoch University

PARTICLE SIZE ANALYSIS REPORT

Contact: Jose Romero
Customer: GHD
Address: Level 10, 999 Hay Street, Perth WA 6000

Date of Issue: 14/03/2025
Date Received: 27/02/2025
Our Reference: GHD25-2

Sample Name:	H-B3s
Sampling Date:	24/02/2025
Sample Type:	Sediment
MAFRL Job Code:	GHD25-2
Client Reference:	12662246
Analysis Date:	7/03/2025
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**2.56**
Very Fine Silt % (4-8µm)	1.42
Fine Silt % (8-16µm)	2.47
Medium Silt % (16-31µm)	5.32
Course Silt % (31-63µm)	20.54
Total Silt (4-63µm)	**29.73**
Very Fine sand % (63-125µm)	40.57
Fine sand % (125-250µm)	24.35
Medium sand % (250-500µm)	2.42
Coarse sand % (500-1000µm)	0.21
Very Coarse sand % (1000-2000µm)	0.13
Total Sand (63-2000µm)	**67.68**
Total Gravels (>2000µm)	**0.03**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	0.21
1000	0.13
2000	0.03
4000	0.00
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	86.55
Minimum settling velocity of 50% of particles (mm s^1)	6.18
Time for 50% of particles to settle over 1 m (hours)	0.045
D10 (µm)	26.57
Minimum settling velocity of 90% of particles (mm s^1)	0.58
Time for 90% of particles to settle over 1 m (hours)	0.477

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Polyphosphate
Sonication (s)	300

Sample visual assessment
Sand with mud and some shell present.

Signatory: Jamie Woodward
Date: 14/03/2025

The results only apply to the sample as received and to the sample tested.
Spare test items will be held for two months unless otherwise requested.

Marine and Freshwater Research Laboratory
Tel: 08 93602907 Address: 90 South St, Murdoch, WA, 6150

Accreditation Number: 10603
Accredited for compliance with ISO/IEC 17025 - Testing.

Murdoch University

PARTICLE SIZE ANALYSIS REPORT

Contact: Jose Romero
Customer: GHD
Address: Level 10, 999 Hay Street, Perth WA 6000

Date of Issue: 14/03/2025
Date Received: 27/02/2025
Our Reference: GHD25-2

Sample Name:	H-B3sa
Sampling Date:	24/02/2025
Sample Type:	Sediment
MAFRL Job Code:	GHD25-2
Client Reference:	12662246
Analysis Date:	10/03/2025
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**2.87**
Very Fine Silt % (4-8µm)	1.59
Fine Silt % (8-16µm)	2.64
Medium Silt % (16-31µm)	5.58
Course Silt % (31-63µm)	20.97
Total Silt (4-63µm)	**30.78**
Very Fine sand % (63-125µm)	39.90
Fine sand % (125-250µm)	23.33
Medium sand % (250-500µm)	2.30
Coarse sand % (500-1000µm)	0.49
Very Coarse sand % (1000-2000µm)	0.12
Total Sand (63-2000µm)	**66.14**
Total Gravels (>2000µm)	**0.21**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	0.49
1000	0.12
2000	0.21
4000	0.00
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	84.80
Minimum settling velocity of 50% of particles (mm s^1)	5.93
Time for 50% of particles to settle over 1 m (hours)	0.047
D10 (µm)	24.41
Minimum settling velocity of 90% of particles (mm s^1)	0.49
Time for 90% of particles to settle over 1 m (hours)	0.565

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Polyphosphate
Sonication (s)	300

Sample visual assessment
Mud with sand and some shell present.

Signatory: Jamie Woodward
Date: 14/03/2025

The results only apply to the sample as received and to the sample tested.
Spare test items will be held for two months unless otherwise requested.

Marine and Freshwater Research Laboratory
Tel: 08 93602907 Address: 90 South St, Murdoch, WA, 6150

Accreditation Number: 10603
Accredited for compliance with ISO/IEC 17025 - Testing.

