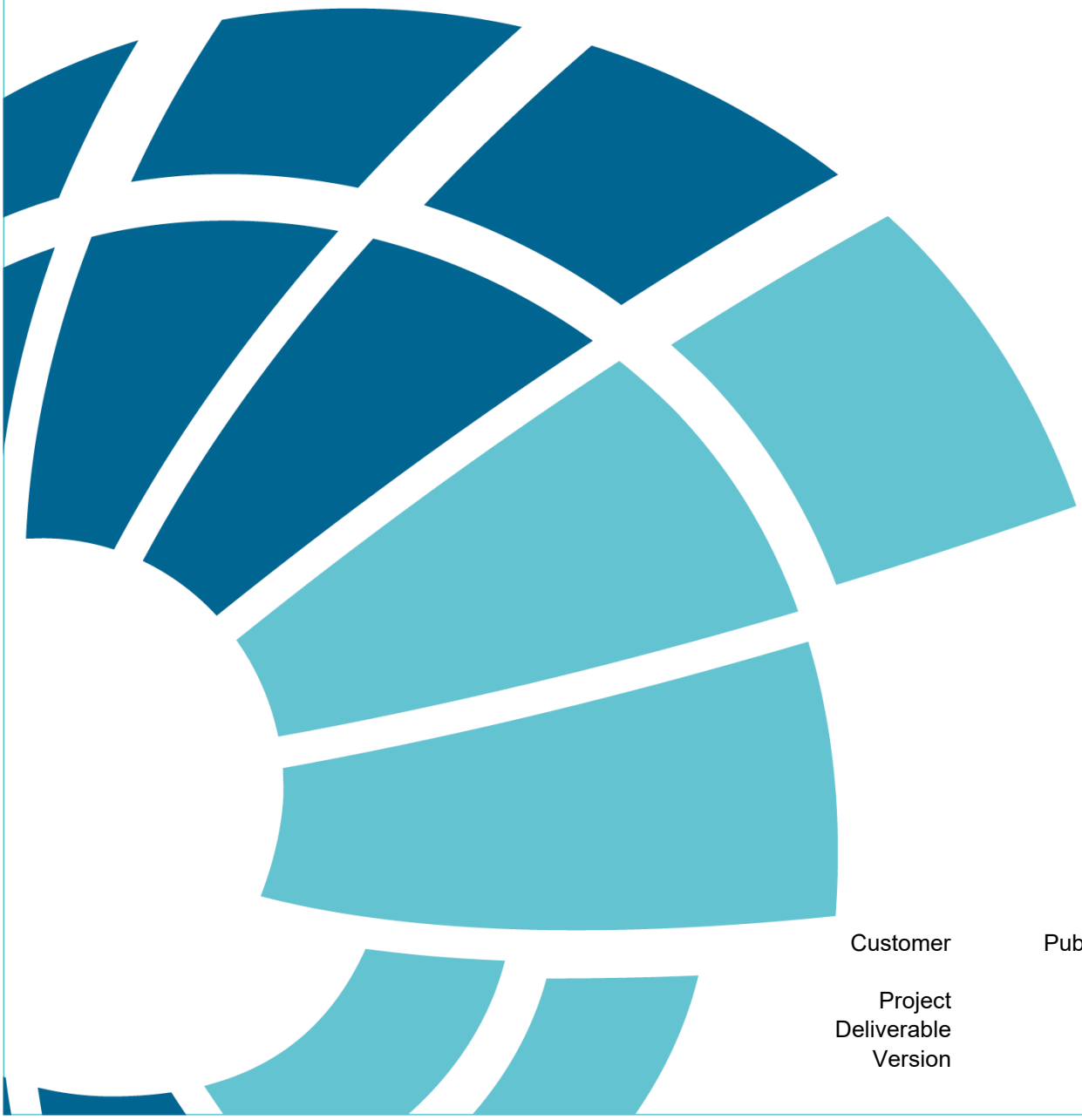
Sampling and Analysis Plan Implementation Report

Swan River Ferry Expansion – Perth to Applecross



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Author	S Cochrane
Reviewed By	L Synnot
Project Manager	A Kempton

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Executive Summary

The Public Transport Authority proposes to expand the public ferry service network in metropolitan Perth, Western Australia. Ferry terminals are proposed at Matilda Bay and Applecross, as well as an expansion of the existing terminal at Elizabeth Quay. Proposed construction methods comprise of piling for the installation of floating pontoons. To inform sediment characteristics of the three areas, investigative surficial samples were taken for chemical and physical analyses. Nine samples from the three areas were taken, plus quality assurance and quality control samples.

Sediments were analysed for the contaminants of potential concern identified in the SAP (BMT 2025) including metals, nutrients, organochlorine pesticides, hydrocarbons (polycyclic aromatic hydrocarbons, total recoverable/petroleum hydrocarbons, and benzene, toluene, ethylbenzene and xylene), organotins, polychlorinated biphenyls, antifoulants, per- and polyfluoroalkyl substances (PFAS), acid sulfate soil (ASS) and monosulfidic black ooze (MBO) parameters, and asbestos. Sediments were also analysed for particle size distribution and total organic carbon. Selective elutriate testing was performed on samples using local water from the Swan Canning Estuary. Analyte concentrations were compared to the Australian and New Zealand Marine and Freshwater Quality Default Guideline Values (ANZG DGVs; ANZG 2018), ANZG species protection levels (ANZG 2018), PFAS National Environmental Management Plan guidelines (HEPA 2025), and criteria of ASS and MBOs (DER 2015a,b; Simpson et al. 2018; Sullivan et al. 2018).

Results of sediment sampling from the proposed ferry terminals are summarised below:

- Exceedances of ANZG DGVs in metals were detected at several Elizabeth Quay and Matilda Bay sampling sites; namely copper, lead, mercury, nickel and zinc (ANZG 2018). No metal exceedances were detected at Applecross sites. Exceedances of bioavailable lead and zinc were detected at Matilda Bay. One exceedance of elutriate cobalt was detected at Applecross (ANZG 2018).
- Exceedances of ANZG DGVs in elutriate nutrient concentrations were detected at all sites (ANZG 2018).
- Concentrations of hydrocarbons and organotins in sediments did not exceed the relevant guidelines (ANZG 2018), with many analytes undetected (i.e., below the laboratory limit of reporting) across sites.
- No antifoulants, polychlorinated biphenyls or organochlorine pesticides were detected at any site.
- No asbestos was detected at any site.
- PFAS were detected in sediments at all sites, with elutriate concentrations exceeding interim marine guidelines for one species at all sites (perfluorooctanesulfonic acid; PFOS; HEPA 2025).
- Several sites indicated potential ASS, however acid-based accounting suggested the neutralising capacity of the sediments and surrounding seawater was sufficient to neutralise actual ASS. However, several sites exceeded multiple MBO criteria, suggesting MBOs are present.
- Particle size analysis showed sites were predominantly comprised of sand or silts.

Disturbance of sediments from piling has a potential risk of impacting the surrounding estuarine environment through the resuspension of contaminated sediments. Sediment sampling results suggest disturbance of sediments at Elizabeth Quay and Matilda Bay may result in the release of bioavailable

lead and zinc, which in elevated concentrations in enclosed waters can be acutely toxic to marine organisms. At all three sites there is a potential for the release of nutrients which can result in eutrophication. Finally, there is potential for shading of nearby benthic habitats during construction, however settling velocities suggest the risk will be limited. An environmental impact assessment is required to comprehensively inform the risk of construction activities to the surrounding environment and to adequately assess the potential cause and effect pathways.

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Acronyms and measurement units

Acronyms	
ABA	Acid base accounting
ANC	Acid neutralising capacity
ASS	Acid sulfate soils
AVS	Acid volatile sulfur
BTEX	Benzene, toluene, ethylbenzene and xylene
DBCA	Western Australian Department of Biodiversity, Conservation and Attractions
DBT	Dibutyltin
DGVs	Default Guideline Values
DoT	Western Australian Department of Transport
EGV	Ecological Guideline Value
FF	Fitness factor
FRP	Filtrable reactive phosphorus
GDA	Geocentric Datum of Australia
HHIL	Human Health Investigation Level
LoR	Limit of reporting
MBOs	Mono-sulfidic black oozes
MBT	Monobutyltin
NAGD	National Assessment Guidelines for Dredging
NATA	National Association of Testing Authorities
NH_3	Ammonia
NH_4^+	Ammonium
NO_x	Nitrate + nitrate
OCPs	Organochlorine pesticides
PAHs	Polycyclic aromatic hydrocarbons
PC	Physical/chemical
PCBs	Polychlorinated biphenyls
PFAS	Per- and polyfluoroalkyl substances
PFAS NEMP	Per- and polyfluoroalkyl substances National Environmental Management Plan
pHKCL	Potassium chloride suspension

PSD	Particle size distribution
PTA	Public Transport Authority
QA/QC	Quality Assurance/ Quality Control
RSD	Relative standard deviation
SAP	Sampling Analysis Plan
SAPIR	Sampling Analysis Plan Implementation Report
SCR	Swan Canning Riverpark
SNAS	Net acid soluble sulfur
TAAKCl	Titratable actual acidity
TBT	Tributyltin
TKN	Total Kjeldahl nitrogen
TN	Total nitrogen
TOC	Total organic carbon
TP	Total phosphorus
TRHs	Total recoverable hydrocarbons
UCL	Upper confidence limit
UTM	Universal Transverse Mercator
WA	Western Australia
Measurement Units	
±	Plus or minus
≤	Less than or equal to
<	Less than
>	Greater than
%	Percent
mg/kg	Milligrams per kilogram
µg/kg	Microgram per kilogram
µg Sn/kg	Microgram of tin per kilogram
µg/L	Microgram per litre

1 Introduction and Purpose

The Public Transport Authority (PTA) proposes to expand the public ferry service network in metropolitan Perth, Western Australia (WA) (hereafter; the Project). The proposed expansion involves linking the existing ferry route between Elizabeth Quay and South Perth, downstream to Matilda Bay and Applecross (hereafter; Landing Sites; Figure 1.1).

The Project is within the Swan Canning Estuary located downstream of the Swan and Canning Rivers and is a salt-wedge urban estuary which receives ocean flushing from the Indian Ocean and river flow from the Avon and Swan coastal catchments (Kilminster 2010). These catchments contain urban, agricultural and industrial land uses. The proposed ferry routes are in the Swan Canning Riverpark (SCR) managed by WA Department of Biodiversity, Conservation and Attractions (DBCA). The SCR supports commercial and tourism activities, as well as diverse ecosystems.

Passenger terminals comprised of fixed jetties, with a gangway to floating pontoons for berthing are proposed for installation at the Landing Sites via piling or other construction methods to be determined as the Project progresses from concept to final design. Investigative sediment samples were collected at the Landing Sites in line with the Sampling Analysis Plan (SAP; Annex A; BMT 2025) to inform Project design and provide contemporary sediment quality data for environmental approval purposes. Sediment sampling methods and analysis results are described herein in this SAP Implementation Report (SAPIR).

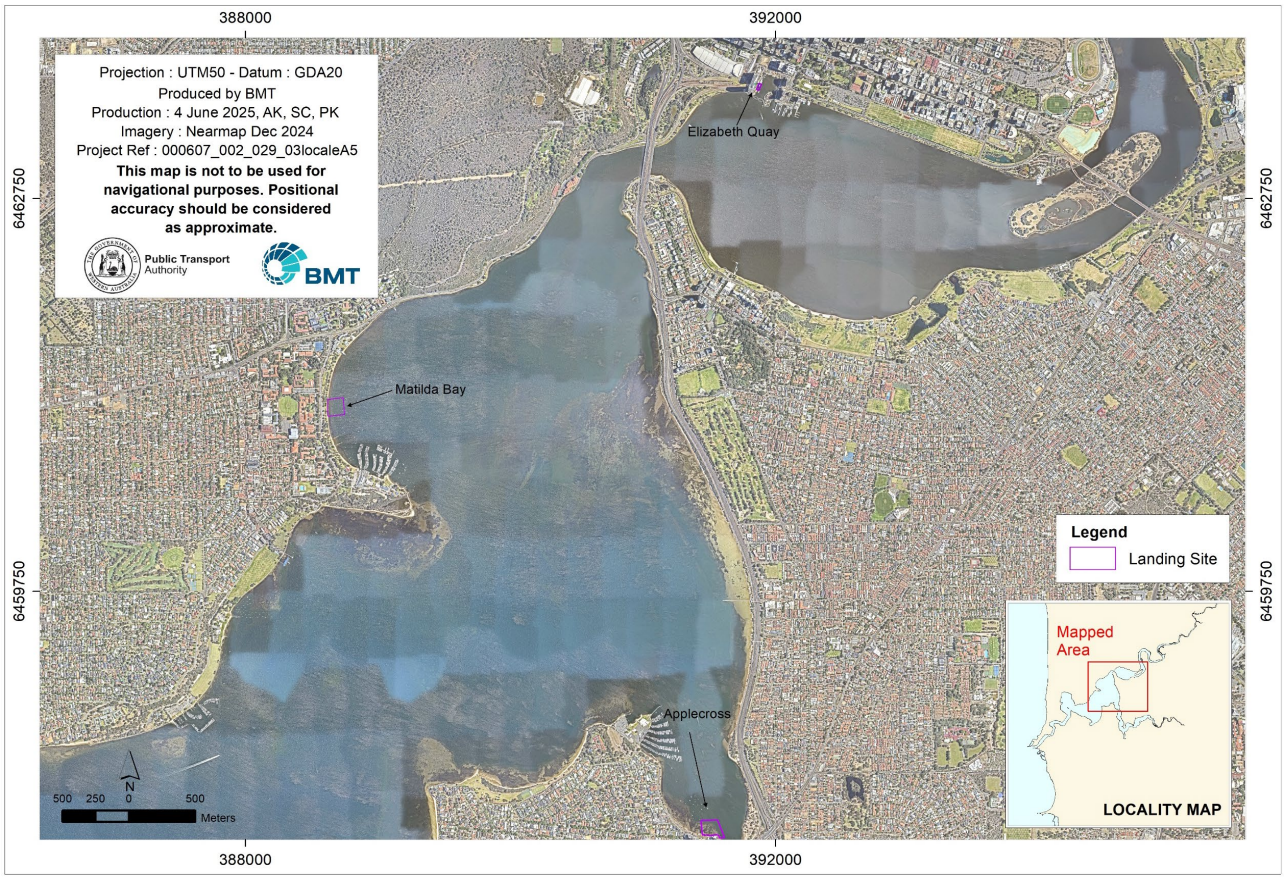


Figure 1.1 Proposed locations of the Swan River Ferry Expansion Landing Sites

2 Sediment Sampling and Analysis

2.1 Sediment sampling methods

Sediment samples from within the Landing Sites were collected 10 April 2025 in accordance with the National Assessment Guidelines for Dredging (NAGD; CA 2009), Australia and New Zealand Marine and Freshwater Guidelines (ANZG 2018) and Per- and Polyfluoroalkyl Substances National Environmental Management Plan (PFAS NEMP) guidelines (HEPA 2025). While the construction of the Landing Sites is not anticipated to involve dredging or ocean disposal, the NAGD (CA 2009) provides a useful framework for sediment sampling and assessment in combination with the other relevant guidelines (ANZG 2018, HEPA 2025). Sampling methods are detailed in a site-specific sediment SAP (Annex A; BMT 2025)[1].

Based on the proposed footprint of the proposed Landing Sites, three sediment samples were collected from within three sampling areas at (Table 2.1; Figure 2.1):

- Elizabeth Quay
- Matilda Bay
- Applecross

Surface grabs to a maximum depth of~20 cm were collected at Landing Sites. A total of 9 sites were sampled and the proposed sediment sample sites were positioned randomly within sampling areas using geographic information system software. Actual site coordinates are presented in Table 2.1 and Figure 2.1. Further details on the sampling design and rationale are provided in the SAP (Annex A; BMT 2025).

[1] This SAP Implementation Report was developed to report sediment quality data for three Landing Site locations only; however, the SAP (BMT 2025) details a broader sampling campaign to support the full Project planning and design

Table 2.1 Sediment sampling site coordinates and sampling depth within the Swan River Ferry Expansion Landing Sites

Sampling area[1]	Site[1]	Coordinates (UTM50 GDA94)[3]		Target sampling depth (cm)
		Easting	Northing	
Elizabeth Quay Landing Site	EQ1	391871	6463613	~20
	EQ2[T]	391867	6463594	
	EQ3	391870	6463617	
Matilda Bay Landing Site	MB4	388638	6461154	
	MB5	388687	6461156	
	MB6	388655	6461136	
Applecross Landing Site	AP1	391509	6457952	
	AP2	391572	6457962	
	AP3	391442	6457971	

Notes:

1. Refer to Figure 2.1 for locations of sampling areas and sites.
2. 'T' = quality assurance and quality control (QA/QC) triplicate sampling site.
3. 'GDA' = Geocentric Datum of Australia; 'UTM' Universal Transverse Mercator.

Figure 2.1 Sediment sampling site locations within the Swan River Ferry Expansion Landing Sites

2.1.2 Sampling quality assurance and quality control

The following type of quality assurance and quality control (QA/QC) sample was collected (ANZG 2018, CA 2009):

- Triplicate: three separate samples were collected from the same site to determine the variability of the physical and chemical sediment characteristics at the scale of sampling.

For the proposed sampling design, one site (EQ2) within the Elizibeth Quay Landing Site was a triplicate QA/QC sample. Further samples to satisfy QA/QC requirements for the broader Project sample design (Annex A; BMT 2025) were collected as part of the sampling regime; however, these are not detailed in this report which has been prepared for Landing Sites only.

PFAS presents a high risk of contamination in the field and in the laboratory therefore trip blanks and rinsate blanks were collected to assess potential PFAS cross-contamination during sampling and transport in accordance with the PFAS NEMP (HEPA 2025). For the rinsate, deionised water was used to rinse the field equipment utilised during sediment sampling and tested for potential PFAS contamination. HEPA (2025) requires rinsate blanks to be collected at a rate of at least one for every ten primary samples and therefore one rinsate blank was collected for the survey design. A set of triplicate samples including inert sediment samples and deionised water provided by the laboratory were taken in-field but not interacted with during sampling to test for potential PFAS contamination of samples during transport.

To avoid cross-contamination among sampling areas and sites, all sampling equipment was washed after each sampling site and rinsed with site water. PFAS free cleaning agents (i.e. Liquinox) were used for cross contamination control, with sampling equipment triple-rinsed prior to each sample. Field staff wore nitrile gloves while handling sampling equipment, changing these between sample collections at each site. Further details on sources of PFAS contamination considered before, during and after field sampling and associated control/elimination measures adopted can be found in the SAP (BMT 2025). Samples were stored and transported as per the SAP (BMT 2025).

2.2 Sediment analysis methods

2.2.1 Sediment analytes and rationale

Laboratory analyses were performed to characterise relevant physical and chemical properties of sediment samples, with analyte selection rationale based on likely cause effect pathways of contaminants of potential concern identified in the SAP (Annex A; BMT 2025). A summary of the sample areas and contaminants analysed is provided in Table 2.2. Further details regarding the justification for the sampling regime and testing conducted for each analyte and laboratory methods are provided in the SAP (BMT 2025).

Table 2.2 Laboratory analysis plan for sediment samples for the Swan River Ferry Expansion Landing Sites

Sampling area[1]	Site[1]	Metals[3]	PSD[2]	TOC[2]	Hydrocarbons[4]	Elutriate Nutrients[5]	ASS and MBOs[2]	Organotins[6]	PFAS[2]	OCPs[2]	PCBs[2]	Antifoulants[7]	ACM[2]
Elizabeth Quay Landing Site	EQ1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	EQ2[T]	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	EQ3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Matilda Bay Landing Site	MB4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	MB5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	MB6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Applecross Landing Site	AP1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	AP2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	AP3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Notes:

1. Refer to Figure 2.1 for locations of sampling areas and sites.
2. "ACM" = asbestos containing material, "ASS" = acid sulfate soils, "MBO" = mono-sulfidic black oozes, "OCPs" = organochloride pesticides, "PCBs" -= polychlorinated biphenyls, "PFAS" = per- and poly-fluoroalkyl substances, "PSD" = particle size distribution, "TOC" = total organic carbon.
3. Metals = total aluminium, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, molybdenum, nickel, selenium, silver, vanadium and zinc.
4. Hydrocarbons = polycyclic aromatic hydrocarbons, total recoverable/petroleum hydrocarbons, benzene, toluene, ethylbenzene, xylene.
5. Elutriate nutrients = total phosphorus, filterable reactive phosphorus, total nitrogen, nitrate + nitrite, ammonium, ammonia, and total Kjeldahl nitrogen.
6. Organotin compounds = monobutyltin, dibutyltin, tributyltin.
7. Antifoulants = diruon, fluometuron, chlorothalonil, dichlofluanid.
8. EQ2 is triplicate quality assurance/quality control (QA/QC) sample site.
9. Refer to SAP (BMT 2025) for detailed list of analytes within analytical suites.

2.2.2 Particle size analysis

Sediment samples were analysed for particle size distribution by laser diffraction to categorise particle sizes between 0.02 and 500 µm. The particle size distribution for particles >500 µm was measured by wet sieving. Sedigraph analysis was the preferred method of particle size analysis given the anticipated high silt content of sediment in the Landing Sites (BMT 2025). However, sedigraphs were unavailable in WA National Association of Testing Authorities (NATA) laboratories and laser diffraction analysis was utilised as contingency analysis method.

2.2.3 Laboratory quality assurance/quality control

Laboratory reports of blanks, spikes, standards and duplicates testing as required by NATA and NAGD (CA 2009) are provided in Annex B.

2.3 Data analysis methods

2.3.1 Particle settling times

Stokes' Law was used to calculate the particle settling velocities of the time required for 50% and 90% of suspended particles to settle in 1 m of water for each sediment sample. Due to the unavailability of sedigraphs in WA NATA laboratories (Section 2.2.2), settling velocities were not able to be analysed using a sedigraph. Settling velocities of samples containing >45% silt and clay should therefore be considered an approximation only, as Stokes' Law is not applicable for material with high fines content.

2.3.2 Normalisation of organics

Total organic carbon (TOC) is the main binding constituent for organic substances in marine sediments. The NAGD (CA 2009) and ANZG (2018) require organics including total petroleum hydrocarbons (TPHs), total recoverable hydrocarbons (TRHs), polycyclic aromatic hydrocarbons (PAHs), benzene, toluene, ethylbenzene and xylene (BTEX), organotins (tributyltin [TBT], dibutyltin [DBT] and monobutyltin [MBT]), organochlorine pesticides (OCPs), polychlorinated biphenyls (PCBs), antifoulants (diuron, fluometuron, chlorothalonil, dichlofluanid) and PFAS (HEPA 2025) to be normalised to 1% TOC for appropriate comparison to relevant guidelines. The normalised results allow for comparison of different sediment samples and provide an indication of the bioavailability of organic analytes. A TOC greater than 1% increases the binding capacity of organics to become less biologically available, therefore normalisation will reduce the measured value proportionally (the reverse also applies). Normalisation is appropriate over a TOC range of 0.2–10%. For TOC <0.2% or TOC >10%, the maximum and minimum values of 0.2 and 10% TOC are used for normalisation, respectively. Where the organic data were below the laboratory limit of reporting (LoR) normalisation was not completed.

2.3.3 Assessment against guidelines

Australian & New Zealand Guidelines for Fresh and Marine Water Quality

Contaminant concentrations in sediment samples were compared to the ANZG Default Guideline Values (DGVs). Given the small number of samples, individual sample concentrations were compared to DGVs.

Contaminants in sediments that exceed ANZG DGVs during first phase assessment require elutriate testing to assess potential impacts to marine water quality from release during sediment disturbance (CA 2009). Individual elutriate concentrations were compared to DGVs for toxicants and physical chemical (PC) stressors from ANZG (ANZG 2018, ANZECC/ARMCANZ 2000) as per the NAGD (CA 2009). As no guidelines are available for total nutrients in sediments, elutriate nutrient testing was initiated in the first phase analysis for assessment against ANZG 2018/ANZECC/ARMCANZ 2000 DGVs.

Toxicant elutriate concentrations (metals and ammonia [NH_3]) were compared to the ANZG (2018) marine DGVs for 95% species protection. The 99% marine DGVs were applied depending on the analyte suite

(i.e. bioaccumulating toxicants). ANZECC/ARMCANZ (2000) DGVs for PC stressors for estuaries of south-west Australia (slightly disturbed ecosystems) were applied to nitrate+nitrate (NO_x), ammonium (NH_4^+), total nitrogen (TN), total Kjeldahl nitrogen (TKN) and total phosphorus (TP) as no Integrated Marine and Coastal Regionalisation of Australia zone is available in ANZG (2018) for estuaries.

Per- and polyfluoroalkyl substances National Environmental Management Plan
Currently no published guidelines are available for PFAS in aquatic sediments in the most recent version of the PFAS NEMP 3.0 (HEPA 2025); however, the guideline provides a useful framework for sampling and can be used for indicative comparison to the PFAS soil guideline and interim marine water guidelines.

Individual concentrations of sediment samples from the Landing Sites were assessed against the Ecological Guideline Values (EGVs) and Human Health Investigation Levels (HHILs) for soils from PFAS NEMP (HEPA 2025). Elutriate concentrations of PFAS species (with a relevant guideline) were compared to the interim marine 99% species protection – high conservation value systems guideline for a bioaccumulating toxicant (HEPA 2025).

2.3.4 Acid sulfate soils and acid base accounting

The reduced inorganic sulfur content (SCr [%S]) was assessed against the texture-based Action Criteria (DER 2015a) and where exceeded, the total net acidity was calculated via acid-base accounting (ABA), providing an estimate of the actual and potential acidity of a sediment sample, using the following equation (Ahern et al. 2004):

$$Net\ acidity = Potential\ sulfidic\ acidity + Existing\ acidity - \ ANC/FF$$

where:

- potential sulfuric acidity of the sediment (SCr) is converted from %S to mol H+/tonne by multiplying by 623.7.
- existing acidity (in mol H+/tonne) is the titratable actual acidity (TAAKCl) and/or net acid soluble sulfur (SNAS). If there is no existing acidity i.e. the sample has a potassium chloride suspension (pHKCl) greater than 6.5, the TAAKCl or SNAS is assumed to be zero and the existing acidity term is neglected.
- ANC is the acid neutralising capacity of the sediment to naturally neutralise acid produced (for example, due to the presence of carbonate material). ANC is represented by ANCBT (converted from %CaCO3 to mol H+/tonne by multiplying by 199.8). The ANC is assumed to be zero if there is existing acidity.
- FF is the fineness factor. As samples are finely ground in the laboratory, the net acid risk likely to be experienced in the field could be underestimated by the laboratory results. To allow for this, the measurement of ANC was divided by a FF during ABA. The minimum FF that should be applied to any ANC is 1.5; however, larger factors (e.g. 2, 2.5 or 3) may be applicable for shell or other forms of neutralising inclusions in the soil (DER 2015a).

If the results of the subsequent ABA indicate the net acidity is negative, then there is a low likelihood of ASS generation. If net acidity is positive, there is the potential for ASS generation.

2.3.5 Mono-sulfidic black oozes

To assess the potential for the presence of mono-sulfidic black oozes (MBOs) within the Landing Sites, an assessment of indicators of MBOs was undertaken. Data was compared to the criteria for assessing

indicators of MBOs outlined in Table 2.3. PSD data was considered for context in the assessment of indicators of MBOs.

Table 2.3 Indicators of Mono-sulfidic black oozes and associated criteria for assessment

Parameters	Method	Criteria for assessment
Visual appearance	Field observation	Distinct strong black/dark grey colour, gel-like consistency and/or oily appearance
Smell	Field observation	Distinct 'rotten egg' odour
Organic matter content	Laboratory analysis	Greater than 5%
Moisture content	Laboratory analysis	Greater than 60% by weight
Acid volatile sulfur (AVS)	Laboratory analysis	Equal to or greater than 0.01% AVS

Note:

1. Criteria developed from DWER (2021), DER (2015a, b), Simpson et al., (2018) and Sullivan et al., (2018).

2.3.6 Quality assurance and quality control data analysis

The accuracy of sediment analyses was determined by quantifying the differences between the concentrations of analytes in the QA/QC samples, using the methods outlined in NAGD (CA 2009). The relative standard deviation (RSD) was calculated for analyte concentrations in the triplicate sample as follows:

$$RSD\ (\%) = \ ((standard\ deviation\ of\ triplicate\ samples) x\ 100)/((average\ of\ triplicate\ samples))$$

The triplicate samples should agree within an RSD of ±50%. RSDs greater than 50% may indicate that the sediments are heterogeneous or greatly differ in grain size (CA 2009). The RSD was only calculated if all QA/QC sample concentrations were above the LoR. If one or more of the analyte concentrations were below the LoR, the individual concentrations were compared to assess the magnitude of the differences between them.

3 Sediment Analysis Results

3.1 Physical sediment characteristics

3.1.1 Visual and odour characterisation

Sediments from the Landing Sites comprised predominantly dark brown–black clays and sands (Table 3.1). All samples were well sorted–very well sorted. Organic matter (seagrass/wrack) was recorded in sediments at four sites (Table 3.1). Shell fragments were observed at majority of Landing Sites in six samples and biota (worms/crabs) were present in one sample from Elizabeth Quay Landing Site and two samples from Matilda Bay Landing Site (Table 3.1). No sulfidic odour was reported in sediment samples (Table 3.1). Sediment characteristics were predominantly uniform among sampling areas.

Table 3.1 Field description log of the Swan River Ferry Expansion Landing Sites sediment samples

Sampling Area[1]	Site[1]	Munsell colour		Texture	Sorting	Organic matter	Sulfidic odour	Comments	Photos
Elizabeth Quay Landing Site	EQ1	2.5Y 2.5/1		Clay	Well sorted	NA	N	NA	
	EQ2_1[T]	2.5Y 2.5/1		Clay	Well sorted	NA	N	NA	
	EQ2_2[T]	2.5Y 2.5/1		Clay	Well sorted	Shell fragments	N	Worms present	
	EQ2_3[T]	2.5Y 2.5/1		Clay and sand	Well sorted	Shell fragments Metallic fragments Rocks	N	NA	No photo
	EQ3	2.5Y 2.5/1		Clay	Well sorted	Rocks	N	NA	
Matilda Bay Landing Site	MB4	2.5Y 2.5/1		Sand with clay	Well sorted	Seagrass wrack Shell fragments	N	Hermit crabs present	

Sampling Area[1]	Site[1]	Munsell colour	Texture	Sorting	Organic matter	Sulfidic odour	Comments	Photos
Applecross Landing Site	MB5	2.5Y 2.5/1	Clay	Well sorted	NA	N	Worms present	
	MB6	2.5Y 2.5/1	Sand and clay	Well sorted	Seagrass wrack Shell fragments	N	NA	
	AP1	2.5Y 4/3	Sand	Well sorted	Seagrass wrack Shell fragments	N	NA	No photo
	AP2	2.5Y 2/1	Clay	Very well sorted	Shell fragments	N	N	
	AP3	10YR 4/2	Sand	Well sorted	Seagrass wrack	N	N	

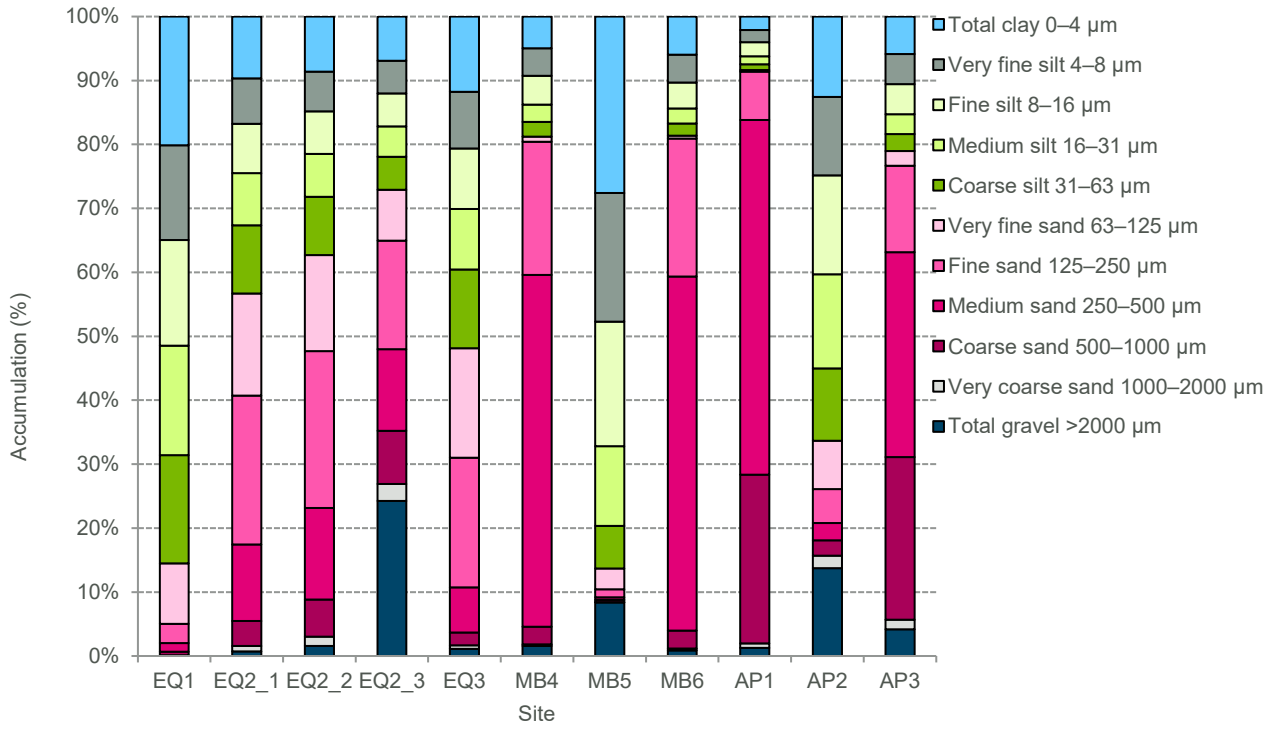
Notes:

1. Refer to Table 2.1 and Figure 2.1 for explanation of sampling areas and sites.
2. The colours presented in the table are intended to provide a visual RGB representation of the Munsell Soil Colour. Colours were determined using https://www.munsellcolourscienceforpainters.com/MunsellResources/Munsell-to-RGB-Tables.xlsm.
3. T = triplicate QA/QC sample.
3. Y' = yes, 'N' = no, 'NA' = not applicable, no photo = image not captured due to camera malfunction in field.

3.1.2 Particle size distribution

Sediments from the Landing Sites were variable in composition. Portions of clay, silt, sand and gravel were present in all samples (Figure 3.1, Table 3.1). At Elizabeth Quay Landing Sites (EQ1–EQ3), sand was the predominant particle size, except for site EQ1 which comprised ~65% silt (Figure 3.1, Table 3.1). Triplicate EQ2_3 contained higher portions of gravel than the other triplicates. At Matilda Bay Landing Sites (MB4–MB6), MB5 comprised predominantly silts, with high portions of clay, comparatively to MB4 and MB6 that comprised predominantly sands. At Applecross Landing Sites (AP1–AP3), sand was the dominant particle size, except for site AP2 which contained ~54% silts (Figure 3.1, Table 3.1).

Full laboratory reports are provided in Annex B



Notes:

1. **Refer to Table 2.1 and Figure 2.1 for explanation of sampling areas and sites.**
2. **Triplicate QA/QC sediment sample indicated by the suffix "_1", "_2", "_3".**

Figure 3.1 Particle size distributions of the sediment samples from the Swan River Ferry Expansion Landing Sites

Table 3.1 Particle size distributions of the sediment samples from the Swan River Ferry Expansion Landing Sites

Sediment site[1]		Elizabeth Quay Landing Site			Matilda Bay Landing Site			Applecross Landing Site		
Category	Size (µm)	EQ1	EQ2[T]	EQ3	MB4	MB5	MB6	AP1	AP2	AP3
Total gravel	**>2000**	**0.02**	**8.85**	**1.11**	**1.59**	**8.39**	**0.86**	**1.25**	**13.72**	**4.16**
Very coarse sand	1000–2000	0.11	1.65	0.54	0.21	0.06	0.29	0.72	1.97	1.52
Coarse sand	500–1000	0.54	6.00	2.03	2.77	0.33	2.80	26.38	2.42	25.41
Medium sand	250–500	1.33	12.99	7.06	55.01	0.39	55.37	55.48	2.68	32.05
Fine sand	125–250	3.05	21.58	20.26	20.81	1.25	21.61	7.57	5.32	13.51
Very fine sand	63–125	9.45	12.98	17.12	0.82	3.28	0.46	0.27	7.54	2.33
Total sand	**63–2000**	**14.47**	**55.21**	**47.01**	**79.62**	**5.31**	**80.54**	**90.42**	**19.93**	**74.82**
Coarse silt	31–63	16.93	8.30	12.34	2.31	6.64	1.87	0.87	11.35	2.65
Medium silt	16–31	17.09	6.54	9.46	2.71	12.48	2.34	1.27	14.68	3.09
Fine silt	8–16	16.54	6.49	9.43	4.51	19.45	4.05	2.18	15.47	4.68
Very fine silt	4–8	14.79	6.14	8.86	4.29	20.13	4.38	1.90	12.27	4.73
Total silt	**4–63**	**65.35**	**27.56**	**40.08**	**13.83**	**58.70**	**12.64**	**6.22**	**53.77**	**15.15**
Total clay	**0–4**	**20.15**	**8.38**	**11.79**	**4.96**	**27.61**	**5.96**	**2.12**	**12.58**	**5.86**

Notes:

1. Refer to Table 2.1 and Figure 2.1 for explanation of sampling areas and sites.
2. **Red text** indicates the dominant size fraction in each sample.
3. T= triplicate QA/QC sample and results have been averaged to provide a single percentage for site EQ2.

3.1.3 Settling times

The settling time for 50% of particles to settle though 1 m of water ranged between 0.12 (site AP1) and 271 minutes (~5 hours; site MB5) for the sediment samples within the Landing Sites (Table 3.2). The time for 90% of the particles to settle through 1 m of water ranged between 0.01 (site AP1) and 121.81 hours (~5 days; site MB5). Longer setting times for sample MB5 are likely attributed to greater silt proportions in the sample (Table 3.2).

Table 3.2 Settling times of sediment samples from the Swan River Ferry Expansion Landing Sites

Sampling area[1]	Sediment site[1]	Time for 50% of particles to settle through 1 m (mins)	Time for 90% of particles to settle through 1 m (hours)
Elizabeth Quay Landing Site	EQ1	88.74	72.76
	EQ2[T]	1.48	14.50
	EQ3	6.12	28.87
Matilda Bay Landing Site	MB4	0.24	4.23
	MB5	271.02 (~4.5 hours)	121.81 (~5 days)
	MB6	0.24	5.83
Applecross Landing Site	AP1	0.12	0.01
	AP2	33.72	30.85
	AP3	0.18	6.20

Notes:

1. Refer to Table 2.1 and Figure 2.1 for explanation of sampling areas and sites.
2. Settling times for all samples were calculated using Stokes' Law which is not considered appropriate for use if material has >45% silt and clay content (Section 2.2.2)
3. T=Triplicate QA/QC sample and results have been averaged to provide a single value for site EQ2.

3.2 Total organic carbon

TOC content was variable in sediment samples among Landing Sites, ranging from 0.16% (AP1) to 3.6% (MB5; Table 3.3).

Full laboratory reports are provided in Annex B.

Table 3.3 Total organic carbon content of sediment samples from the Swan River Ferry Expansion Landing Sites

Sampling area[1]	Sediment site[1]	Total organic carbon (%)
Elizabeth Quay Landing Site	EQ1	2.40
	EQ2[T]	0.61
	EQ3	0.88
Matilda Bay Landing Site	MB4	0.19
	MB5	3.60

Sampling area[1]	Sediment site[1]	Total organic carbon (%)
	MB6	0.23
Applecross Landing Site	AP1	0.16
	AP2	3.00
	AP3	0.21

Notes:

1. Refer to Table 2.1 and Figure 2.1 for explanation of sampling areas and sites.
2. T= triplicate QA/QC sample and results were averaged to provide a single concentration for site EQ2.

3.3 Nutrients

3.3.1 Elutriate nutrients

Several sample concentrations of elutriate TP, FRP, TN and ammonium (NH_4) collected at Landing Sites exceeded the relevant ANZECC/ARMCANZ (2000) DGVs for PC stressors (Table 3.4). Two sample concentrations of ammonia (NH_3) exceeded the ANZG (2018) DGV for 95% species protection level for toxicants (sites EQ3 and MB4; ANZG 2018). Elutriate TKN concentrations ranged from 795 µg/L to 4895 µg/L (Table 3.4). Elutriate concentrations of NO_x were reported below LoR (5 µg/L) for all sites.

Full laboratory reports are provided in Annex B.

Table 3.4 Elutriate nutrient concentrations of sediment samples from the Swan River Ferry Expansion Landing Sites

Sampling area[1]	Sediment site[1]	Elutriate nutrients (µg/L)						
		TP	FRP	TN	NO_x	NH_3	NH_4^+	TKN
ANZECC/ARMCANZ (2000) DGVs for PC stressors[2,3]		30	5	750	45	–	40	–
ANZG (2018) DGV for 95% species protection level[3,4,5]		–	–	–	–	910	–	–
Elizabeth Quay Landing Site	EQ1	82	20	800	<5	430	430	795
	EQ2[T]	62	23	827	<5	393	393	822
	EQ3	79	<5	4900	<5	2900	2900	4895
Matilda Bay Landing Site	MB4	100	6.1	4000	<5	2300	2300	3995
	MB5	140	52	1000	<5	370	370	995
	MB6	46	<5	1400	<5	800	800	1395
Applecross Landing Site	AP1	120	<5	1400	<5	440	440	1395
	AP2	100	77	1100	<5	460	460	1095
	AP3	41	<5	950	<5	440	440	945

Notes:

1. Refer to Table 2.1 and Figure 2.1 for explanation of sampling areas and sites.
2. ANZECC/ARMCANZ (2000) DGVs for PC stressors for estuaries of south-west Australia (slightly disturbed ecosystems) were applied to ammonium, nitrate+nitrite, total nitrogen, filterable reactive phosphorus and total phosphorus as majority of analytes were not

revised in ANZG (2018) published updates and no Integrated Marine and Coastal Regionalisation of Australia zone is available for estuaries.