Murdoch University

PARTICLE SIZE ANALYSIS REPORT

Contact: Jose Romero
Customer: GHD
Address: Level 10, 999 Hay Street, Perth WA 6000

Date of Issue: 14/03/2025
Date Received: 27/02/2025
Our Reference: GHD25-2

Sample Name:	H-B3sb
Sampling Date:	24/02/2025
Sample Type:	Sediment
MAFRL Job Code:	GHD25-2
Client Reference:	12662246
Analysis Date:	11/03/2025
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**2.47**
Very Fine Silt % (4-8µm)	1.32
Fine Silt % (8-16µm)	2.29
Medium Silt % (16-31µm)	4.84
Course Silt % (31-63µm)	19.62
Total Silt (4-63µm)	**28.07**
Very Fine sand % (63-125µm)	40.68
Fine sand % (125-250µm)	25.46
Medium sand % (250-500µm)	2.95
Coarse sand % (500-1000µm)	0.27
Very Coarse sand % (1000-2000µm)	0.07
Total Sand (63-2000µm)	**69.43**
Total Gravels (>2000µm)	**0.04**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	0.27
1000	0.07
2000	0.04
4000	0.00
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	89.17
Minimum settling velocity of 50% of particles (mm s^1)	6.56
Time for 50% of particles to settle over 1 m (hours)	0.042
D10 (µm)	28.51
Minimum settling velocity of 90% of particles (mm s^1)	0.67
Time for 90% of particles to settle over 1 m (hours)	0.414

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Polyphosphate
Sonication (s)	300

Sample visual assessment
Sand with mud and some shell present.

Signatory: Jamie Woodward
Date: 14/03/2025

The results only apply to the sample as received and to the sample tested.
Spare test items will be held for two months unless otherwise requested.

Marine and Freshwater Research Laboratory
Tel: 08 93602907 Address: 90 South St, Murdoch, WA, 6150

Accreditation Number: 10603
Accredited for compliance with ISO/IEC 17025 - Testing.

Murdoch University

PARTICLE SIZE ANALYSIS REPORT

Contact: Jose Romero
Customer: GHD
Address: Level 10, 999 Hay Street, Perth WA 6000

Date of Issue: 14/03/2025
Date Received: 27/02/2025
Our Reference: GHD25-2

Sample Name:	H-Es
Sampling Date:	24/02/2025
Sample Type:	Sediment
MAFRL Job Code:	GHD25-2
Client Reference:	12662246
Analysis Date:	7/03/2025
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**4.97**
Very Fine Silt % (4-8µm)	3.51
Fine Silt % (8-16µm)	5.00
Medium Silt % (16-31µm)	6.89
Course Silt % (31-63µm)	10.55
Total Silt (4-63µm)	**25.95**
Very Fine sand % (63-125µm)	13.77
Fine sand % (125-250µm)	17.94
Medium sand % (250-500µm)	16.29
Coarse sand % (500-1000µm)	13.17
Very Coarse sand % (1000-2000µm)	4.08
Total Sand (63-2000µm)	**65.26**
Total Gravels (>2000µm)	**3.82**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	13.17
1000	4.08
2000	2.27
4000	0.86
8000	0.70
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	156.23
Minimum settling velocity of 50% of particles (mm s^1)	20.13
Time for 50% of particles to settle over 1 m (hours)	0.014
D10 (µm)	10.17
Minimum settling velocity of 90% of particles (mm s^1)	0.09
Time for 90% of particles to settle over 1 m (hours)	3.256

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Polyphosphate
Sonication (s)	300

Sample visual assessment
Sand with mud and some rock and shell present.

Signatory: Jamie Woodward
Date: 14/03/2025

The results only apply to the sample as received and to the sample tested.
Spare test items will be held for two months unless otherwise requested.

Marine and Freshwater Research Laboratory
Tel: 08 93602907 Address: 90 South St, Murdoch, WA, 6150

Accreditation Number: 10603
Accredited for compliance with ISO/IEC 17025 - Testing.

Murdoch University

PARTICLE SIZE ANALYSIS REPORT

Contact: Jose Romero
Customer: GHD
Address: Level 10, 999 Hay Street, Perth WA 6000

Date of Issue: 14/03/2025
Date Received: 27/02/2025
Our Reference: GHD25-2

Sample Name:	H-Esa
Sampling Date:	24/02/2025
Sample Type:	Sediment
MAFRL Job Code:	GHD25-2
Client Reference:	12662246
Analysis Date:	10/03/2025
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**7.93**
Very Fine Silt % (4-8µm)	5.12
Fine Silt % (8-16µm)	6.98
Medium Silt % (16-31µm)	9.70
Course Silt % (31-63µm)	14.17
Total Silt (4-63µm)	**35.97**
Very Fine sand % (63-125µm)	15.57
Fine sand % (125-250µm)	17.81
Medium sand % (250-500µm)	14.46
Coarse sand % (500-1000µm)	5.42
Very Coarse sand % (1000-2000µm)	1.77
Total Sand (63-2000µm)	**55.03**
Total Gravels (>2000µm)	**1.07**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	5.42
1000	1.77
2000	1.07
4000	0.00
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	82.99
Minimum settling velocity of 50% of particles (mm s^1)	5.68
Time for 50% of particles to settle over 1 m (hours)	0.049
D10 (µm)	5.42
Minimum settling velocity of 90% of particles (mm s^1)	0.02
Time for 90% of particles to settle over 1 m (hours)	11.476

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Polyphosphate
Sonication (s)	300

Sample visual assessment
Mud with sand, rock and shell present.