3. TP = total phosphorus; FRP = filterable reactive phosphorus; TN = total nitrogen; TKN = total Kjeldahl nitrogen; NOx = nitrate + nitrite; NH^{4+} = ammonium; NH_3 = ammonia; ANZG = Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG 2018); ANZECC/ARMCANZ = Australian and New Zealand Environment and Conservation Council & Agriculture and Resource Management Council of Australia and New Zealand (ANZECC/ARMCANZ 2000); DGV = default guideline value; PC = physical and chemical, NA = summary test statistic not calculated as per Section 2.3.3.
4. ANZG (2018) DGV for toxicants in marine waters 95% species protection level applicable for assessment (BMT 2025).
5. Ammonia is included as both a physical-chemical stressor and a toxicant.
6. T= triplicate QAQC sample and results were averaged to provide a single concentration for site EQ2.
7. Red text indicates individual concentration has exceeded relevant ANZG (2018)/ANZECC/ARMCANZ (2000) DGVs.

3.4 Metals

3.4.1 Total metals

Test statistics (medians) were not calculated for total metal concentrations in sediments as minimum sample numbers were not met in each Landing Site (Section 2.3.3). Individual sample site concentrations were compared to guidelines (Section 2.3.3; Table 3.5).

Aluminium concentrations in sediment samples varied among Landing Sites and ranged 730–38,000 mg/kg (Table 3.5). Antimony concentrations in sediment samples among Landing Sites were below LoR except for site EQ1 (0.6 mg/kg; Table 3.5) and met the ANZG DGV (ANZG 2018). Arsenic concentrations in sediment samples ranged 0.8–15.0 mg/kg among Landing Sites and were below the ANZG DGV (ANZG 2018; Table 3.5). Barium concentrations in sediments ranged 0.8–42.0 mg/kg, beryllium concentrations in sediments ranged 0.3–1.3 mg/kg and boron concentrations in sediments ranged from 6.2–69.0 mg/kg (Table 3.5). Cadmium concentrations in sediments ranged from 0.1–0.2 mg/kg and were below the ANZG DGV (ANZG 2018; Table 3.5).

Concentrations of chromium VI were below LoR in all Landing Site sediment samples, and total chromium concentrations ranged from 2.0–75.0 mg/kg and were below the ANZG DGV (ANZG 2018; Table 3.5). Concentrations of cobalt in sediments from the Landing Sites ranged 0.5–15.0 mg/kg (Table 3.5). Copper concentrations in sediments from the Landing Sites ranged 3.4–110.0 mg/kg and site MB5 (110.0 mg/kg) exceeded the ANZG DGV (ANZG 2018; Table 3.5); however, was lower than the ANZG GV-high (CA 2009; ANZG 2018). Concentrations of iron in sediments from the Landing Sites ranged 1000–43,000 mg/kg (Table 3.5).

Three exceedances of the lead ANZG DGV (ANZG 2018) were recorded in sediment samples from the Landing Sites at EQ1 (61 mg/kg), EQ2 (120.7 mg/kg) and MB5 (110 mg/kg; Table 3.5). However, concentrations were lower than the ANZG GV-high (ANZG 2018). Lead concentrations in sediments at the remaining sites ranged from 3.6–36 mg/kg and were below the ANZG DGV (Table 3.5, ANZG 2018). Concentrations of manganese in sediments ranged 10.0–280.0 mg/kg among Landing Sites (Table 3.5).

Two exceedances of the mercury ANZG DGV (ANZG 2018) were recorded in Landing Site sediment samples from sites EQ1 and MB5 (0.3 mg/kg), however were lower than the ANZG GV-high (ANZG 2018; Table 3.5). Mercury concentrations in remaining sites ranged 0.0–0.1 mg/kg (Table 3.5).

Molybdenum concentrations in sediment samples from Landing Sites ranged 0.3–6.9 mg/kg (Table 3.5). One exceedance of the nickel ANZG DGV (ANZG 2018) was recorded in sediments at site MB5 (25 mg/kg); however; it was lower than the ANZG GV-high (ANZG 2018; Table 3.5). All other sites recorded nickel concentrations in sediments ranging 0.7–14 mg/kg (Table 3.5).

Selenium concentrations in sediment samples from the Landing Sites ranged from 0.1–0.8 mg/kg (Table 3.5). Silver concentrations in sediment samples from the Landing Sites ranged from 0.1–0.4 mg/kg and were below the ANZG DGV (ANZG 2018; Table 3.5). Vanadium concentrations in sediments from the Landing Sites ranged 3–84 mg/kg (Table 3.5). One exceedance of the zinc ANZG DGV (ANZG 2018) was recorded at site MB5 (390 mg/kg); however, it was lower than the ANZG GV-high (ANZG 2018; Table 3.5). Remaining sites recorded zinc concentrations in sediments ranging 9.3–190 mg/kg and were below the ANZG DGV (ANZG 2018; Table 3.5).

Full laboratory reports are provided in Annex B.

Table 3.5 Total metal concentrations of sediment samples from the Swan River Ferry Expansion Landing Sites

Sampling area[1]	Sediment site[1]	Total metals (mg/kg)																				
		Al	Sb	As	Ba	Be	Bo	Cd	Cr VI	Total Cr	Co	Cu	Fe	Pb	Mn	Hg	Mo	Ni	Se	Ag	V	Zn
ANZG DGV[2]		–	2	20	–	–	–	1.5	–	80 (total)	–	65	–	50	–	0.15	–	21	–	1	–	200
ANZG GV-high[2]		–	25	70	–	–	–	10	–	370 (total)	–	270	–	220	–	1	–	52	–	4	–	410
Elizabeth Quay Landing Site	EQ1	21,000	0.6	15.0	28.0	0.9	29.0	0.2	<1.0	51.0	9.9	55.0	35,000	61.0	140.0	0.3	2.2	14.0	0.5	0.3	63.0	190.0
	EQ2[T]	6233	<0.50	4.0	13.3	0.3	15.3	0.1	<1.0	21.0	3.3	18.3	11,933	120.7	59.7	0.1	0.8	5.6	0.1	0.1	22.0	55.3
	EQ3	11,000	<0.50	5.4	42.0	0.3	20.0	0.1	<1.0	25.0	4.7	29.0	17,000	29.0	110.0	0.1	0.9	7.0	0.2	0.2	31.0	97.0
Matilda Bay Landing Site	MB4	920	<0.50	0.8	1.2	0.3	11.0	0.1	<1.0	2.8	0.7	5.2	1300	4.6	13.0	0.0	0.6	0.9	0.1	0.1	4.2	23.0
	MB5	38,000	<0.50	13.0	27.0	1.3	69.0	0.2	<1.0	75.0	15.0	110.0	43,000	110.0	280.0	0.3	1.4	25.0	0.7	0.4	84.0	390.0
	MB6	1500	<0.50	0.8	1.3	0.3	10.0	0.1	<1.0	4.2	1.0	11.0	2200	6.9	18.0	0.0	0.3	1.8	0.1	0.1	5.4	23.0
Applecross Landing Site	AP1	730	<0.50	0.8	0.80	0.3	6.2	0.1	<1.0	2.0	0.5	3.4	1000	3.6	61.0	0.0	0.3	0.7	0.1	0.1	3.0	9.3
	AP2	22,000	<0.50	9.2	11.0	0.7	48.0	0.2	<1.0	35.0	7.1	38.0	23,000	36.0	190.0	0.1	6.9	12.0	0.8	0.1	43.0	140.0
	AP3	1500	<0.50	0.8	1.4	0.3	7.9	0.1	<1.0	3.2	0.6	4.7	1500	4.3	10.0	0.0	0.8	1.1	0.1	0.1	4.6	14.0

Notes:

1. Refer to Table 2.1 and Figure 2.1 for explanation of sampling areas and sites.
2. Al = Aluminium, Sb = Antimony; As = Arsenic; Ba = Barium; Be = Berylllium; Bo = Boron; Cd = Cadmium; Cr VI = Chromium Six; Total Cr = total chromium; Co = Cobalt; Cu = Copper; Fe = Iron; Pb = Lead; Mn = Manganese; Hg = Mercury; Mo = Molybdenum; Ni = Nickel; Se = Selenium; Ag = Silver; V = Vanadium; Zn = Zinc; ANZG = Australian and New Zealand Guidelines for Fresh & Marine Water Quality (ANZG 2018), DGV = Default Guideline Value, GV-high = upper guideline value, – = no guideline value available;
3. T= triplicate QA/QC sample and results were averaged to provide a single concentration for site EQ2.
4. **Red** text indicates an individual site has exceeded concentration has exceeded relevant ANZG (2018) DGV.

3.4.2 Bioavailable metals

Bioavailable metal analysis by dilute acid extraction was completed on copper, lead, mercury, nickel and zinc, which exceeded ANZG DGV (ANZG 2018) in total metal concentrations (Section 3.4.1; Table 3.6). Bioavailable metal concentrations were below the ANZG DGVs (ANZG 2018), with the exception of site MB5 which recorded an exceedance of lead and zinc (Table 3.6). Both concentrations were below the ANZG GV-high (ANZG 2018).

Full laboratory reports are provided in Annex B.

Table 3.6 Bioavailable metals concentrations for selected analytes in sediment samples from the Swan River Ferry Expansion Landing Sites

Sampling Area[1]	Sediment Site[1]	Total metals (mg/kg)				
		Cu	Pb	Hg	Ni	Zn
ANZG DGV[2]		65	50	0.15	21	200
ANZG GV-high[2]		270	220	1	52	410
Elizabeth Quay Landing Site	EQ1	33.0	36.0	<0.10	5.6	110.0
	EQ2[T]	9.2	23.4	<0.10	<1.0	30.7
	EQ3	19.0	21.0	<0.10	1.2	65.0
Matilda Bay Landing Site	MB4	3.2	5.0	<0.10	<1.0	12.0
	MB5	46.0	79.0	<0.10	2.6	280.0
	MB6	3.4	4.9	<0.10	<1.0	17.0
Applecross Landing Site	AP1	2.4	2.6	<0.10	<1.0	6.6
	AP2	16.0	21.0	<0.10	1.0	120.0
	AP3	3.2	3.2	<0.10	<1.0	9.8

Notes:

1. Refer to Table 2.1 and Figure 2.1 for explanation of sampling areas and sites.
2. Cu = Copper; Pb = Lead; Hg = Mercury; Ni = Nickel; Zn = Zinc; ANZG = Australian and New Zealand Guidelines for Freshwater and Marine Water Quality, DGV = default guideline value, GV-high = upper guideline value, T = triplicate QA/QC sample.
3. T= triplicate QA/QC sample and results were averaged to provide a single concentration for site EQ2.
4. Red text indicates individual concentration has exceeded relevant ANZG (2018) DGV.

3.4.3 Elutriate metals

Elutriate cobalt concentration at site AP1 exceeded the ANZG 95% marine DGVs (Table 3.7). Elutriate concentrations of antimony, arsenic, barium, boron, iron, manganese and molybdenum were detected across Landing Site samples; however, there are no ANZG (2018) DGV are available for comparison (Table 3.7).

Several elutriate metal analyte LoRs were raised during analysis due to suppression of the internal standard, which required samples to be diluted. This was likely due to the high level of salts in the samples. The adjustment resulted in several LoRs being higher than the analytes' DGV; namely chromium VI, cobalt, copper and silver (Table 3.7). These results are not reported as exceedances given the concentrations in water are undetermined.

Full laboratory reports are provided in Annex B.

Table 3.7 Elutriate metal concentrations of sediment samples from the Swan River Ferry Expansion Landing Sites

Sampling area[1]	Sediment sample[1]	Elutriate metals (µg/L)																				
		Al	Sb	As	Ba	Be	Bo	Cd	Cr VI	Total Cr[2]	Co	Cu	Fe	Pb	Mn	Hg	Mo	Ni	Se	Ag	V	Zn
ANZG (2018) DGV for 99% species protection		–	–	–	–	–	–	0.7	0.14	7.7	1[6]	0.3	–	2.2	–	0.1	–	7	–	0.8	50	3.3
ANZG (2018) DGV for 95% species protection		–	–	–	–	–	–	5.5	4.4	27.4		1.3	–	4.4	–	0.4	–	70	–	1.4	100	8
Elizabeth Quay Landing Site	EQ1	<20	2.8	4.7	34	<1	5300	<0.2	<50	<2	<2	<2	1400	<2	860	<0.05	30	<2	<2	<2	2.0	<2
	EQ2[T]	<20	2.3	2.6	29	<1	5567	<0.2	<50	<2	<2	<2	<20	<2	543	<0.05	18	<2	<2	<2	5.9	<2
	EQ3	<20	<2.0	2.8	28	<1	5700	<0.2	<50	<2	<2	<2	<20	<2	1300	<0.05	18	<2	<2	<2	3.9	<2
Matilda Bay Landing Site	MB4	<20	2.4	2.4	21	<1	5600	<0.2	<50	<2	<2	<2	<20	<2	340	<0.05	75	<2	<2	<2	3.3	<2
	MB5	<20	2.9	4.6	23	<1	5400	<0.2	<50	<2	<2	<2	<20	<2	1100	<0.05	23	<2	<2	<2	9.0	<2
	MB6	<20	2.0	2.0	21	<1	5800	<0.2	<50	<2	<2	<2	<20	<2	410	<0.05	55	<2	<2	<2	3.8	5.5
Applecross Landing Site	AP1	<20	4.4	3.4	24	<1	6000	<0.2	<50	<2	3.8	<2	<20	<2	110	<0.05	18	<2	<2	<2	4.0	2.9
	AP2	<20	4.5	9.7	22	<1	5600	<0.2	<50	<2	<2	<2	<20	<2	310	<0.05	64	<2	<2	<2	43.0	3.7
	AP3	<20	2.3	2.0	21	<1	5900	<0.2	<50	<2	<2	<2	<20	<2	180	<0.05	60	<2	<2	<2	3.3	4.3

Notes:

1. Refer to Table 2.1 and Figure 2.1 for explanation of sampling areas and sites.
2. Al = Aluminium, Sb = Antimony; As = Arsenic; Ba = Barium; Be = Beryllium; Bo = Boron; Cd = Cadmium; Cr = Chromium; Co = Cobalt; Cu = Copper; Fe = Iron; Pb = Lead; Mn = Manganese; Hg = Mercury; Mo = Molybdenum; Ni = Nickel; Se = Selenium; Ag = Silver; V = Vanadium; Zn = Zinc; ; Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG 2018); T = triplicate QA/QC sample.
3. ANZG (2018) DGV for toxicants in marine waters 95% species protection level applicable for assessment (BMT 2025). ANZG (2018) DGV for toxicants in marine waters 99% species protection level applicable for assessment of bioaccumulating toxicants (BMT 2025).
4. T= triplicate results were averaged to provide a single concentration for site EQ2.
5. Red text indicates individual concentration has exceeded relevant ANZG (2018) DGV.
6. As per EPA (2016) the 95% species protection DGV only will be applied to cobalt assessment.

3.5 Acid sulfate soils and mono-sulfidic black oozes

Samples collected from Landing Sites recorded pH values (measured in pH_{KCL}) between 8.4–9.5, indicating slightly basic sediments with no evidence of actual acidity (Table 3.8). S_{Cr} values were above the DER (2015a) Action Criteria of 0.06% (Table 3.8) in all sediment samples except MB4, MB6, AP1 and AP3, suggesting presence of potential ASS (PASS). The calculated ABA resulted in negative net acidity (mol H^+/tonne) for all sediment samples indicating PASS were buffered by the ANC of the sediments and the alkalinity of surrounding seawater (Table 3.8). Acid volatile sulfur (AVS) values ranged from below LoR (<0.002%) at site EQ3 and AP1 to 0.042% at site MB5, with four sites exceeding the AVS 0.01% trigger (Table 3.8). The presence of multiple MBOs indicators across all Landing Sites indicate sediments potentially contain MBOs (Table 3.8).

Full laboratory reports are provided in Annex B.

Table 3.8 Acid sulfate soils analysis and acid base accounting of sediments samples from the Swan River Ferry Expansion Landing Sites

Sampling area[1]	Sampling site[1]	pH_{KCL}[2]	S_{Cr} (%S)[2]	Potential sulfidic acidity (mol H^+/tonne)	ANC_{BT} (%$CaCO_3$)[2]	ANC (mol H^+/tonne)[2]	Net acidity (mol H^+/tonne)	AVS[2] (%)
Action Criteria[3]		–	0.06	–	–	–	–	–
AVS content trigger[4]		–	–	–	–	–	–	0.01
Elizabeth Quay Landing Site	EQ1	8.4	0.40	250	14.00	2800	-1700.00	0.023
	EQ2[T]	9.1	0.10	64	24.00	4834	-3180.00	0.003
	EQ3	8.9	0.14	85	15.00	3000	-1943.33	<0.002
Matilda Bay Landing Site	MB4	9.5	0.03	17	3.20	640	-415.33	0.004
	MB5	8.2	0.57	350	2.80	560	-140.00	0.042
	MB6	9.3	0.05	30	1.70	340	-206.67	0.017
Applecross Landing Site	AP1	9.5	0.02	14	2.70	540	-350.67	<0.002
	AP2	8.4	1.00	650	21.00	4200	-2366.67	0.003
	AP3	9.4	0.06	37	3.50	700	-442.00	0.017

Notes:

1. Refer to Table 2.1 and Figure 2.1 for explanation of sampling areas and sites.
2. 'pH_{KCL}' = pH in potassium chloride suspension; S = sulfur, SCr = chromium reducible sulfur; 'ANC_{BT}' = acid neutralising capacity by back titration; 'ANC' = acid neutralising capacity; 'AVS' = acid volatile sulfur; and '–' = no guideline value available; 'T' = triplicate QA/QC sample
3. Samples were assigned DER (2015a) action criteria for medium texture (sandy loams to light clays) and 1–1000 tonnes disturbance level.
4. Assessment of AVS content was based on the National Acid Sulfate Guidance (Sullivan et. al., 2018) trigger value of 0.01%.
5. T= triplicate and results were averaged to provide a single concentration for site EQ2.
6. **Red text** indicates exceedance of DER (2015a) action criteria or Sullivan et. al., (2018) MBO indicator.

Table 3.9 Assessment of criteria for presence of mono-sulfidic black ooze indicators in sediment samples from the Swan River Ferry Expansion Landing Sites

Sampling area[1]	Sediment site[1]	Criteria for assessment[2]				
		Distinct black/dark grey colour, gel-like consistency and/or oily appearance	Distinct "rotten egg" odour	Organic matter >5%	Moisture content >60% by weight	AVS => 0.01%
Elizabeth Quay Landing Site	EQ1	Yes	No	No	No	Yes
	EQ2[T]	Yes	No	No	No	No
	EQ3	Yes	No	No	No	No
Matilda Bay Landing Site	MB4	Yes	No	Yes	No	No
	MB5	Yes	No	No	Yes	Yes
	MB6	Yes	No	Yes	No	Yes
Applecross Landing Site	AP1	Yes	No	No	No	No
	AP2	Yes	No	No	No	No
	AP3	Yes	No	Yes	No	Yes

Notes:

1. Refer to Table 2.1 and Figure 2.1 for explanation of sampling areas and sites.
2. Criteria developed from DEC (2010), DER (2015a, b), Simpson et. al., (2018), and Sullivan et. al., (2018).
3. Refer to Table 3.9 for results of sediment sample moisture content.
4. **Red** text indicates exceedance of DEC (2010), DER (2015a, b), Simpson et. al., (2018), and Sullivan et. al., (2018) criteria.

3.6 Asbestos

Asbestos was not detected in any sediment samples from the Landing Sites. Full laboratory reports are provided in Annex B.

3.7 Organotins

Concentrations of MBT and TBT were below LoR in all sediment samples from Landing Sites (Table 3.10) and met the ANZG DGVs (ANZG 2018), where applicable. Dibutyltin (DBT) was detected at site MB5, all other sites were below laboratory LoR (<5 µg/kg; (Table 3.10).

Full laboratory reports are provided in Annex B.

Table 3.10 Organotin concentrations in sediment samples from the Swan River Ferry Expansion Landing Sites

Sampling area[1]	Sediment site[1]	Organotins (µgSn/kg)			
		MBT[6]	DBT	TBT[6]	Normalised DBT
ANZG DGV[2]		–	–	9	–
Elizabeth Quay Landing Site	EQ1	<100	<5	<5	<5
	EQ2[T]	<100	<5	<5	<5

Sampling area[1]	Sediment site[1]	Organotins (µgSn/kg)			
		MBT[6]	DBT	TBT[6]	Normalised DBT
ANZG DGV[2]		–	–	9	–
	EQ3	<100	<5	<5	<5
Matilda Bay Landing Site	MB4	<100	<5	<5	<5
	MB5	<100	9.5	<5	0.26
	MB6	<100	<5	<5	<5
Applecross Landing Site	AP1	<100	<5	<5	<5
	AP2	<100	<5	<5	<5
	AP3	<100	<5	<5	<5

Notes:

1. Refer to Figure 2.1 for locations of sampling areas and sites.
2. Australian and New Zealand Guidelines for Marine and Freshwater Quality Default Guideline Values (ANZG 2018)
3. MBT = monobutyltin; DBT = dibutyltin; TBT = tributyltin.
4. T=Triplicate sample and results have been averaged to provide a single concentration for site EQ2.
5. Concentrations below LoR were not normalised

3.7.2 Elutriate organotins

Concentrations of elutriate MBT, DBT and TBT were below laboratory LoRs in all sediment samples from the Landing Sites (Table 3.11). The lowest laboratory LoR achieved for TBT (0.01 µg/L) was higher than the 99% species protection limit DGV (0.0004 µg/L; ANZG 2018; (Table 3.11)).

Full laboratory reports are provided in Annex B.

Table 3.11 Elutriate organotin concentrations in sediment samples from the Swan River Ferry Expansion Landing Sites

Sampling area[1]	Sediment site[1]	Elutriate Organotins (µg/L)		
		MBT	DBT	TBT
ANZG DGV for 99% species level protection[2]		–	–	0.0004
Elizabeth Quay Landing Site	EQ1	<0.050	<0.010	<0.010
	EQ2[T]	<0.050	<0.010	<0.010
	EQ3	<0.050	<0.010	<0.010
Matilda Bay Landing Site	MB4	<0.050	<0.010	<0.010
	MB5	<0.050	<0.010	<0.010
	MB6	<0.050	<0.010	<0.010
Applecross Landing Site	AP1	<0.050	<0.010	<0.010
	AP2	<0.050	<0.010	<0.010
	AP3	<0.050	<0.010	<0.010

Notes:

1. Refer to Figure 2.1 for locations of sampling areas and sites.
2. Australian and New Zealand Guidelines for Marine and Freshwater Quality Default Guideline Value for 99% species protection level applicable to bioaccumulating toxicants (ANZG 2018)
3. MBT = monobutyltin; DBT = dibutyltin; TBT = tributyltin.
4. T=Triplicate sample and results have been averaged to provide a single concentration for site EQ2.

3.8 Hydrocarbons

3.8.1 Polycyclic aromatic hydrocarbons

Polycyclic aromatic hydrocarbons (PAHs) were detected in all sediment samples from the Landing Sites. Normalised total PAH concentrations ranged from 0.0–2.2 mg/kg, which was lower than the ANZG DGV (10 mg/kg; ANZG 2018). Total PAHs were highest at site EQ1 (2.2 mg/kg) and lowest at site AP1 and AP3 (0.0 mg/kg; Table 3.12).

Table 3.12 Polycyclic aromatic hydrocarbon concentrations in sediment samples from the Swan River Ferry Expansion Landing Sites

Sampling Area[1]	Sampling Site[1]	Total PAHs[6] (mg/kg)	Normalised total PAHs[6] (mg/kg)
ANZG DGV[2]		–	10
Elizabeth Quay Landing Site	EQ1	3.9	1.6
	EQ2[T]	1.2	2.2
	EQ3	1.4	1.6
Matilda Bay Landing Site	MB4	0.0	0.1
	MB5	1.8	0.5
	MB6	0.0	0.2
Applecross Landing Site	AP1	0.0	0.0
	AP2	0.3	0.1
	AP3	0.0	0.0

Notes:

1. Refer to Figure 2.1 for locations of sampling areas and sites.
2. Australian and New Zealand Guidelines for Marine and Freshwater Quality Default Guideline Values (ANZG 2018)
3. PAH= polycyclic aromatic hydrocarbons.
4. T=Triplicate sample and results have been averaged to provide a single concentration for site EQ2.
5. Total PAH comprises sum of naphthalene, acenaphthalene, acenaphthene, phenanthrene, fluorene, anthracene, chrysene, pyrene, fluoranthene, benz(b)fluoranthene, benz(k)fluoranthene, benzo(a)pyrene, indeno[1,2,3-c,d]pyrene, dibenz[a,h]anthracene, perylene, benzo(e)pyrene, 2 methylnapthalene, coronene.

3.8.2 Total recoverable hydrocarbons

Concentrations of TRHs were generally below LoR, except for several detections of fractions >C10–C16, >C16–C34, >C34–C40. No ANZG DGV (ANZG 2018) guidelines exist for TRHs.

Full laboratory reports are provided in Annex B.

3.8.3 Total petroleum hydrocarbons

Concentrations of TPHs were below LoR in sediment samples from the Landing Sites, except for one detection of fraction of C15–C28 (EQ1), and three detections of fraction C29–C36 (EQ1, EQ3 and MB5). Total normalised TPH concentrations in all sediment samples were below the ANZG DGV (ANZG 2018; Table 3.13).

Full laboratory reports are provided in Annex B.

Table 3.13 Total petroleum hydrocarbons concentrations in sediment samples from the Swan River Ferry Expansion Landing Sites

Sampling Area[1]	Sampling Site[1]	Total TPHs (mg/kg)	Normalised total TPHs (mg/kg)
ANZG DGV (mg/kg)[2]		–	280
Elizabeth Quay Landing Site	EQ1	127	53
	EQ2[T]	<25	<25
	EQ3	39	44
Matilda Bay Landing Site	MB4	<25	<25
	MB5	46	13
	MB6	<25	<25
Applecross Landing Site	AP1	<25	<25
	AP2	<25	<25
	AP3	<25	<25

Notes:

1. Refer to Figure 2.1 for locations of sampling areas and sites.
2. Australian and New Zealand Guidelines for Marine and Freshwater Quality Default Guideline Values (ANZG 2018)
3. PAH= polycyclic aromatic hydrocarbons.
4. T=Triplicate sample and results have been averaged to provide a single concentration for site EQ2.

3.8.4 Benzene, toluene, ethylbenzene and xylene

Concentrations of BTEX were below LoR in all sediment samples from the Landing Sites.

Full laboratory reports are provided in Annex B.

3.9 Organochlorine pesticides

Concentrations of OCPs were below LoR in all sediment samples from the Landing Sites. The laboratory LoRs of several OCP analytes had to be raised due to the sample matrix requiring dilution resulting in LoRs exceeding ANZG DGVs, where applicable.

Full laboratory reports are provided in Annex B.

3.10 Antifoulants

Concentrations of antifoulants were below LoR in all sediment samples from the Landing Sites.

Full laboratory reports are provided in Annex B.

3.11 Polychlorinated biphenyls

Concentrations of total PCBs were below LoR in all sediment samples from the Landing Sites.

Full laboratory reports are provided in Annex B.

3.12 Per- and polyfluoroalkyl substances

PFAS were detected in all sediment samples from the Landing Sites. Only those PFAS species with concentrations detected above LoR are reported (Table 3.14; Annex B). There are presently no PFAS marine sediment quality guidelines; however, the HEPA (2025) soil EGVs and HHILs were compared to normalised PFAS concentrations in marine sediment samples from the Landing Sites for contextual purposes only (HEPA 2025; Table 3.14). No sediment samples from the Landing Sites exceeded the EGVs or HHILs (HEPA 2025; Table 3.14).

Full laboratory reports are provided in Annex B.

Table 3.14 Per- and polyfluoroalkyl substances concentrations in sediment samples from the Swan River Ferry Expansion Landing Sites

Sampling Area[1]	Sample Site[1]	PFAS Species (mgkg)									
		PFOS	PFOA	PFHxS	PFOS + PFHxS	PFAS (total)	Normalised PFOS	Normalised PFOA	Normalised PFHxS	Normalised PFOS + PFHxS	Normalised PFAS (total)
PFAS NEMP Soil Ecological Guideline (mg/kg)[2]		–	–	–	–	–	1	10	–	–	–
PFAS NEMP Soil Human Health Investigation Level (mg/kg)[3]		–	–	–	–	–	–	10	–	1	–
Elizabeth Quay Landing Site	EQ1	0.0015	<0.0002	<0.0002	0.002	0.002	0.001	<0.0002	<0.0002	0.001	0.001
	EQ2[T]	0.0005	<0.0001	<0.0001	0.000	0.000	0.001	<0.0001	<0.0001	0.001	0.001
	EQ3	0.0009	<0.0001	<0.0001	0.001	0.001	0.001	<0.0001	<0.0001	0.001	0.001
Matilda Bay Landing Site	MB4	0.0004	0.00015	0.0004	0.001	0.001	0.002	0.0008	0.0020	0.004	0.005
	MB5	0.0023	<0.0003	<0.0003	0.002	0.002	0.001	<0.0003	<0.0003	0.001	0.001
	MB6	0.0030	0.0007	0.0018	0.005	0.005	0.013	0.0030	0.0078	0.021	0.024
Applecross Landing Site	AP1	0.0007	0.00022	<0.0001	0.001	0.001	0.003	0.0011	<0.0001	0.003	0.004
	AP2	0.0006	<0.0003	<0.0003	0.001	0.001	0.000	<0.0003	<0.0003	0.000	0.000
	AP3	0.0003	0.0002	0.0003	0.001	0.001	0.002	0.00095	0.0020	0.003	0.004

Notes:

1. **Refer to Table 2.1 and Figure 2.1 for explanation of sampling areas and sites.**
2. **Refers to the Ecological direct exposure – all land uses soil guideline (HEPA 2025).**
3. **Refers to the Public Open Space Human Health Investigation Level (HIL C; HEPA 2025).**
4. **"PFAS (total)" = per- and polyfluoroalkyl substances, "PFOA" = perfluorooctanoic acid, "PFOS" = perfluorooctane sulfonic acid, "PFHxS" = perfluorohexane sulfonic acid.**
5. **T=Triplicate sample and results have been averaged to provide a single concentration for site EQ2.**

3.12.2 Elutriate per- and polyfluoroalkyl substances

Elutriate PFOS concentrations exceeded the PFAS NEMP Guideline (HEPA 2025) in all sediment samples from the Landing Sites, ranging 0.0089–0.044 µg/L (Table 3.15). There were no exceedances of the PFOA guideline (Table 3.15).

Full laboratory reports are provided in Annex B.

Table 3.15 Elutriate per- and polyfluoroalkyl substances concentrations in sediment samples from the Swan River Ferry Expansion Landing Sites

Sampling Area[1]	Sample Site[1]	PFOS	PFOA
PFAS NEMP Guideline (µg/L)[3]		0.00023	19
Elizabeth Quay Landing Site	EQ1	0.015	0.0036
	EQ2[T]	0.013	0.0030
	EQ3	0.014	0.0035
Matilda Bay Landing Site	MB4	0.027	0.016
	MB5	0.015	0.0032
	MB6	0.030	0.020
Applecross Landing Site	AP1	0.044	0.017
	AP2	0.0089	0.0027
	AP3	0.017	0.012

Notes:

1. Refer to Figure 2.1 for locations of sampling areas and sites.
2. T=Triplicate sample and results have been averaged to provide a single concentration for site EQ2.
3. Refers to the Interim Marine Water 99% species protection for bioaccumulating toxicants– high conservation value systems guideline (HEPA 2025).
4. PFAS" = per- and polyfluoroalkyl and substances, "PFOA" = perfluorooctanoic acid, "PFOS" = perfluorooctane sulfonic acid
5. Red text indicates exceedance of PFAS NEMP guidelines (HEPA 2025)

3.13 QA/QC results

Results of the RSD assessment for triplicate site EQ2 showed several exceedances of the acceptable RSD limit (50%; Section 2.3.6). Lead, mercury, phenanthrene, anthracene, fluoranthene, and benzo(a)anthracene exceeded the RSD ±50% limit (Table 3.1). The exceedances suggest small-scale spatial heterogeneity within site EQ2 for these analytes. Analytes with concentrations below the laboratory LoR were excluded from the calculation of RSD (Section 2.3.6).

PSD data showed large variation in sediment size composition across triplicate samples and associated potential heterogeneity that may lead to variability in sample analyte concentrations (Figure 3.1).

The trip blank (inert sediment) recorded analyte concentrations below LoR for all analytes except chromium (1 mg/kg), aluminium (270 mg/kg), barium (0.87 mg/kg), iron (66 mg/kg), lead (0.84 mg/kg) and manganese (0.89 mg/kg). These results suggest potential cross contamination in the field and during transit of samples. These metal concentrations are low-level concentrations comparatively to Landing Sites sample concentrations and were below relevant guidelines, where available (Table 3.5), and therefore it can be assumed there was minimal influence on samples as a result of contamination during transport. Alternatively, analyte concentrations above LoR reported in the inert sediment triplicate blank

may be due to interference at the laboratory during preparation and supply of the inert sample as clean, rather than due to contamination during transport.

The rinsate recorded analyte concentrations below LoR for all analytes except TRH C15–C28 (160 µg/L), TRH >C10–C16 (99 µg/L) and zinc (2 µg/L). These results suggest minor cross contamination of hydrocarbons and zinc during the equipment rinsing/sampling process or residue concentration remaining on equipment following site decontamination.

QA/QC laboratory results are provided in Annex B.

Table 3.1 Quality assurance and quality control results of sediment samples from the Swan River Ferry Expansion Landing Sites

QA/QC sample type		Field Triplicate
Test statistic[1]		RSD (%)
Sampling site[2]		EQ2
Analyte type	Analyte[4]	1,2,3
Total metals	Aluminium	24.6
	Arsenic	9.0
	Barium	15.6
	Boron	7.5
	Total chromium	8.2
	Cobalt	17.4
	Copper	3.1
	Iron	17.6
	Lead	136.0
	Manganese	12.6
	Mercury	56.9
	Molybdenum	25.5
	Nickel	20.8
	Vanadium	13.6
	Zinc	9.1
Polycyclic aromatic hydrocarbons	Acenaphthylene	9.1
	Phenanthrene	124.7
	Anthracene	95.0
	Fluoranthene	51.2
	Pyrene	35.9
	Benzo(a)anthracene	51.1
	Chrysene	46.2

QA/QC sample type		Field Triplicate
Test statistic[1]		RSD (%)
Sampling site[2]		EQ2
Analyte type	Analyte[4]	1,2,3
	Benzo(a)pyrene	18.9
	Perylene	22.3
	Benzo(e)pyrene	17.5
Elutriate nutrients	Total phosphorus	23.2
	Filterable reactive phosphorus	21.6
	Total nitrogen	14.6
	Ammonium	20.5
	Ammonia	20.5
	Total kjedhal nitrogen	14.7

Notes:

1. **Test statistics calculated as per methods described in Section 2.3.6.**
2. **Refer to Table 2.1 and Figure 2.1 for explanation of sampling areas and sites.**
3. **Analytes not included reported concentrations below LoR.**
4. **Numbers in red indicate an exceedance of the acceptable RSD limits (Section 2.3.6).**
5. **RSD was calculated for the triplicate sample (EQ2) only as other QA/QC samples are part of the broader campaign**

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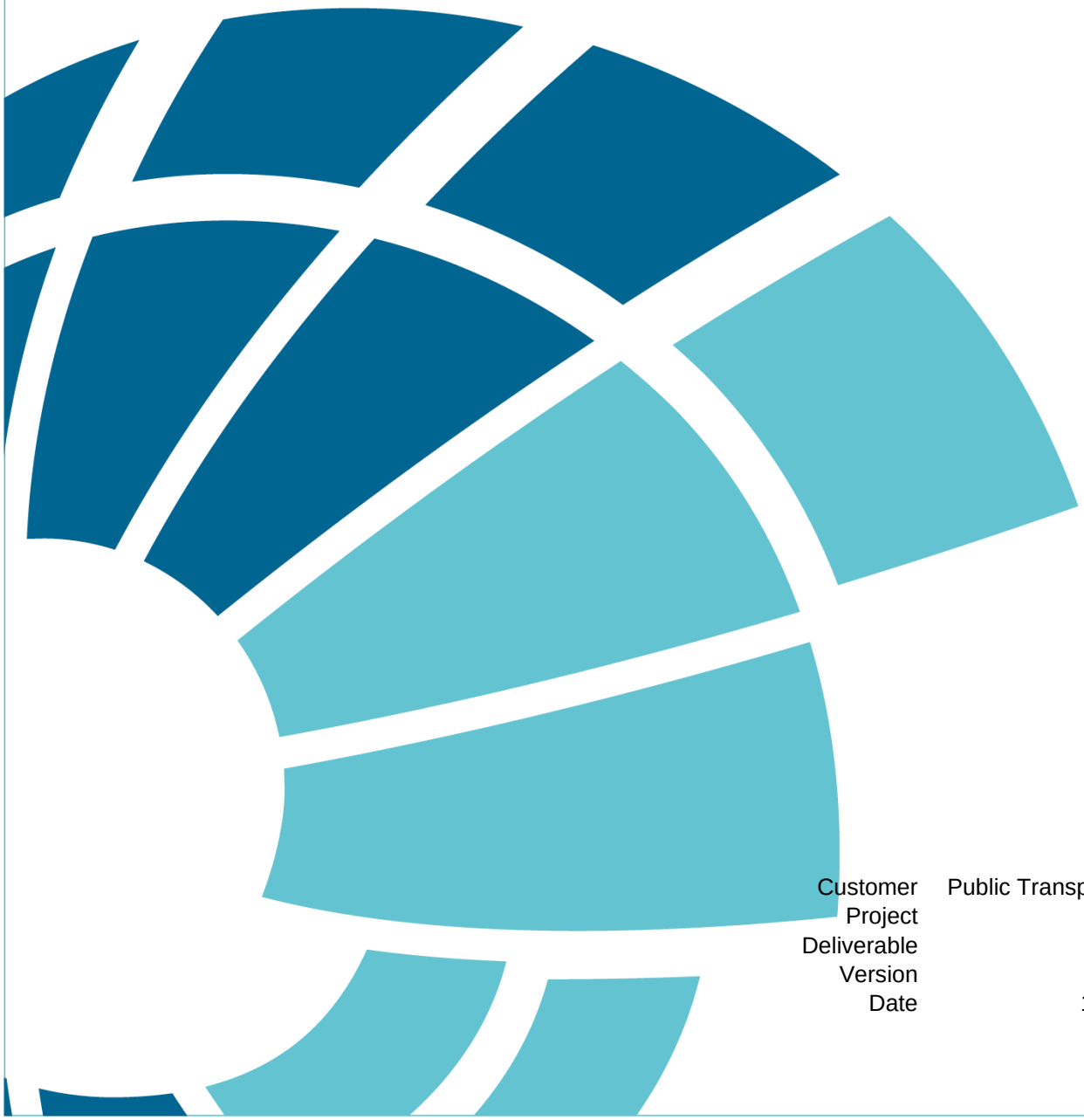
Annex A Public Transport Authority Ferry Expansion Sampling and Analysis Plan

Public Transport Authority Ferry Expansion – Sampling and Analysis Plan



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Acronyms and measurement units

Acronyms	Description
ACH	Aboriginal Cultural Heritage
ACHIS	Aboriginal Cultural Heritage Inquiry System
ACM	Asbestos containing material
AH Act	*Aboriginal Heritage Act 1972*
ANZG	Australia and New Zealand Marine and Freshwater Guidelines
ASLP	Australian Standard Leaching Procedures
ASS	Acid sulfate soils
AVS	Acid volatile sulfide
BCH	Benthic communities and habitat
BTEX	Benzene, toluene, ethylbenzene and xylene
CBD	Central business district
CD	Chart datum
CEC	Cation exchange capacity
CL	Concentration limits
CoC	Chain of custody
COPC	Contaminants of potential concern
CS Act	*Contaminated Sites Act 2003*
CSD	Cutter-suction dredge
DBCA	Western Australia Department of Biodiversity, Conservation and Attractions
DCA	Development Control Area
DDE	Dichlorodiphenyldichloroethylene
DEIA	Dredging Environmental Impact Assessment
DGV	Default guideline value
DPLH	Western Australian Department of Planning, Lands and Heritage
DWER	Western Australian Department of Water and Environmental Regulation
EILs	Ecological Investigation Levels
EQS	Environmental quality standard
ESLs	Ecological Screening Levels
FWG	Freshwater Guidelines
GPS	Global positioning system

Acronyms	Description
HDPE	High density polyethylene
HILs	Health Investigation Levels
JHA	Job Hazard Analysis
LoR	Limit of reporting
MEPG	Marine Ecosystem Protection Guidelines
NAGD	National Assessment Guidelines for Dredging
NATA	National Association of Testing Authorities
NEPM	National Environmental Protection Measures
NEMP	National Environmental Management Plan
OCPs	Organochlorine pesticides
PAH	Polycyclic aromatic hydrocarbons
PCBs	Polychlorinated biphenyls
PFAS	Per- and poly-fluorinated alkyl substances
PFHxS	Perfluorohexane sulfonate
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctane sulfonate
PSD	Particle size distribution
PTA	Western Australian Public Transport Authority
QA/QC	Quality assurance/quality control
SAP	Sampling Analysis Plan
SCR	Swan Canning Riverpark
TBT	Tributyltin
TOC	Total organic carbon
TPH	Total petroleum hydrocarbon
TRH	Total recoverable hydrocarbon
WA	Western Australia
Measurement units	**Description**
cm	Centimetre
km	Kilometre
m	Metre
m^3	Cubic metre

1 Introduction

1.1 Background

The Public Transport Authority (PTA) proposes to expand the public ferry service network in metropolitan Perth, Western Australia (WA). The proposed first stage of the expansion involves linking the existing ferry route between Elizabeth Quay and South Perth, downstream to Matilda Bay and Applecross Figure 1.1). Future stages of the project will include a berthing facility at Ellam Street and a terminal at Canning Bridge.