Signatory: Jamie Woodward
Date: 14/03/2025

The results only apply to the sample as received and to the sample tested.
Spare test items will be held for two months unless otherwise requested.

Marine and Freshwater Research Laboratory
Tel: 08 93602907 Address: 90 South St, Murdoch, WA, 6150

Accreditation Number: 10603
Accredited for compliance with ISO/IEC 17025 - Testing.

Murdoch University

PARTICLE SIZE ANALYSIS REPORT

Contact: Jose Romero
Customer: GHD
Address: Level 10, 999 Hay Street, Perth WA 6000

Date of Issue: 14/03/2025
Date Received: 27/02/2025
Our Reference: GHD25-2

Sample Name:	H-Esb
Sampling Date:	27/02/2025
Sample Type:	Sediment
MAFRL Job Code:	GHD25-2
Client Reference:	12662246
Analysis Date:	11/03/2025
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**3.03**
Very Fine Silt % (4-8µm)	2.36
Fine Silt % (8-16µm)	3.49
Medium Silt % (16-31µm)	4.40
Course Silt % (31-63µm)	6.91
Total Silt (4-63µm)	**17.17**
Very Fine sand % (63-125µm)	13.50
Fine sand % (125-250µm)	20.55
Medium sand % (250-500µm)	19.44
Coarse sand % (500-1000µm)	16.31
Very Coarse sand % (1000-2000µm)	7.24
Total Sand (63-2000µm)	**77.04**
Total Gravels (>2000µm)	**2.76**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	16.31
1000	7.24
2000	2.51
4000	0.25
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	219.27
Minimum settling velocity of 50% of particles (mm s^1)	39.65
Time for 50% of particles to settle over 1 m (hours)	0.007
D10 (µm)	19.18
Minimum settling velocity of 90% of particles (mm s^1)	0.30
Time for 90% of particles to settle over 1 m (hours)	0.916

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Polyphosphate
Sonication (s)	300

Sample visual assessment
Sand with mud, rock and shell present.

Signatory: Jamie Woodward
Date: 14/03/2025

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PARTICLE SIZE ANALYSIS REPORT

Contact: Jose Romero
Customer: GHD
Address: Level 10, 999 Hay Street, Perth WA 6000

Date of Issue: 14/03/2025
Date Received: 27/02/2025
Our Reference: GHD25-2

Sample Name:	H-WS
Sampling Date:	24/02/2025
Sample Type:	Sediment
MAFRL Job Code:	GHD25-2
Client Reference:	12662246
Analysis Date:	7/03/2025
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**17.72**
Very Fine Silt % (4-8µm)	10.54
Fine Silt % (8-16µm)	12.76
Medium Silt % (16-31µm)	17.37
Course Silt % (31-63µm)	23.40
Total Silt (4-63µm)	**64.06**
Very Fine sand % (63-125µm)	14.30
Fine sand % (125-250µm)	2.93
Medium sand % (250-500µm)	0.93
Coarse sand % (500-1000µm)	0.05
Very Coarse sand % (1000-2000µm)	0.01
Total Sand (63-2000µm)	**18.22**
Total Gravels (>2000µm)	**0.00**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	0.05
1000	0.01
2000	0.00
4000	0.00
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	23.25
Minimum settling velocity of 50% of particles (mm s^1)	0.45
Time for 50% of particles to settle over 1 m (hours)	0.623
D10 (µm)	2.18
Minimum settling velocity of 90% of particles (mm s^1)	0.00
Time for 90% of particles to settle over 1 m (hours)	70.732

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Polyphosphate
Sonication (s)	300

Sample visual assessment
Mud with no other noticeable sediment types present.