The Swan Canning Estuary is downstream of the Swan and Canning Rivers and is a salt-wedge urban estuary which receives ocean flushing from the Indian Ocean and river flow from the Avon and Swan coastal catchments (Kilminster 2010). These catchments contain urban, agricultural and industrial land uses.

The proposed ferry routes are in the Swan Canning Riverpark (SCR) managed by Department of Biodiversity, Conservation and Attractions (DBCA). The SCR supports commercial and tourism activities, as well as diverse ecosystems. To achieve the depth of navigational channels required for the proposed expansion within the SCR, capital dredging, and maintenance dredging of the existing channel, is required.

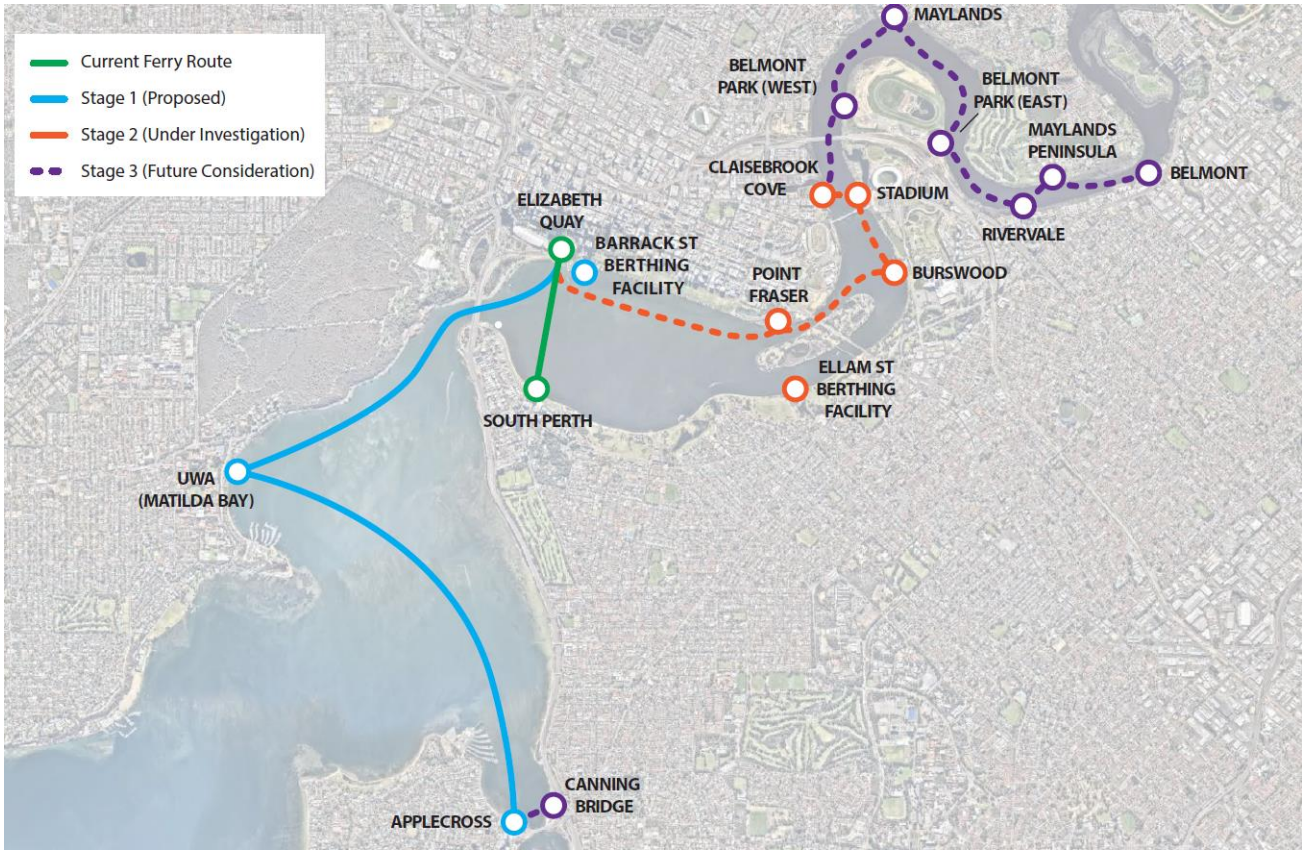

Figure 1.1 Proposed Public Transport Authority ferry network expansion

1.2 Purpose of this document

Sediment sampling is required to characterise the physical and chemical parameters of the material proposed to be dredged. Sediment sampling will be completed as part of feasibility investigations for Stage 1 of the project (Figure 1.1). Further sediment sampling may be required as the project design and methods progress. This document presents a Sampling and Analysis Plan (SAP) that describes sampling methods and analyses for characterisation of the sediments within the areas applicable to the proposed dredging campaign, in-line with the relevant sampling guidelines outlined below:

- the National Assessment Guidelines for Dredging (NAGD; CA 2009) that provides a reasonable and logical framework for the sampling of sediments to adequately characterise the physical and contamination status of the dredged material
- the Contaminated Sites Guidelines (DWER 2021) for high level screening assessment of dredge sediment for onshore disposal, and;
- the WA Landfill Waste Classification and Waste Definitions 1996 (DWER 2019) that provides a framework for the acceptance of material to landfill.

All frameworks provide guidance on sampling design, sampling methods, quality assurance and quality control (QA/QC), and sample handling, storage and transport.

This SAP also provides:

- a description of the proposed dredging campaign and the relevant legislation and guidelines (Section 2.1)
- a review of existing information on sediment characteristics within the dredging area, and potential sources of contamination (Section 2.3)
- an outline of the proposed sampling program with information on the number, type and location of samples required to adequately characterise the sediments for dredging (Section 3.1)
- the proposed quality assurance and quality control (QA/QC) procedures (Section 3.1.2)
- the proposed methods for sampling, sample preservation, transportation and storage to ensure the integrity of the samples (Section 3.2)
- an outline of the proposed benthic communities and habitats (BCH) field data collection and mapping scope (Section 3.2.7)

Sediment sampling results will be reported in a SAP Implementation Report, which will be used to inform a Dredging Environmental Impact Assessment (DEIA).

2 Project Description

2.1 Dredging

PTA propose to expand the existing channel developed for the ferry route in the SCR, in an area parallel to the Peth metropolitan Central Business District (CBD), extending southeast to the Ellam Street Berthing Facility (hereafter; Dredge Area; Figure 2.1). The Dredge Area is proposed to be a design depth of -1.5 m Chart Datum (CD) to be achieved with a cutter-suction dredge (CSD) or similar equipment. The volume of the campaign is anticipated to be ~63,000 m^3 to design depth, with an assumed uniform overdredge tolerance of 0.3 m equating to a maximum volume of ~113,000 m^3 of material.

It is anticipated some areas within the proposed Dredge Area (Figure 2.1) may contain elevated concentrations of contaminants and these sediments may require disposal to landfill or other terrestrial receiving environments. Disposal specifications will be informed based on the results of sediment sampling and as the project design progresses.

Six potential ferry landing sites have been identified downstream of the proposed Dredge Area; Elizabeth Quay, Barrack Street, Matilda Bay 1, Matilda Bay 2, Canning Bridge and Applecross (hereafter; Landing Sites; Figure 2.1). The proposed method for construction/installation of the Landing Sites is pile-driving and floating pontoons. Investigative surface samples of these areas will be collected to gain an understanding of sediments to inform characteristics from small-scale sediment disturbances during construction and operations. Given the proximity of Barrack Street to both Elizabeth Quay and the Dredge Area, sediment sampling is not proposed at this Landing Site. Barrack Street will be assessed for BCH only, as outlined in Section 3.2.7.

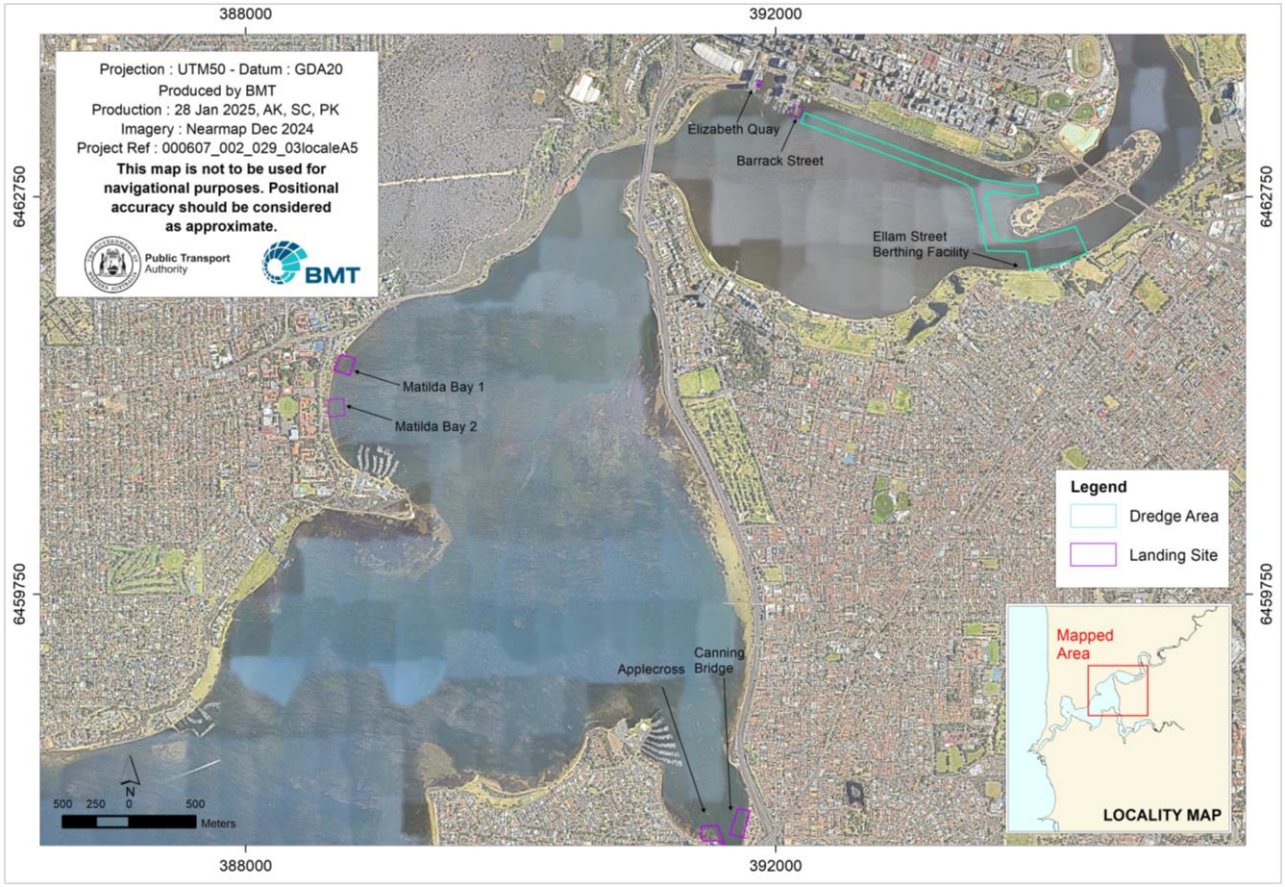

Figure 2.1 Proposed locations of Public Transport Authority's Dredge Area and Landing Sites

2.2 Relevant legislation and guidance

The environmental legislation and guidelines applicable to the SAP for the proposed dredging campaign are outlined below and detailed in Annex A:

- *Environmental Protection Act 1986*
- National Assessment Guidelines for Dredging (CA 2009)
- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG 2018)
- *Contaminated Sites Act 2003* (CS Act) and Contaminated Sites Guidelines (DWER 2021)
- Landfill Waste Classification and Waste Definitions 1996 (as amended 2019) (DWER 2019)
- *Swan and Canning Rivers Management Act 2006* and Swan and Canning Rivers Management Regulations 2007
- *Waste Avoidance and Resource Recovery Act 2007*
- PFAS National Environmental Management Plan 3.0 (HEPA 2025)
- Acid Sulfate Soils Guidelines (DER 2015)
- National Acid Sulfate Soils Guidance (Simpson et. al. 2018)
- *Aboriginal Heritage Act 1972* (AH Act)

2.3 Sediment data and potential contamination sources review

The main sources of potential contamination within the Dredge Area and Landing Sites are likely to be associated with:

- Commercial and recreational vessel activities from transit, berthing and mooring
- Runoff from agricultural and industrial activities upstream in the Swan and Canning Rivers
- Historical unregulated landfill within the vicinity of the Dredge Area and Landing Sites
- Historical land uses in the vicinity of the Dredge Area and Landing Sites.

2.3.1 Contaminated sites database

Dredge Area

Review of DWER's Contaminated Sites database showed the Dredge Area is within the vicinity (<1 km) of contaminated sites associated with Elizabeth Quay (DWER 2024a). Elizabeth Quay was utilised as a landfill area during the 1960s and 1970s and was reported as contaminated under Section 11 of the CS Act. These sites are listed as "remediated for restricted use" and are subject to implementation of an Ongoing Site Management Plan for future ground disturbance works (DWER 2024a). Soil and groundwater quality sampling conducted in Elizabeth Quay in 2010 and 2014 reported polycyclic aromatic hydrocarbons (PAHs) concentrations exceeding relevant NEPC (2013) Ecological Screening Levels (ESLs) and Health Investigation Levels (HILs) (DWER 2024a; NEPC 2013).

Lot 502 (Trinity College) in East Perth is a contaminated site within 1 km of the Dredge Area and listed as "remediated for restricted use" (DWER 2024a). Historical uncontrolled fill material was disposed to the area as part of land reclamation works in the 1950s and 1960s, which contained elevated concentrations of metals, hydrocarbons and fragments of asbestos containing material (ACM). Environmental sampling completed in 2004 and 2006 reported lead and PAHs concentrations in soils exceeded relevant NEPC (2013) HILs (DWER 2024a). Metals (Zinc, chromium, lead, nickel, copper), organochlorine pesticides (OCPs) and hydrocarbons in surface soils exceeded relevant NEPC (2013) Ecological Investigation Levels (EILs).

Landing Sites

The Canning Bridge, Applecross and both Matilda Bay Landing Sites are within the vicinity (<1 km) of sites "remediated for restricted use" from historical land use operations (DWER 2024a). The Canning Bridge and Applecross Landing Sites are associated with elevated concentrations of hydrocarbons and lead in groundwater and soil from historical service stations on the site (DWER 2024a). The Matilda Bay Landing Sites are within the vicinity of a site associated with ACM in soil from historical structures used as military barracks (DWER 2024a).

2.3.2 Acid sulfate soils database

Review of DWER's acid sulfate soil (ASS) risk map showed the Dredge Area and Landing Sites are located within a high to moderate ASS risk area (DWER 2024b). The entire Swan Canning Estuary is classified as such, indicating there is a risk to disturbing actual ASS material <3 m from the surface. Monosulfidic black oozes (MBOs) are materials found in sediments which contain high monosulfide concentrations which affect the physical properties and behaviours of sediments (Sullivan et al. 2018). In sediments, an acid volatile sulfide (AVS) greater than or equal to 0.01% is sufficient for the material to be classified as monosulfidic (Sullivan et al. 2018). The formation of MBOs is common in ASS affected drainage channels and areas with low flushing, and there is a potential risk of MBOs in upper parts of the Swan Canning Estuary.

2.3.3 Previous sampling of the Dredge Area

Sediment sampling

The Swan Canning Estuary has been subject to increased developments and environmental monitoring over recent years. Available relevant contaminant data in the vicinity of the Dredge Area is summarised below.

Regional sediment sampling was completed in 2007 at 20 sites throughout the Swan Canning Estuary to provide an understanding of environmental quality and potential sediment contaminants within surficial sediments (top 3 cm) (DoW 2009). Sites sampled located in close proximity (<1 km) to the Dredge Area were adjacent to the CBD (south of Elizabeth Quay) and Burswood (northeast of Heirisson Island). At the CBD site, zinc and lead concentrations in sediments exceeded the relevant Environmental Quality Standard (EQS; EPA 2005) for high protection (DoW 2009). At the Burswood site, zinc, lead and dieldrin sediment concentrations exceeded the relevant EQS for high protection (DoW 2009). Overall, the sampling program showed sites downstream in the middle portion of the Swan River (ie. CBD and Burswood) had higher PAHs concentrations compared to the lower and upper reaches of the Swan River; however, no guidelines were exceeded (DoW 2009).

Sediment sampling was completed in 2015 at the same 20 sites sampled in DoW (2009) to monitor temporal variability in sediment contaminants (DBCA 2022a). In addition to the surficial samples, the 3–10 cm horizon was sampled. ANZG (2018) default guideline values (DGVs) were exceeded for five contaminants in sediments; zinc, copper, lead, dichlorodiphenyldichloroethylene (DDE; a common OCP) and PCBs (DBCA 2022a). GV-High was exceeded for zinc only (DBCA 2022a). There were exceedances of contaminants at both surficial and the 3–10 cm horizon, with no significant patterns of exceedances across depths.

Sediment sampling was completed for the construction of the Matagarup Bridge in 2013, located upstream of the Dredge Area near Optus Stadium (RPS 2013). Sampling detected exceedances of Interim Sediment Quality Guidelines-Low (ISQGs; DEC 2010) in metals, PAHs and OCPs generally in the top 1 m of sediments (RPS 2013). ACM and potential ASS material was also detected in several sediment samples (RPS 2013). Cyanides were detected above the limit of reporting (LoR) in several samples, with no relevant guidelines applicable. Elutriate analysis of sediments showed zinc and boron concentrations exceeded Freshwater Guidelines (FWG; RPS 2013).

Sediment sampling was completed in 2021 and 2022 for the construction of the Boorloo Bridge (Causeway Pedestrian and Cyclist Bridge) spanning across Heirisson Island and located ~500 m northeast of the Dredge Area. Metals, OCPs and PAHs exceeded ANZG (2018) DGV (total; AECOM 2023). Potential ASS material was confirmed in several sediment samples (AECOM 2023).

Water quality sampling

Water sampling completed for the construction of the Matagarup Bridge showed Marine Ecosystem Protection Guidelines (MEPG) were exceeded for copper, and FWG were exceeded for zinc (RPS 2013). Total nitrogen, ammonia, total phosphorus and reactive phosphorus exceeded MEPGs (RPS 2013) in all samples, and FWGs were exceeded in several water samples (RPS 2013).

Water sampling completed as part of the construction of the Boorloo Bridge exceeded HEPA (2020) per- and poly-fluoroalkyl substances (PFAS) guidelines in surface water samples (AECOM 2023). Currently only environmental guidelines for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) are available for marine and freshwater (HEPA 2020). PFOS concentrations exceeded the 99% level of species protection but were below the 95% level of species protection (HEPA 2020) in all samples (AECOM 2023).

DBCA conducted regional water sampling between 2016 and 2018 to assess PFAS concentrations in the Swan Canning Estuary and its catchment at 52 sites on four sample occasions (DBCA 2022b). PFAS were detected in surface waters at all 52 sites. PFOS exceeded the HEPA (2020) 99% level of species protection at all sites, except the most upstream site of the Swan Canning River on two sampling occasions. The major PFAS compounds detected were PFOS, perfluorohexane sulfonate (PFHxS) and PFOA (DBCA 2022b). Concentrations were highest in the middle Swan and Canning Estuary (where the Dredge Area lies), in particular surrounding Perth Airport drains (DBCA 2022b).

DBCA conducts routine water quality monitoring in the Swan Canning Estuary at surface and depth for key physical parameters including salinity, dissolved oxygen, chlorophyll-a and temperature. A microalgal activity report is produced based on chlorophyll-a concentrations (DBCA 2024). The upper reaches of the Swan and Canning Rivers are commonly listed as medium to high risk of microalgal activity, recorded as discolouration/scum formation. Routine monitoring in the middle part of the Swan Canning Estuary (where the Dredge Area is located) has shown chlorophyll-a concentrations are variable and range from low-high typically coinciding with seasonality (DBCA 2024).

2.3.4 Previous sampling of the Landing Sites

The CBD site sampled in DoW (2009) and DBCA (2022a) is within the proposed Elizabeth Quay Landing Site (Section 2.3.3) and recorded exceedances of zinc and lead concentrations in sediments (DoW 2009). Less developments and environmental monitoring programs have occurred over recent years at Matilda Bay, Applecross and Canning Bridge Landing Sites and therefore limited sampling data of the existing environment is available from these Landing Sites. The Matilda Bay site sampled in DoW (2009) and DBCA (2022a) is the most recent available sample data, located ~2 km southeast of Matilda Bay and ~2 km northwest of Applecross/Canning Bridge Landing Sites, and reported sediment contaminants below relevant guidelines.

2.3.5 Contaminants of potential concern

Following review of existing sediment quality data and contaminants of potential concern (COPC; Sections 2.3.1–2.3.4), sediments within the Dredge Area will be analysed for a range of COPC listed in Table 2.1 and further detailed in Section 4.1. COPC have been selected based on understanding of historical land use, results from sampling projects in the SCR, requirements of DWER (2019) and initial consultation with DBCA (S.Chan, pers. comm. 11 September 2024).

Table 2.1 Potential risk of sediment contamination within sediments from the Dredge Area

Contaminant of potential concern	Risk rating	Reasons for risk	Assessment required?
Metals	Medium	Potential sources from vessel operations, refuelling, antifoulant paints, marine structures and/or stormwater inputs. Previous sediment sampling showed elevated copper, lead and zinc concentrations at sites sampled in the vicinity of the Dredge Area (DoW 2009, DBCA 2022a). Metals exceeded ANZG (2018) DGV for high protection in sediments sampled for the nearby Matagarup and Boorloo Bridges (RPS 2013, AECOM 2023) Historical contaminated sites within the vicinity of the Dredge Area showed concentrations of zinc, chromium, lead, nickel and copper	Yes

Contaminant of potential concern	Risk rating	Reasons for risk	Assessment required?
		exceeded relevant NEPC (2013) EILs (DWER 2024a).	
Nutrients (leading to eutrophication and phytoplankton blooms)	High	The Dredge Area receives runoff from agricultural and industrial areas located upstream. Increased nutrient input and low flushing rates often causes harmful algal blooms in the middle Swan Canning Estuary. Eutrophication in the Dredge Area is considered high risk, given eutrophication in the broader Swan Canning system is common and the potential additive nutrient release during dredging requires assessment. Water sampling in RPS (2013) showed total nitrogen, total phosphorus, ammonia and reactive phosphorus exceeded FWG.	Yes
Hydrocarbons	Medium	Potential sources from vessel transiting, refuelling and commercial operations. The Dredge Area is located within the vicinity of historical contaminated sites containing high concentrations of PAHs in soils (DWER 2024a). High concentrations of PAHs found in sediments of the middle parts of the Swan Canning Estuary (DoW 2009) PAHs exceeded DGVs in previous nearby sediment sampling conducted for the Matagarup Bridge construction (RPS 2013)	Yes
Organotins	Medium	TBT as a vessel antifoulant was globally banned in 2008; however, remains a persistent environmental organic pollutant. Vessels frequently transit/moor near the Dredge Area and TBT was detected in sediment sampling conducted upstream for the Boorloo Bridge construction (AECOM 2023).	Yes
ASS and MBOs	High	Sediments classified as potential ASS material in RPS (2013) and AECOM (2023). Dredge Area is located in a high-moderate ASS risk area (DWER 2024b). Sediments have been classified as containing a high proportion of silts and clays in the vicinity of the Dredge Area (RPS 2013, AECOM 2023) and will be assessed for MBOs, given the risk of ASS and known formation of MBOs in estuarine systems.	Yes
PFAS	Medium	Environmental contamination from PFAS is an emerging issue. Given the high number of historical and current anthropogenic activities	Yes

Contaminant of potential concern	Risk rating	Reasons for risk	Assessment required?
		surrounding and upstream of the Dredge Area, there is a potential risk of PFAS. PFAS species were detected in sediments nearby to the Dredge Area in previous sampling competed for the Boorloo bridge (AECOM 2023) PFAS was detected in water quality sampling throughout the Swan Canning system including in the vicinity of the Dredge Area (DBCA 2022b)	
OCPs	Medium	The Dredge Area receives runoff from agricultural and industrial areas located upstream. OCPs were detected in previous sampling conducted for the Boorloo and Matagarup Bridges construction (RPS 2013, AECOM 2023). DDE exceeded the ANZG (2018) DGV for 99% level of species protection (DBCA 2022a).	Yes
PCBs	Medium	PCBs are known as persistent organic pollutants. PCBs in sediments exceeded the ANZG (2018) DGV for high protection in DBCA (2022a) Advised for analysis by DBCA during preliminary consultation (S.Chan, pers. comm. 11 September 2024)	Yes
Antifoulants	Low	Since the global ban on the use of TBT, there has been a transition to copper based antifoulants. Paints with copper often contain additional booster biocides such as zinc pyrithione, diuron, irgarol 1051 or organic algaecides; and contamination by these TBT-replacement compounds present a risk to sediment quality. Alternative antifoulant products have not previously been sampled in the vicinity of the Dredge Area. Advised for analysis by DBCA during initial consultation (S.Chan, pers. comm. 11 September 2024)	Yes
ACM	Medium	Detected in previous sediment sampling for Matagarup Bridge construction (RPS 2013)	Yes

Note:

1. **"ACM" = asbestos containing material, "ASS" = acid sulfate soils, "DGVs" = default guideline value, "DBCA" = Department of Biodiversity, Conservation and Attractions, "DDE" = dichlorodiphenyldichloroethylene ,"FWG" = freshwater guidelines, "EILs" = ecological investigation levels, "MBOs" = monosulfidic black oozes, "OCPs" = organochlorine pesticides, " "PAHs" = polycyclic aromatic hydrocarbons, "PCBs" = polychlorinated biphenyls, "PFAS" = per- and poly-fluorinated alkyl substances, "TBT" = tributyltin**

All Dredge Area samples will also be analysed for particle size distribution (PSD), total organic carbon (TOC), pH (in laboratory) and cation exchange capacity (CEC) to inform calculations of EILs, normalisation of organics and plume extent / dispersion.

Given existing data in the vicinity of the Landing Sites is limited (Section 2.3.4), a conservative approach for identification of COPC has been applied, with the suite of analytes at the Landing Sites reflecting the same COPC for the Dredge Area. The Matilda Bay and Applecross/Canning Bridge Landing Sites are situated further from potential sources of contamination (historical unregulated landfill, agricultural and industrial land uses) and are also further downstream than the Dredge Area, allowing for increased mixing. The risk of pesticides, PFAS and PCBs in sediments is less at the Landing Sites, compared to the Dredge Area, however, will still be sampled for. COPC for the Landing Sites are outlined in Table 2.2 and discussed further in Section 4. All Landing Site samples will also be analysed for PSD and TOC.

Table 2.2 Potential risk of sediment contamination within sediments from the Landing Sites

Contaminant of potential concern	Landing Site Name	Risk rating	Reasons for risk	Assessment required?
Nutrients (leading to eutrophication and phytoplankton blooms)	Elizabeth Quay Matilda Bay Applecross Canning Bridge	High	The Swan Canning receives runoff from agricultural and industrial areas located upstream. Increased nutrient input and low flushing rates often causes harmful algal blooms in the middle Swan Canning Estuary. Eutrophication at the Landing Sites is considered high risk, given eutrophication in the broader Swan Canning system is common and the potential additive nutrient release during dredging requires assessment. Water sampling in RPS (2013) showed total nitrogen, total phosphorus, ammonia and reactive phosphorus exceeded FWG.	Yes
Metals	Elizabeth Quay Matilda Bay Applecross Canning Bridge	Medium	There are potential sources from vessel operations, refuelling, antifoulant paints, marine structures made from metals and/or storm water inputs.	Yes
Hydrocarbons	Elizabeth Quay Matilda Bay Applecross Canning Bridge	Medium	Hydrocarbons have been recorded in contaminated sites within the vicinity of all Landing Sites (DWER 2024a).	Yes
Organotin	Elizabeth Quay Matilda Bay Applecross Canning Bridge	Medium	Vessels frequently pass through/moor near the Landing Sites and there is a potential risk of organotin contamination.	Yes
Antifoulants	Elizabeth Quay	Medium	Since the global ban on the use of TBT, there has been a transition to copper based antifoulants. Paints with copper	Yes

Contaminant of potential concern	Landing Site Name	Risk rating	Reasons for risk	Assessment required?
	Matilda Bay		often contain additional booster biocides such as zinc pyrithione, diuron, irgarol 1051 or organic algaecides; and contamination by these TBT-replacement compounds present a risk to sediment quality. Non-TBT antifoulants have not previously been sampled in the vicinity of the Landing Sites. Vessels frequently pass through/moor near the Landing Sites and there is potential risk of antifoulant contamination.	
	Applecross			
	Canning Bridge			
ASS and MBOs	Elizabeth Quay	High	The Landing Sites are located in a high-moderate ASS risk area (DWER 2024b). Given the risk of ASS and known formation of MBOs in estuarine systems, MBO assessment will be completed to determine the presence of MBOs.	Yes
	Matilda Bay			
	Applecross			
	Canning Bridge			
PFAS	Elizabeth Quay	Medium	Elizabeth Quay's historical use as an unregulated landfill area during the 1960s and 1970s increases the risk of COPC presence in sediments. PFAS species were detected in sediments nearby to Elizabeth Quay in previous sampling competed for the Boorloo bridge (AECOM 2023).	Yes
	Matilda Bay	Low	Although PFAS was detected in surface waters throughout the Swan Canning Estuary, the site closest to Matilda Bay, and the site closest to Applecross/Canning Bridge recorded some of the lowest PFAS concentrations of all sites (DBCA 2022b). Concentrations exceeded the 99% level of species protection but were below the 95% level of species protection. There is a low risk of PFAS being disturbed in sediments at these Landing Sites from construction.	Yes
	Applecross			
	Canning Bridge			
OCPs	Elizabeth Quay	Medium	Elizabeth Quay's historical use as an unregulated landfill area during the 1960s and 1970s increases the risk for many COPC to be present in sediments. OCPs were detected in previous sampling conducted for the Boorloo and Matagarup Bridges construction (RPS 2013, AECOM 2023). DDE exceeded the ANZG (2018) DGV for 99% level of species protection (DBCA 2022a)	Yes
	Matilda Bay	Low		Yes

Contaminant of potential concern	Landing Site Name	Risk rating	Reasons for risk	Assessment required?
	Applecross		Sites are not within the vicinity of contaminated sites associated with pesticides and are located downstream which decreases the risk of agricultural runoff.	
	Canning Bridge			
PCBs	Elizabeth Quay	Medium	Elizabeth Quay's historical use as an unregulated landfill area during the 1960s and 1970s increases the risk for many COPC to be present in sediments. PCBs in sediments exceeded the ANZG (2018) DGV for high protection in DBCA (2022a), within the vicinity (<1 km) of Elizabeth Quay.	Yes
	Matilda Bay	Low	Sites are not within the vicinity of contaminated sites associated with PCBs and are located downstream which decreases the risk of industrial runoff.	Yes
	Applecross			
	Canning Bridge			
ACM	Elizabeth Quay	Medium	Within the vicinity of a known contaminated site for ACM (DWER 2024a).	Yes
	Matilda Bay	Medium		Yes
	Applecross	Low	No known ACM within the vicinity.	Yes
	Canning Bridge	Low		Yes

Note:

1. **Matilda Bay 1 and Matilda Bay 2 have been combined as one area for the purposes of COPC identification and sampling 2. ""ACM" = asbestos containing material, "ASS" = acid sulfate soils, "DGVs" = default guideline value, "DBCA" = Department of Biodiversity, Conservation and Attractions, "DDE" = dichlorodiphenyldichloroethylene ,"FWG" = freshwater guidelines, "EILs" = ecological investigation levels, "MBOs" = monosulfidic black oozes, "OCPs" = organochlorine pesticides, "PAHs" = polycyclic aromatic hydrocarbons, "PCBs" = polychlorinated biphenyls, "PFAS" = per- and poly-fluorinated alkyl substances, "TBT" = tributyltin**

3 Field sampling plan

3.1 Sampling design

3.1.1 Sampling sites

For dredge volumes ranging 100,000–141,000 m^3, the NAGD requires a minimum of 19 sampling sites for sediment characterisation (CA 2009). DWER (2019) requires a minimum of 68 samples for volumes ranging 110,000–120,000 m^3 to determine landfill classification and acceptance of material. In accordance with both guidelines (CA 2009, DWER 2019), 23 sample sites will be sampled to three horizons; totalling 69 samples. It is proposed to collect sediment samples within the Dredge Area to the target dredge design depth (~1 m) or to core refusal. Samples will be collected via divers using cores penetrated into the seabed and sub-sampled into approximate horizons (0–3 cm, 3–50 cm, 50–100 cm) to determine differences in COPC of the sediment profile across vertical horizons. (Table 3.1).

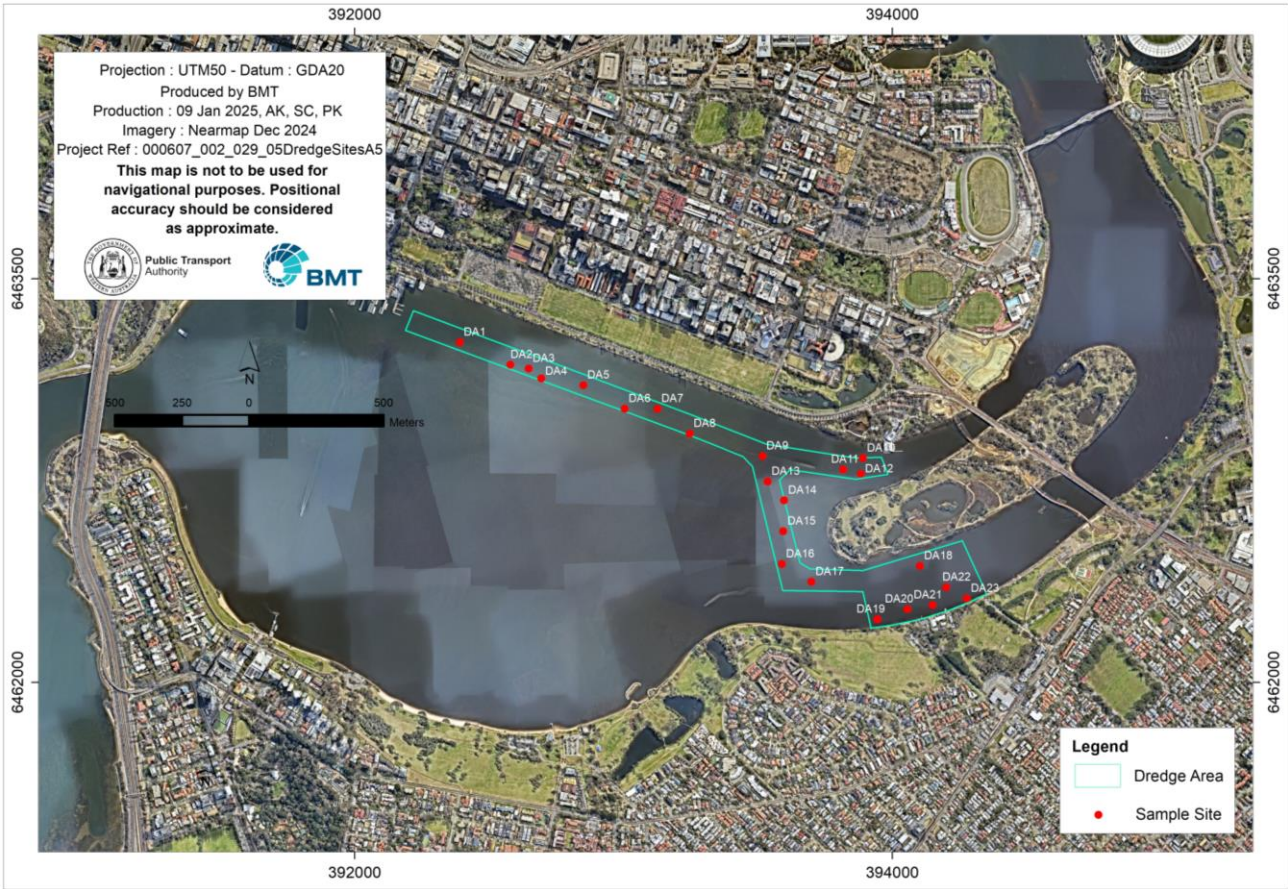

Figure 3.1 Location of sediment sampling sites in the Dredge Area

At each of the Landing Sites, it is proposed that three surface samples (~20 cm) are taken for the purpose of preliminary sediment characterisation (Figure 3.2, Table 3.1). Further sampling may be required as the project design progresses.

Figure 3.2 Location of sediment sample sites in the Landing Sites

Table 3.1 Proposed sediment sampling site coordinates and sampling depths at the Dredge Area and Landing Sites

Sampling area	Site	Coordinates (UTM50 GDA94)		Target sampling depth (cm)[2]
		Easting	Northing	
Dredge Area	DA1	392391	6463264	0–3, 3–50, 50–100
	DA2	392579	6463182	
	DA3	392648	6463167	
	DA4	392694	6463130	
	DA5	392851	6463105	
	DA6	393004	6463017	
	DA7	393126	6463018	
	DA8	393247	6462925	
	DA9	393517	6462842	
	DA10	393890	6462834	
	DA11	393816	6462792	
	DA12	393883	6462776	
	DA13	393536	6462747	
	DA14	393890	6462834	
	DA15	393597	6462678	
	DA16	393594	6462562	
	DA17	393589	6462441	
	DA18	393699	6462374	
	DA19	394102	6462433	
	DA20	394055	6462272	
	DA21	394148	6462288	
	DA22	394199	6462354	
	DA23	394276	6462312	
Elizabeth Quay Landing Site	EQ1	391877	6463625	~20
	EQ2	391867	6463589	
	EQ3	391873	6463605	
Matilda Bay Landing Site	MB1	388722	6461477	
	MB2	388735	6461535	
	MB3	388790	6461433	
	MB4	388634	6461154	

Sampling area	Site	Coordinates (UTM50 GDA94)		Target sampling depth (cm)[2]
		Easting	Northing	
	MB5	388696	6461162	
	MB6	388657	6461134	
Canning Bridge Landing Site	CB1	391707	6457957	
	CB2	391731	6458040	
	CB3	391717	6457932	
Applecross Landing Site	AP1	391511	6457953	
	AP2	391574	6457963	
	AP3	391449	6457966	

Note:

1. **'UTM' = Universal Transverse Mercator; 'GDA' = Geocentric Datum of Australia.**
2. **Should core refusal result in the bottom sample horizon (50–100 cm) not being collected, then additional replicate samples will be collected at the site to meet minimum sample number requirements for the DWER (2019) Landfill Waste Classification guidelines.**

3.1.2 QA/QC Samples

Two types of QA/QC samples will be included in the field sampling plan, as recommended by the NAGD (CA 2009):

- Triplicate: at 10% of sampling sites, three separate samples will be collected from the same site to determine the variability of the physical and chemical sediment characteristics at the scale of sampling.
- Split: at 5% of sampling sites, the sample shall be thoroughly mixed then split into three sub samples to assess laboratory variation, with two of the three samples analysed at the primary laboratory (intra-laboratory splits) and the third sample analysed by a reference laboratory (inter-laboratory split).

For the proposed sampling design, three triplicate samples (sites DA4, DA8; DA14; Table 3.1) and two split samples (sites DA2, DA12; Table 3.1) will be collected from the Dredge Area, resulting in ten additional samples for analysis (refer to Section 3.1.3). At the Landing Sites two triplicate samples (EQ2, CB1) and split one sample (MB1) will be collected; resulting in six additional samples for analysis. Analysis for PSD will be completed on the triplicate samples but not on the split sample.

A travel blank and a rinsate will be collected per each day of sampling to assess potential cross-contamination during sampling and transport.

PFAS samples present a high risk of contamination in the field and in the laboratory. In accordance with the PFAS NEMP (HEPA 2025) QA/QC samples should be collected at the higher rate of one in every ten primary samples that is predominantly satisfied by the NAGD (2009) QAQC requirements. .

3.1.3 Samples to be analysed

In total, 108 sediment samples will be collected from the relevant areas including QA/QC samples (Table 3.2). All samples collected will be sent to the laboratory for physical and chemical analyses, as outlined in Section 4.1.

Table 3.2 Proposed number of samples to be collected from Dredge Area and Landing Sites

Sampling area		Total number of samples to be collected
Dredge Area		69 (DA1–DA23; 3 horizons)
Landing Sites		15 (3 surficial samples from each of the five Landing Sites)
QA/QC[1]	Triplicate samples (DA4, DA8, DA14, EQ2, CB1)	10
	Split samples (DA2, DA12, MB1)	6
	Rinsate	4[2]
	Travel blank	4[2]
Total		108

Notes:

1. QA/QC samples will only be sampled from surface horizons only
2. One per day, assuming four days of sampling

3.2 Field operations and procedures

3.2.1 Health and safety

Prior to the commencement of sampling, a Dive Project Plan and Job Hazard Analysis (JHA) shall be completed to identify and address the workplace health and safety associated with the survey. All field personnel shall be required to review and sign the Dive Project Plan and JHA.

The dive team will consist of an ADAS (Australian Diver Accreditation Scheme) qualified dive supervisor (to AS 2815.5), two ADAS qualified divers (to a minimum of AS 2815.1) and a vessel master. The dive team will be responsible for collection, sub-sampling and logging of all sediment samples.

Sediment sampling can pose a moderate to high risk to divers, mainly due to vessel traffic. PTA will be consulted to determine potential vessel traffic management requirement for execution of the field survey. There is a low risk of personal injury from the use of the sampling equipment and the sediments to be sampled are considered to pose little risk to the health of field personnel. There are few hazardous substances required to complete the field sampling. Those required are of low risk to field personnel (i.e. Liqinox[1] and medical oxygen). The use of hazardous substances is risk-assessed as part of the JHA, and material safety data sheets for hazardous substances will be available in the field.

Appropriate personal protective equipment (PPE) will be worn by all field personnel, including the use of inert gloves while handling sediment samples.

3.2.2 Contingency

In the event of delays due to bad weather or critical equipment failure, sampling will be continued as soon as safely possible. In case of extended delays, any samples already collected will be submitted to the laboratory for testing rather than being held until the completion of the entire sampling program. Any deviation from the procedures outlined in this document will be noted in the DEIA, and records of sample delivery to the laboratories will be filed and supplied on request.