Signatory: Jamie Woodward
Date: 14/03/2025

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PARTICLE SIZE ANALYSIS REPORT

Contact: Jose Romero
Customer: GHD
Address: Level 10, 999 Hay Street, Perth WA 6000

Date of Issue: 14/03/2025
Date Received: 27/02/2025
Our Reference: GHD25-2

Sample Name:	H-Wsa
Sampling Date:	24/02/2025
Sample Type:	Sediment
MAFRL Job Code:	GHD25-2
Client Reference:	12662246
Analysis Date:	7/03/2025
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**16.09**
Very Fine Silt % (4-8µm)	10.02
Fine Silt % (8-16µm)	12.69
Medium Silt % (16-31µm)	18.22
Course Silt % (31-63µm)	25.12
Total Silt (4-63µm)	**66.05**
Very Fine sand % (63-125µm)	14.78
Fine sand % (125-250µm)	2.65
Medium sand % (250-500µm)	0.34
Coarse sand % (500-1000µm)	0.08
Very Coarse sand % (1000-2000µm)	0.00
Total Sand (63-2000µm)	**17.85**
Total Gravels (>2000µm)	**0.00**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	0.08
1000	0.00
2000	0.00
4000	0.00
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	24.80
Minimum settling velocity of 50% of particles (mm s^1)	0.51
Time for 50% of particles to settle over 1 m (hours)	0.548
D10 (µm)	2.40
Minimum settling velocity of 90% of particles (mm s^1)	0.00
Time for 90% of particles to settle over 1 m (hours)	58.397

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Polyphosphate
Sonication (s)	300

Sample visual assessment
Mud with no other noticeable sediment types present.

Signatory: Jamie Woodward
Date: 14/03/2025

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Marine and Freshwater Research Laboratory
Tel: 08 93602907 Address: 90 South St, Murdoch, WA, 6150

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Murdoch University

PARTICLE SIZE ANALYSIS REPORT

Contact: Jose Romero
Customer: GHD
Address: Level 10, 999 Hay Street, Perth WA 6000

Date of Issue: 14/03/2025
Date Received: 27/02/2025
Our Reference: GHD25-2

Sample Name:	H-Wsb
Sampling Date:	24/02/2025
Sample Type:	Sediment
MAFRL Job Code:	GHD25-2
Client Reference:	12662246
Analysis Date:	10/03/2025
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**16.70**
Very Fine Silt % (4-8µm)	10.03
Fine Silt % (8-16µm)	12.45
Medium Silt % (16-31µm)	17.65
Course Silt % (31-63µm)	24.54
Total Silt (4-63µm)	**64.67**
Very Fine sand % (63-125µm)	15.10
Fine sand % (125-250µm)	2.71
Medium sand % (250-500µm)	0.80
Coarse sand % (500-1000µm)	0.02
Very Coarse sand % (1000-2000µm)	0.00
Total Sand (63-2000µm)	**18.63**
Total Gravels (>2000µm)	**0.00**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	0.02
1000	0.00
2000	0.00
4000	0.00
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	24.77
Minimum settling velocity of 50% of particles (mm s^1)	0.51
Time for 50% of particles to settle over 1 m (hours)	0.549
D10 (µm)	2.29
Minimum settling velocity of 90% of particles (mm s^1)	0.00
Time for 90% of particles to settle over 1 m (hours)	64.065

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Polyphosphate
Sonication (s)	300

Sample visual assessment
Mud with no other noticeable sediment types present.

Signatory: Jamie Woodward
Date: 14/03/2025

The results only apply to the sample as received and to the sample tested.
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PARTICLE SIZE ANALYSIS REPORT

Contact: Jose Romero
Customer: GHD
Address: Level 10, 999 Hay Street, Perth WA 6000

Date of Issue: 14/03/2025
Date Received: 27/02/2025
Our Reference: GHD25-2

Sample Name:	R-Es
Sampling Date:	24/02/2025
Sample Type:	Sediment
MAFRL Job Code:	GHD25-2
Client Reference:	12662246
Analysis Date:	7/03/2025
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**17.26**
Very Fine Silt % (4-8µm)	10.15
Fine Silt % (8-16µm)	12.23
Medium Silt % (16-31µm)	16.85
Course Silt % (31-63µm)	22.55
Total Silt (4-63µm)	**61.79**
Very Fine sand % (63-125µm)	15.12
Fine sand % (125-250µm)	4.48
Medium sand % (250-500µm)	0.90
Coarse sand % (500-1000µm)	0.26
Very Coarse sand % (1000-2000µm)	0.19
Total Sand (63-2000µm)	**20.96**
Total Gravels (>2000µm)	**0.00**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	0.26
1000	0.19
2000	0.00
4000	0.00
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	24.71
Minimum settling velocity of 50% of particles (mm s^1)	0.50
Time for 50% of particles to settle over 1 m (hours)	0.552
D10 (µm)	2.24
Minimum settling velocity of 90% of particles (mm s^1)	0.00
Time for 90% of particles to settle over 1 m (hours)	67.340

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Polyphosphate
Sonication (s)	300

Sample visual assessment
Mud with no other noticeable sediment types present.