[1] Liquinox is a PFAS free and anionic residue free cleaning product

The recommended sample holding times, storage and transport, as defined within the NAGD (CA 2009) and as advised by the analysis laboratories will be adhered to. Should any holding times be exceeded, BMT will discuss sample integrity with the relevant laboratories and derive a contingency plan for sample analysis. PTA will be advised of required contingency.

3.2.3 Sediment collection and processing

A hand-held global positioning system (GPS) will be used to locate the proposed sediment sampling sites (Table 3.1). Sites may be manually re-positioned if required (i.e. restricted site access due to safety issues, moored vessels; if target sampling depths cannot be reached or if the there is only wrack material at the site. .The 'actual' location of each site will be recorded on the GPS (accuracy ±5 m) to confirm the sampled location.

Sediments within the Dredge Area will be sampled using diver collected cores (Table 3.1). Cores should comprise of high density polyethylene (HDPE) silicone tubing, to avoid PFAS contamination (HEPA 2020). Cores will be manually driven into the sediment at each sample site to the proposed depth of dredging or seabed refusal. Cores will then be extracted onto a core tray and subsampled for each horizon (Table 3.1). If insufficient sediment material is encountered for sampling, additional cores will be collected from the same site and corresponding sample intervals to form composite samples for required laboratory volumes.

Sediments within the Landing Sites will be sampled using a Van Veen sediment grab, which targets a depth of ~0.2 m (Table 3.1). One grab sample will be collected from each sample site, with exception of the triplicate QA/QC sampling sites that will require collection of three grab samples (Section 3.1.2). If diver access is possible, surficial samples can also be obtained via divers and of smaller core lengths.

Sediment samples will be extracted into the mixing bowl for each interval after recovery and photographed. Prior to sample processing, a field sediment inventory and description log will be completed. For volatile substances (TPHs, TRHs, PAHs and BTEX), sub-samples will be extracted (using a spoon) immediately into the appropriate container(s) provided by the laboratory(s) to limit the exposure of volatiles. The remaining sample will be homogenised in a glass bowl using a spoon until the colour and texture is uniform. Subsamples for the remaining analytes will be extracted from the homogenised sample and placed into the appropriate container(s) provided by the laboratory(s). Teflon spoons and trays should be avoided as they contain PFAS components, HDPE sampling equipment is recommended. Additional samples from each site will be collected and stored for bioavailable and/or elutriate testing, if required (refer to Section 4.2).

3.2.4 Cross-contamination control

To avoid cross-contamination among sampling areas and sites, all sampling equipment will be washed after each sampling site and rinsed with deonised water. PFAS free cleaning agents (i.e Liquinox) will be used for cross contamination control. Field personnel handling the samples will wear a pair of nitrile and powder-free gloves, changing these between sample collections at each site.

Attention will be given to the range of products that can cause PFAS contamination of samples including:

- new clothing, footwear, PPE and treated fabrics
- stain- and water-resistant products
- sunscreen, moisturisers, and cosmetics
- fast food wrappers

- PTFE materials (such as Teflon™)
- sampling containers with PTFE-lined lids
- foil
- glazed ceramics
- stickers and labels
- inks
- sticky notes and waterproof papers
- drilling fluids and decontamination solutions
- reusable freezer blocks.

3.2.5 Seawater collection

Approximately 1 L of site water per sediment sample will be collected for elutriate analysis if required (refer to Section 4.2). The seawater will be collected following the completion of sediment sampling to ensure transport to the relevant laboratories as soon as possible. Seawater will be collected away from potential contamination sources and any localised turbidity.

3.2.6 Sample storage, transport and laboratory receipt

The required sample volumes and containers for each analyte will be provided by the relevant laboratories along with storage methods and anticipated holding times. Samples will be stored refrigerated or frozen on completion of sampling and remain in storage until transported to the relevant laboratories. Samples should not be cooled with reusable icepacks (as these contain PFAS), and ice double-bagged in plastic (polyethylene) bags will be used instead. Samples will be consigned with a Chain of Custody (CoC) form to laboratories to allow sample tracking and ensure the correct sample analyses, storage, and holding times. The recommended sample holding times, storage and transport, as defined within the NAGD (CA 2009) or as advised by NATA accredited laboratory will be referred to for sampling handling. Should any holding times be exceeded, BMT will discuss sample integrity with the relevant laboratories and derive a contingency plan for sample analysis, PTA will be advised of any such occurrences.

3.2.7 Benthic habitat video ground truthing

To confirm the presence/absence of potential BCH, tow videos will be conducted in the vicinity of the Dredge Area and Landing Sites. The purpose of the imagery is to produce a BCH map, which will characterise BCH and determine whether a Native Vegetation Clearing Permit (NVCP) is required for the dredging campaign. Tow videos from BCH surveys will be classified into a hierarchical system based on substrate and biota, with categories to be agreed upon with PTA prior to analysis. It is not anticipated that Elizabeth Quay will require BCH mapping due to the high level of existing disturbance and therefore drop cameras will be used to confirm presence of BCH in this location. Ground truth data will be compared to existing datasets including available satellite imagery. Ground truth data will provide data to support a future NVCP, if required. Proposed start and end coordinates of the Dredge Area and Landing Site transects are listed in Table 3.3 and shown in Figure 3.3-Figure 3.5.

Table 3.3 Proposed coordinates of benthic communities and habitat transects in the Dredge Area and Landing Sites

Transect	Transect point	Coordinates (UTM50 GDA94)	
		Easting	Northing
T1	Start	392127	6463236
	End	392228	6463476
T2	Start	392214	6463199
	End	392333	6463455
T3	Start	392327	6463151
	End	392427	6463420
T4	Start	392418	6463134
	End	392529	6463381
T5	Start	392512	6463098
	End	392512	6463098
T6	Start	392605	6463063
	End	392717	6463312
T7	Start	392697	6463026
	End	392810	6463278
T8	Start	391580	6462235
	End	391638	6462314
T9	Start	392896	6462958
	End	393019	6463200
T10	Start	392991	6462919
	End	393104	6463169
T11	Start	393073	6462886
	End	393187	6463136
T12	Start	393166	6462851
	End	393281	6463102
T13	Start	393254	6462812
	End	393371	6463065
T14	Start	393348	6462776
	End	393464	6463028
T15	Start	393412	6462729
	End	393537	6463005
T16	Start	393523	6462685
	End	393636	6462963
T17	Start	393658	6462702
	End	393724	6462942
T18	Start	393771	6462692

Transect	Transect point	Coordinates (UTM50 GDA94)	
		Easting	Northing
	End	393810	6462914
T19	Start	393892	6462713
	End	393901	6462890
T20	Start	393997	6462742
	End	393987	6462879
T21	Start	394081	6462779
	End	394051	6462907
T22	Start	394187	6462833
	End	394152	6462945
T23	Start	394204	6462906
	End	394300	6462942
T31	Start	393422	6462612
	End	393698	6462679
T32	Start	393458	6462495
	End	393722	6462599
T33	Start	393486	6462381
	End	393749	6462504
T34	Start	393582	6462234
	End	393741	6462449
T35	Start	393764	6462204
	End	393800	6462459
T36	Start	393883	6462432
	End	393893	6462210
T37	Start	393956	6462480
	End	394028	6462223
T38	Start	394090	6462496
	End	394118	6462249
T39	Start	394188	6462529
	End	394224	6462279
T40	Start	394255	6462556
	End	394326	6462342
T41	Start	394320	6462585
	End	394426	6462378
T42	Start	394417	6462645
	End	394542	6462457
T43	Start	394490	6462690
	End	394670	6462576

Transect	Transect point	Coordinates (UTM50 GDA94)	
		Easting	Northing
T51	Start	393278	6462492
	End	393327	6462578
T52	Start	393065	6462585
	End	393114	6462671
T53	Start	392947	6462774
	End	392997	6462860
T54	Start	392695	6462800
	End	392745	6462886
T55	Start	392411	6462853
	End	392461	6462939
T56	Start	391991	6463209
	End	392145	6463117
T57	Start	392115	6463345
	End	392145	6463432
T58	Start	391697	6463456
	End	391704	6463562
T59	Start	391459	6463354
	End	391407	6463439
T60	Start	391246	6463227
	End	391326	6463169
T61	Start	391541	6463115
	End	391591	6463201
T62	Start	391852	6463104
	End	391902	6463190
T63	Start	391284	6462814
	End	391343	6462894
T64	Start	391608	6462817
	End	391657	6462903
T65	Start	391862	6462740
	End	391957	6462787
T66	Start	392124	6462819
	End	392174	6462905
T67	Start	392260	6462545
	End	392310	6462631
T68	Start	392491	6462486
	End	392540	6462572
T69	Start	392801	6462475

Transect	Transect point	Coordinates (UTM50 GDA94)	
		Easting	Northing
	End	392851	6462561
T70	Start	393046	6462303
	End	393123	6462449
T71	Start	393264	6462153
	End	393267	6462319
T72	Start	393117	6462207
	End	393030	6462090
T73	Start	392739	6462258
	End	392922	6462266
T74	Start	392423	6462200
	End	392473	6462286
T75	Start	392156	6462209
	End	392206	6462295
T76	Start	391827	6462262
	End	391876	6462348
T77	Start	391998	6462498
	End	392048	6462584
T78	Start	391713	6462493
	End	391763	6462579
T79	Start	391407	6462471
	End	391485	6462525
T80	Start	391580	6462235
	End	391638	6462314
T81	Start	391914	6462082
	End	391964	6462168
T82	Start	392181	6461962
	End	392230	6462048
T83	Start	392444	6461921
	End	392494	6462007
T84	Start	392691	6461937
	End	392741	6462023
T85	Start	392955	6461883
	End	392917	6461975
T90	Start	388719	6461527
	End	388857	6461489
T91	Start	388681	6461461
	End	388824	6461416

Transect	Transect point	Coordinates (UTM50 GDA94)	
		Easting	Northing
T92	Start	388635	6461189
	End	388790	6461214
T93	Start	388635	6461113
	End	388798	6461134
T94	Start	391449	6457904
	End	391451	6458046
T95	Start	391496	6457897
	End	391556	6458043
T96	Start	391538	6457894
	End	391618	6457945
T97	Start	391754	6457932
	End	391619	6457979
T98	Start	391774	6458020
	End	391642	6458054
T99	Start	391791	6458099
	End	391678	6458137

Notes:

1. **"UTM" = Universal Transverse Mercator, "GDA" = Geocentric Datum of Australia. Gaps in transect numbers are intentional and reflect different sections of the Dredge Area and Landing Sites and allows for flexibility in addition/removal of transects**
2. **Indicative transects and subject to change to target priority and secondary transects within field survey times**

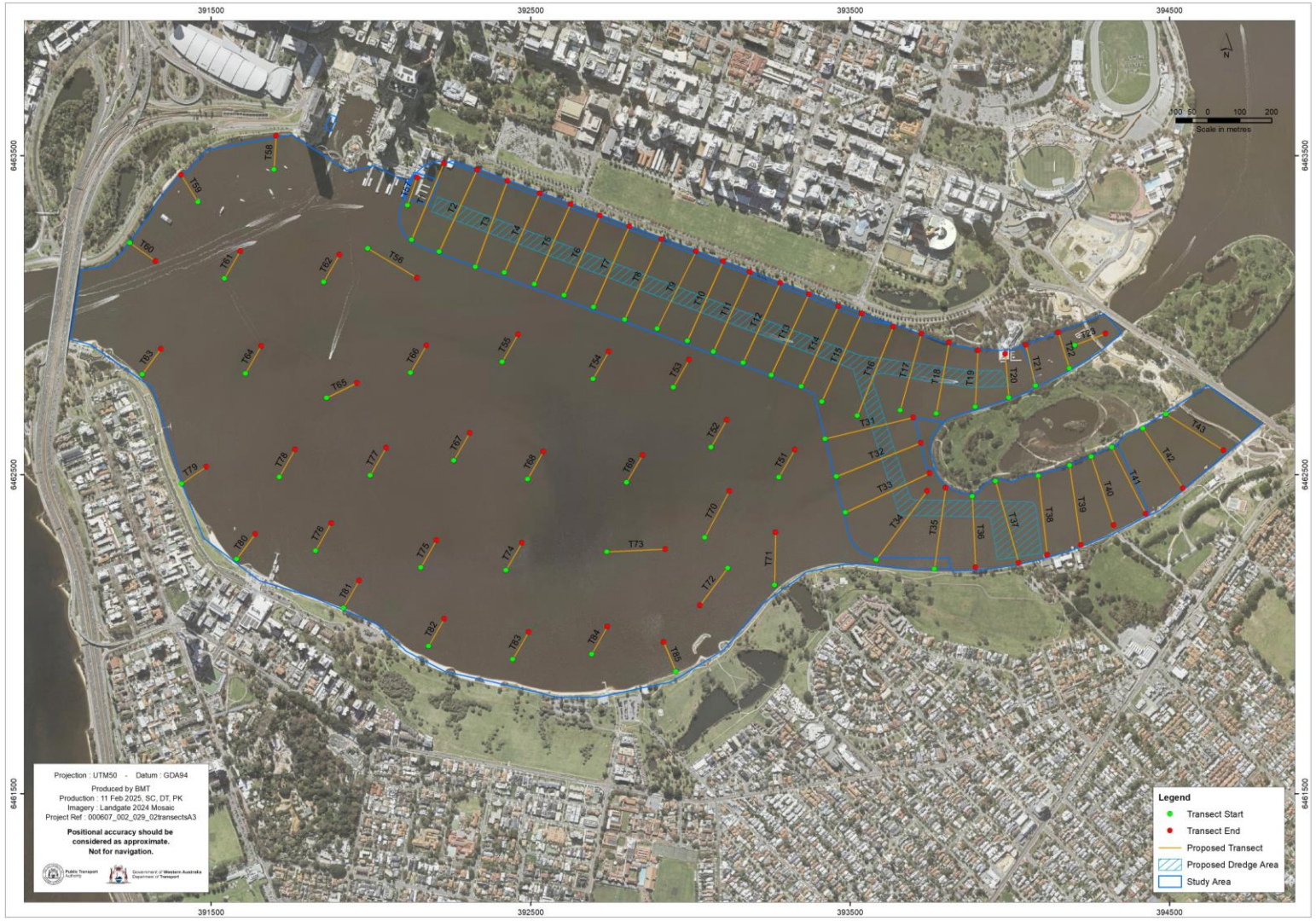

Figure 3.3 Proposed locations of benthic communities and habitat transects in the Dredge Area and Barrack Street Landing Site

Figure 3.4 Proposed locations of benthic communities and habitat transects in Matilda Bay Landing Site

Figure 3.5 Proposed locations of benthic communities and habitat transects in Canning Bridge and Applecross Landing Sites

4 Analysis Plan

4.1 Laboratory analysis and QA/QC

In recognition of the moderate to high risk of contamination of some analytes within sediments (Section 2.3.5) a risk-based staged approach has been adopted for selecting analytes for sediment sample elutriate analysis (Section 4.2). This is based on the potential sources of contamination identified (Section 2.3.5) that includes a review of historical data and area usage. Sediment sample analysis will be completed by National Association of Testing Authorities (NATA) accredited laboratories and will test blanks, spikes and standards and complete laboratory duplicates. Detailed laboratory method statements used for analyses of sediment samples, and the laboratory QA/QC procedures are available on request.

Table 4.1 Laboratory analysis plan for sediment samples for Dredge Area and Landing Sites sampling sites

Sampling area	Site	Metals	PSD	TOC	pH	CEC	Hydrocarbons	Elutriate Nutrients	ASS and MBOs	Organotins	PFAS	OCPs	PCBs	Antifoulants	ACM
Dredge Area	DA1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	DA2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	DA3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	DA4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	DA5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	DA6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	DA7	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	DA8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	DA9	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	DA10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	DA11	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	DA12	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	DA13	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	DA14	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	DA15	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	DA16	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	DA17	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	DA18	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	DA19	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	DA20	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	DA21	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	DA22	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	DA23	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Elizabeth Quay Landing Site	EQ1	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓
	EQ2	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓
	EQ3	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓
Matilda Bay Landing Site	MB1	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓
	MB2	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓

Sampling area	Site	Metals	PSD	TOC	pH	CEC	Hydrocarbons	Elutriate Nutrients	ASS and MBOs	Organotins	PFAS	OCPs	PCBs	Antifoulants	ACM
	MB3	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓
	MB4	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓
	MB5	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓
	MB6	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓
Canning Bridge Landing Site	CB1	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓
	CB2	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓
	CB3	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓
Applecross Landing Site	AP1	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓
	AP2	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓
	AP3	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓

Notes:

1. "ACM" = asbestos containing material, "ASS" = acid sulfate soils, "CEC" = cation exchange capacity, "MBO" = monosulfidic black oozes, "OCPs" = organochloride pesticides, "PCBs" -= polychlorinated biphenyls, "PFAS" = per- and poly-fluoroalkyl substances, "PSD" = particle size distribution, "TOC" = total organic carbon
2. Refer to Table B.2. in Annex B for detailed list of analytes within analytical suites.

4.2 Staged approach to secondary sample analysis as per NAGD

In the Dredge Area, immediate elutriate analysis of the 0-3 cm horizon is proposed for high risk analytes (nutrients, metals, PFAS and TBT). A staged approach is proposed for elutriates of the middle and bottom horizons (3-50 cm and 50-100 cm), with the exception of nutrients. Elutriate analysis of Landing Site surficial samples will be treated in the same manner as the 0-3 cm horizon from the Dredge Area samples, on the relevant analytes. For remaining analytes and horizons, bioavailable and elutriate testing will be completed on samples with contaminant concentrations exceeding the relevant guidelines as per NAGD (CA 2009; Figure 4.1). If applicable, any additional samples collected will also be analysed for concentrations of the contaminant(s) exceeding the relevant sediment quality guidelines (Figure 4.1). The relevant test statistics (refer to Section 4.4 and Annex B) for concentrations of the contaminant(s) will then be recalculated with the additional data. In accordance with the NAGD (CA 2009), if elutriate and/or bioavailable contaminant concentrations for the relevant sample(s) exceed the appropriate water quality guideline (refer to Section 4.4 and Annex B), further bioavailability and/or ecotoxicity testing may need to be considered. PTA will be advised if bioavailable and elutriate testing is required and will not be undertaken until approval is granted.

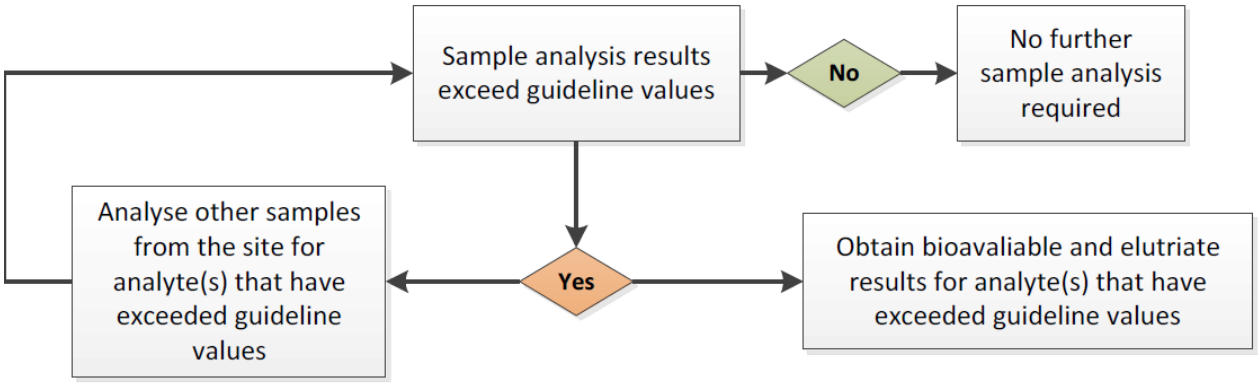

Figure 4.1 Staged approach to sample analysis

4.3 Staged approach to sample analysis for landfill waste classification

To assess the suitability of dredged material for landfill disposal, sediment quality data will be compared to DWER (2019) Landfill Waste Classification guidelines. Waste classification and appropriate landfill disposal option will be determined through a sample analysis step-based approach. The first assessment phase involves testing for total contaminant values (Table B.2.). If any contaminant exceeds the maximum Class IV contaminant threshold values, the second assessment phase should determine the Australian Standard Leaching Procedures (ASLP) leachate concentrations and compare values to the concentration limits (CL; Table B.3.).

During the first assessment phase, the sediment samples should be analysed for all the contaminants of concern and concentrations compared with the maximum contaminant threshold values and assigned a classification (Class I, II, III or IV; Table B.2.). The waste is then classified according to the highest class assigned for any of the analysed contaminants for consideration of disposal to an appropriate landfill site.

During the second assessment phase, the leachate concentrations should be compared against both the leachable concentration and the CL for the relevant waste classification (Table B.3.). The waste should then be classified according to the highest class assigned to any contaminant (Class I, II, III or IV) and disposed to an appropriate landfill site. If the leachable concentrations exceed the Class IV threshold values, material is required to be treated until the ASLP values are met (Table B.3.).