Signatory: Jamie Woodward
Date: 14/03/2025

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Marine and Freshwater Research Laboratory
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PARTICLE SIZE ANALYSIS REPORT

Contact: Jose Romero
Customer: GHD
Address: Level 10, 999 Hay Street, Perth WA 6000

Date of Issue: 14/03/2025
Date Received: 27/02/2025
Our Reference: GHD25-2

Sample Name:	R-Esa
Sampling Date:	24/02/2025
Sample Type:	Sediment
MAFRL Job Code:	GHD25-2
Client Reference:	12662246
Analysis Date:	10/03/2025
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**13.88**
Very Fine Silt % (4-8µm)	8.10
Fine Silt % (8-16µm)	9.89
Medium Silt % (16-31µm)	13.56
Course Silt % (31-63µm)	19.09
Total Silt (4-63µm)	**50.64**
Very Fine sand % (63-125µm)	14.82
Fine sand % (125-250µm)	6.89
Medium sand % (250-500µm)	5.52
Coarse sand % (500-1000µm)	4.51
Very Coarse sand % (1000-2000µm)	2.35
Total Sand (63-2000µm)	**34.09**
Total Gravels (>2000µm)	**1.39**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	4.51
1000	2.35
2000	1.39
4000	0.00
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	37.14
Minimum settling velocity of 50% of particles (mm s^1)	1.14
Time for 50% of particles to settle over 1 m (hours)	0.244
D10 (µm)	2.76
Minimum settling velocity of 90% of particles (mm s^1)	0.01
Time for 90% of particles to settle over 1 m (hours)	44.343

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Polyphosphate
Sonication (s)	300

Sample visual assessment
Mud with some sand, rock and shell present.

Signatory: Jamie Woodward
Date: 14/03/2025

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Tel: 08 93602907 Address: 90 South St, Murdoch, WA, 6150

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Murdoch University

PARTICLE SIZE ANALYSIS REPORT

Contact: Jose Romero
Customer: GHD
Address: Level 10, 999 Hay Street, Perth WA 6000

Date of Issue: 14/03/2025
Date Received: 27/02/2025
Our Reference: GHD25-2

Sample Name:	R-Esb
Sampling Date:	24/02/2025
Sample Type:	Sediment
MAFRL Job Code:	GHD25-2
Client Reference:	12662246
Analysis Date:	11/03/2025
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**16.99**
Very Fine Silt % (4-8µm)	9.80
Fine Silt % (8-16µm)	11.85
Medium Silt % (16-31µm)	16.03
Course Silt % (31-63µm)	21.14
Total Silt (4-63µm)	**58.82**
Very Fine sand % (63-125µm)	14.66
Fine sand % (125-250µm)	4.90
Medium sand % (250-500µm)	2.22
Coarse sand % (500-1000µm)	1.07
Very Coarse sand % (1000-2000µm)	0.31
Total Sand (63-2000µm)	**23.16**
Total Gravels (>2000µm)	**1.03**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	1.07
1000	0.31
2000	1.03
4000	0.00
8000	0.00
16000	0.00

Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	26.14
Minimum settling velocity of 50% of particles (mm s^1)	0.56
Time for 50% of particles to settle over 1 m (hours)	0.493
D10 (µm)	2.24
Minimum settling velocity of 90% of particles (mm s^1)	0.00
Time for 90% of particles to settle over 1 m (hours)	67.147

Settings	
SOP Name	SOP-LV-3REPS-default.msop
Analysis Model	General Purpose
Result Units	Volume
Instrument	Mastersizer3000
RI/ABS:	2.74 / 1
Dispersant	Water
Additives	10mL Sodium Polyphosphate
Sonication (s)	300

Sample visual assessment
Mud with some sand and shell present.

Signatory: Jamie Woodward
Date: 14/03/2025

The results only apply to the sample as received and to the sample tested.
Spare test items will be held for two months unless otherwise requested.

Project name		Kimberley Supply Chain Cluster - Final Approvals Documentation					
Document title		Report | Results of February 2025 Marine Environmental Quality Survey					
Project number		12662246					
File name		12552246-SREP-1-2025_February_Water_Sediment_Quality_Survey.docx					
Status Code	Revision	Author	Reviewer		Approved for issue		
			Name	Signature	Name	Signature	Date
S0	1	J. Romero	T. Sleigh	T. Sleight	J. Romero		27/3/25

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