4.4 Data analysis and QA/QC

The PSD data from samples in the proposed Dredge Area and Landing Sites will be used to calculate particle settling times to provide an indication of potential turbidity generated / plume dispersion from dredging at the Dredge Area and construction operations at the Landing Sites. Information on the method used to calculate particle settling times is provided in Annex B.

Sediments and elutriate waters from the Dredge Area and Landing Sites will be assessed against the NAGD Screening Levels (CA 2009), ANZG (2018) DGVs, ASS Guidelines (DER 2015), Contaminated Sites Guidelines EILs, ESLs and HILs (NEPC 2013, DWER 2021), PFAS NEMP (HEPA 2025), Sullivan et. al. (2018) and Landfill Waste Classification (DWER 2019). Assessment against key guidelines is summarised in Table 4.2. The concentrations of organic analytes will be normalised to 1% TOC to provide a measure of their bioavailability and to allow assessment against the relevant guidelines. Where appropriate, test statistics will be calculated for the concentrations of each analyte for comparison against guidelines values.

Table 4.2 Summary of methods for sediment quality data assessment against key relevant guidelines

Guideline	Assessment method
NAGD (CA 2009) Screening Level	95% upper confidence limit
ANZG (2018)/ANZECC/ARMCANZ (2000)	Mean of the elutriate water sample concentrations[1] Median of total sediment sample concentrations
DWER (2019)/DER (2015)	Individual sample concentrations
PFAS NEMP (HEPA 2025)	Individual sample concentrations
MBOs (Table B.1.	Individual sample concentrations and physical indicators
DWER (2021)/NEPC (2013) EILs, ESLs, HILs	Maximum and 95% upper confidence limit Arithmetic mean (if practical) • The standard deviation of the results must be less than 50% of the relevant EIL/ESL/HIL • No single value must exceed 250% of the relevant EIL/ESL/HIL.

Notes:

1. **As per Appendix A, Phase III (page 39) of the NAGD (2009), mean values from Phase III testing will be compared to assessment criteria. Applies to elutriate/leachate concentrations in water, if required (i.e., Screening Levels Exceeded)..**
2. **"ANZG" Australian and New Zealand Guidelines for Fresh and Marine Water Quality, "Australian and New Zealand Environment and Conservation Council & Agriculture and Resource Management Council of Australia and New Zealand", "DER" = Department of Environmental Regulation, "DWER" Department of Water and Environmental Regulation, "EIL" = ecological investigation level, "ESL" = ecological screening level, "HIL" = health investigation level, "NAGD" = National Assessment Guidelines for Dredging, "NEPC" National Environmental Protection Council**

Further detail on data analysis methods and the screening thresholds for each analyte is provided in Annex B. If the analyte concentrations meet the relevant guidelines sediments will be considered suitable for dredging. The Landing Sites and method may be dependent on the concentrations of COPC and secondary testing for small-scale disturbance of sediments during construction and operation.

The analyte concentrations in the QA/QC triplicates and field splits will be analysed using the methods specified by the NAGD (CA 2009) to determine the relevant percent differences (splits) and relative standard deviations (triplicates). Refer to Annex B for further details.

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Annex A Legislation and guidelines

Environmental Protection Act 1986

The *Environmental Protection Act 1986* (EP Act) is the key legislation governing environmental protection and management in WA. The EP Act (mainly Part IV) together with the Environmental Impact Assessment (Part IV Divisions 1 and 2) Administrative Procedures 2021 (EPA 2024a) specifies the objectives and procedures for Environmental Impact Assessment (EIA) in WA. The EIA (Part IV Divisions 1 and 2) Procedures Manual (EPA 2024b) provides an overview of the decision-making process undertaken by Environmental Protection Authority (EPA) for the assessment of significant proposals.

The EPA administers and operates under the EP Act and its regulations. The EPA applies a significance framework to the EIA process of significant proposals against key environmental factors and objectives established under the EP Act. The Statement of environmental principles, factors, objectives and aims of EIA (EPA 2023) guidance applies the concept of significance to environmental factors and objectives to organise and systemise the EIA and reporting process. Some environmental factors are supported by technical guidance documents that outline methods/and or procedures for consideration in preparation of EIAs. The environmental factors and objectives subject to EPA's assessment are outlined in Table A.1.

Table A.1. Environmental Protection Authority environmental factors and objectives

Theme	Environmental Factor	Environmental Protection Authority Objective
Sea	Benthic communities and habitat	To protect benthic communities and habitats so that the biological diversity and ecological integrity are maintained.
	Coastal processes	To maintain the geophysical processes that shape coastal morphology so that the environmental values of the coast are protected.
	Marine environmental quality	To maintain the quality of water, sediment and biota so that the environmental values are protected.
	Marine fauna	To protect marine fauna so that biological diversity and ecological integrity are maintained.
Land	Flora and vegetation	To protect flora and vegetation so that biological diversity and ecological integrity are maintained.
	Landforms	To maintain the variety and integrity of distinctive ecological landforms so that environmental values are protected.
	Terrestrial environmental quality	To maintain the quality of land and soils so that environmental values are protected.
	Subterranean Fauna	To protect subterranean fauna so that biological diversity and ecological integrity are maintained.
	Terrestrial fauna	To protect terrestrial fauna so that biological diversity and ecological integrity are maintained.
Water	Inland waters	To maintain the hydrological regimes of groundwater and surface water so that environmental values are protected.

Theme	Environmental Factor	Environmental Protection Authority Objective
Air	Air quality	To maintain air quality and minimise emissions so that environmental values are protected.
	Greenhouse Gas Emissions	To reduce net greenhouse gas emissions in order to minimise the risk of environmental harm associated with climate change.
People	Social surroundings	To protect social surroundings from significant harm.
	Human health	To ensure that human health is not adversely affected.

Source: EPA (2023)

If a proposal is likely to result in significant environment impacts, the proponent must refer the proposal to EPA under Section 38(1) of the EP Act (Part IV) for assessment and approval if required.

Department of Water and Environmental Regulation (DWER) administers Part V of the EP Act and the supporting Environmental Protection Regulations 1987. Environmental regulation functions include licencing, approvals, compliance and enforcement in relation to the generation of waste, clearing of native vegetation, noise and emissions and discharges for activities with the potential to cause environmental pollution.

For dredging campaigns that require the clearing of native vegetation (aquatic and/or terrestrial) a native vegetation clearing permit (NVCP) must be approved by DWER prior to commencement of the campaign unless impacts are otherwise approved for clearing following formal referral and assessment of the project by EPA.

Environment Protection and Biodiversity Conservation Act 1999

Dredging campaigns anticipated to significantly impact matters of national environmental require assessment under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Environmental matters of national significance are defined in the EPBC Act as:

- listed threatened species and ecological communities
- migratory species protected under international agreements
- Ramsar wetlands of international importance
- the Commonwealth marine environment
- the Great Barrier Reef Marine Park
- World Heritage properties
- National Heritage places
- nuclear actions.

The applicability of the EPBC Act to the dredging campaign will be assessed in the Dredging Environmental Impact Assessment following the sampling campaign.

National Assessment Guidelines for Dredging

The National Assessment Guidelines for Dredging (NAGD; CA 2009) in support of the EP Sea Dumping Act provide a framework for environmental impact assessment and permitting of the ocean disposal of dredged material and include information on:

- evaluating alternatives to ocean disposal
- assessing sediment quality
- assessing dredging and disposal areas
- assessing potential impacts on the marine environment and other users
- determining management and monitoring requirements.

Although ocean disposal is not proposed for material from the Dredge Area, the guidelines provide a useful framework for the assessment and management of dredging projects and have been used to inform this SAP.

Australian and New Zealand Guidelines for Fresh and Marine Water Quality

Contaminants in sediments that exceed NAGD Screening Levels (CA 2009) require bioavailability and elutriate testing to assess if the bioavailable fraction for uptake by marine organisms and potential impacts to marine water quality from contaminants released during dredging (CA 2009). The Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG 2018; ANZECC/ARMCANZ 2000) are applied to assess water quality impacts from physical/chemical stressors and/or toxicants.

Default guideline values (DGVs) for physical and chemical stressors (PC stressors) are available for marine geographic regions from regional reference site data in surface and bottom waters. The relevant section of the Swan Canning Estuary records salinity levels consistently above 25 ppt, which is considered a saline environment (DBCA 2024a). The DGVs for toxicants are derived for differing levels of species protection, with the level of protection determined through the current or desired condition of the ecosystem that is assigned. The Dredge Area and Landing Sites are located in an estuarine environment and within the Swan Canning Riverpark, however; have been subject to historical and current anthropogenic disturbance. Therefore it is proposed the Dredge Area and Landing Sites will be afforded the ANZG (2018) marine DGVs for 95% species protection and the 99% marine DGVs will be applied depending on the analyte suite (i.e. bioaccumulating toxicants). ANZG (2018) DGVs will not be applied for PC stressors, as there is not an applicable Integrated Marine and Coastal Regionalisation of Australia zone for the Swan Canning Estuary. Comparison of PC stressors to ANZECC/ARMCANZ (2000) DGVs will be applied for south-west Australia estuaries.

Landfill Waste Classification and Waste Definitions 1996 (as amended 2019)

The Landfill Waste Classification and Waste Definitions 1996 (as amended 2019) guideline (DWER 2019) provides guidance and criteria to be applied in determining the classification of wastes for acceptance to landfills licensed or registered in WA in accordance with Part V Division 3 of the EP Act. Classification of waste is undertaken through a step-based approach and requires comparison of waste contaminant concentrations against guideline values provided in DWER (2019) and classify the waste according to the category assigned to any contaminant.

Although disposal of dredged material is undefined at this stage in the project design, if sediment sampling indicates that dredged material does not meet relevant guidelines for onshore disposal, then landfill disposal may be considered. For this purpose, a list of analytes relevant for assessment against

the DWER (2019) guidelines has been included in the SAP and will be used to determine waste classification and appropriate landfill disposal, if required.

Contaminated Sites Act 2003 (WA) and Contaminated Sites Guidelines

The disposal of potentially contaminated dredge sediments to land may create or disturb an existing contaminated site. The identification, management and remediation of contaminated sites is governed by the *Contaminated Sites Act 2003* (CS Act). The Assessment and Management of Contaminated Sites: Guidelines (DWER 2021) provide guidance on the assessment and management of contaminated sites under the CS Act. While land disposal of dredged/excavated material is not specifically considered in the guidelines, disposal of contaminated dredge material to land may present a potential risk to human health and the environmental and requires assessment. The feasibility for onshore disposal will be considered and an initial high-level screening of potential contaminants in dredge sediments will be assessed against the National Environment Protection (Assessment of Site Contamination) Measure guidelines (as referenced in the Contaminated Sites Guidelines; DWER 2021) to assess the ecological and human health risks associated with material once disposed to land (NEPC 2013[2]).

Swan and Canning Rivers Management Act 2006 and Swan and Canning Rivers Management Regulations 2007

Department of Biodiversity, Conservation and Attractions (DBCA) has planning and development authority over the Swan Canning Development Control Area (DCA). The Dredge Area and Landing Sites are located within Sections 15, 16 and 18 of the DCA (DBCA 2024b). Consultation with DBCA is required to understand the permits required to operate and develop within the DCA, and ultimately their approval under Part 5 of the *Swan and Canning Rivers Management Act 2006* is required to complete dredging in the Dredge Area.

Waste Avoidance and Resource Recovery Act 2007

Waste management in WA is governed predominantly by the *Waste Avoidance and Resource Recovery Act 2007* (WARR Act) and the Waste Avoidance and Resource Recovery Levy Regulations 2008. The legislation and regulations may require levies if waste is disposed of at prescribed premises as defined in the Environmental Protection Regulations 1987. The levies and other costs associated with disposal to prescribed premises (e.g. sampling and analysis, transport of material) can be prohibitive, and should be considered during the planning phase of the dredging program. Alternative options such as waste reuse, reprocessing or recycling should be considered in feasibility assessment for disposal options.

The WA Landfill Waste Classification and Waste Definitions 1996 (DWER 2019) provide guidance and criteria to be applied in determining the classification of wastes for acceptance to licensed or registered landfills in WA in accordance with Part V of the EP Act. Disposal of dredged material to prescribed premises outlined in the Environmental Protection Regulations 1987 requires sampling of the material to assess the potential contamination status to the requirement of the receiving premise.

In situations where material is not considered waste for beneficial reuse and can be classified as clean or uncontaminated fill, there may not be a requirement for a prescribed premise licence or levy payment for disposal of the material. Advice should be sought from DWER and/or the chosen landfill/resource recycling facility for specific levy/licencing requirements under the EP Act and WARR Act. Disposal/stockpiling (for future use) of material may also require a licence under the Environmental

[2] No onshore disposal areas have been selected to receive dredged material and background data from onshore areas to inform calculation of site specific EILs will not be sampled; however, comparison with DWER (2021) and NEPC (2013) will be completed to provide an initial high-level screening of dredge sediments for context

Protection Regulations 1987. Advice should be sought from DWER in situations to determine the appropriate licence requirements.

Acid Sulfate Soils Guidelines

Acid sulfate soils (ASS) are naturally occurring soils, sediments and peats containing iron sulfides, primarily in the form of pyrite, and occur in low-lying land areas bordering coastal, estuarine and wetland environments throughout WA. Dredging has the potential to generate ASS in coastal and estuarine environments and cause environmental harm by increasing acidity, and mobilisation of metals/nutrients into the water column. The Acid Sulfate Soils Guidelines Series (DER 2015) provide guidance to identify ASS risk areas and assessment methods, including sampling and reporting for material intended for land reclamation purposes. These guidelines outline a risk-based assessment approach for ASS under the *Contaminated Sites Act 2003*. The potential sulfuric acidity of the sediment is compared against the Texture-based Action Criteria (DER 2015; Annex B).

National Acid Sulfate Soils Guidance

The National Acid Sulfate Soils Guidance developed by the Commonwealth Government and the National Committee for Acid Sulfate Soils, provides clear, non-prescriptive advice for managing ASS based on current scientific knowledge. It includes guidance based separated by geographical settings, field and laboratory methods, and soil and contamination management (dewatering, dredging and disturbance of mono-sulfidic black oozes). In particular, the 'Guidelines for the dredging of acid sulfate soil sediments and associated dredge spoil management' provides technical and procedural advice to avoid environmental harm from ASS encountered during dredging projects (Sullivan et al 2018, Simpson et al. 2018). This document describes a framework for assessing dredged material, management alternatives and options to minimise potential impacts relating to ASS.

PFAS National Environmental Management Plan

Per- and poly-fluorinated alkyl substances (PFAS) are known as "forever chemicals" due to their widespread environmental prevalence and unusual chemical compositions. The PFAS National Environmental Management Plan (NEMP; HEPA 2025) developed by the Heads of Environmental Protection Authority in Australia and New Zealand, provides guidance for the management of these substances in environments, with a focus on prevention and management of contamination. Currently no published guidelines are available for PFAS in aquatic sediments in NEMP (2025); however, it provides a useful framework for sampling and can be used for indicative comparison to soil and interim marine water guidelines.

Aboriginal Heritage Act 1972

The Dredge Area falls within the Derbal Yaragan (Swan River); Aboriginal Cultural Heritage (ACH) Registered Place 3536, as well as partially intersecting Midgegooroo's Execution and Burial Site; ACH Registered Place 29278 (DPLH 2024). Place 29278 boundary intersect with the Dredge Area is unclear on Department of Planning, Lands and Heritage (DPLH) Aboriginal Cultural Heritage Inquiry System (ACHIS) and DPLH should be consulted to confirm the official gazetted boundary. Under the *Aboriginal Heritage Act 1972* (AH Act) Aboriginal sites, as defined by the AH Act and including the aforementioned ACH registered places, are protected from harm without consent. In relation to the ACH registered places above, to complete sediment quality assessment a Regulation 10 consent will need to be approved under the AH Act to disturb or remove sediments. BMT understands that PTA is in the process of obtaining a Regulation 10 and heritage monitors (organised by PTA) for sampling days may be required.

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Annex B Data Analysis Methods

Particle settling times

The particle settling velocities will be used to calculate the time for 50% and 90% of the particles to settle out of 1 m of water for each sample using. Particle settling times will be calculated using Stoke's Law, which estimates the particle settling velocity based on the diameter and density of the particles. The settling velocities will then be used to estimate the time taken for sediment to settle through 1 m of water. Settling velocity will not be calculated for sediment samples >45% silt and clay content as Stokes' Law is not applicable for material with high fines content. Based on previous sediment sampling in the vicinity of the Dredge Area showing high proportions of silts and clays (RPS 2013, AECOM 2023), samples are anticipated to contain >45% silt and clay and will be sent to a laboratory equipped with a sedigraph capable of calculating settling velocities.

Normalisation of organics

Total organic carbon (TOC) is the main binding constituent for organic substances in marine sediments. The NAGD (CA 2009) requires organics to be normalised to 1% TOC for appropriate comparison to NAGD Screening Levels (CA 2009). The normalised results allow for comparison of different sediment samples and provide an indication of the bioavailability of organic analytes. A TOC greater than 1% increases the binding capacity of organics to become less biologically available, therefore normalisation will reduce the measured value proportionally (the reverse also applies). Normalisation is appropriate over a TOC range of 0.2–10%. For TOC <0.2% or TOC >10%, the maximum and minimum values of 0.2 and 10% TOC are used for normalisation, respectively. Where the organic data is below the laboratory limit of reporting (LoR) normalisation will not be completed.

Calculation of 95% upper confidence limit

Contaminant concentrations in sediment samples will be compared to the NAGD Screening Levels (CA 2009) that require calculation of the 95% upper confidence limit (UCL) of the mean (CA 2009). Data will be first tested for normality using the software ProUCL 5.2 (USEPA 2022). The software determines the appropriate method for calculating the 95% UCL depending on the distribution of the data and dataset size, including the proportion of values below the LoR (which introduces statistical complexities into analyses). These methods may include parametric (such as Student's t-UCL) or nonparametric (such as bootstrap) methods. Where sample numbers are insufficient to complete the calculations, the individual sample concentrations were compared to the NAGD Screening Levels (CA 2009).

Australian & New Zealand Guidelines for Fresh and Marine Water Quality

Mean elutriate concentrations extracted from sediments will be compared to ANZG (2018) marine water quality guidelines as per NAGD (CA 2009), if required and where applicable. ANZECC/ARMCANZ (2000) guidelines will be applied where there are no published updates in ANZG (2018). Areas that are frequently used by vessels are considered to be more disturbed environments and are typically assigned a moderate level of ecosystem protection. If analysis is required, elutriate contaminant concentrations for the Dredge Area and Landing Site samples will be compared to the ANZG (2018) marine DGVs for 95% or 99% species protection levels, given the existing level of disturbance of this environment or analyte suite, respectively.

Analysis of analyte concentration below the limit of reporting

Generally, half the laboratory LoR value was used as a substitute for data below the LoR in accordance with the NAGD (CA 2009). A large proportion of data below the LoR has the capacity to bias subsequent

analyses leading to underestimation of contamination. USEPA (2022) does not consider a 95% UCL of the mean calculated based upon few detected values to provide reliable estimates. Therefore, where the data contain values below the LoR, the following protocol was applied (based on ANZG 2018):

- Where >25% of concentrations are below the LoR, descriptive statistics (means and percentiles) or inferential analysis (including the calculation of confidence limits) will not calculated. Instead, individual sample results were compared to the triggers and discussed accordingly.

- Where ≤25% but >0% of concentrations are below the LoR, confidence limits were calculated via two methods; once using the normalised estimate based on half the LoR as the replacement value and once using zero as a replacement value. This information was used to inform the interpretation of results, in particular, whether the choice of replacement value affected the outcome of the analysis.

Data analysis for potential elutriate analysis will apply half the LoR to calculate summary statistics and mean concentrations as per NAGD (CA 2009).

Ecological investigation levels (EILs), ecological screening levels (ESLs) and health investigation levels (HILs)

Contaminant concentrations in sediment samples will be assessed Ecological Investigation Levels (EILs), Ecological Screening Levels (ESLs) and Health Investigation Levels (HILs) from the NEPC (2013) guidelines as referenced in DWER (2021) Contaminated Sites Guidelines. Calculation of EILs (for chromium, copper, nickel, lead, and zinc) require the addition of ambient background analyte concentrations (from reference site data) to define contaminant limits for ecological investigation[3]. These calculations also factor the physical sediment properties affecting mobility of metals (i.e., TOC, cation exchange capacity [CEC], pH and % clay) as per DWER (2021) and NEPC (2013).

The maximum and the 95% UCL of the arithmetic mean of sediment contaminant concentrations will be compared to the appropriate EILs, ESLs, and HILs (NEPC 2013). For assessment against the relevant EILs, ESLs and HILs, the following criteria are specified in NEPC (2013):

- standard deviation of the sample data must be less than 50% of the relevant value

- no single value must exceed 250% of the relevant value.

Contaminant concentrations in sediments from the Dredge Area will be compared to EILs and ESLs for “urban residential / public open spaces” and the relevant HIL “C” for “public open spaces”. If alternative areas are chosen for disposal as the project design progresses, other guidelines relevant to the receiving land use (i.e. commercial/industrial areas) may be applicable.

Acid sulfate soil base accounting

The reduced inorganic sulfur content (SCr [%S]) was assessed against the texture-based Action Criteria (DER 2015) and where exceeded, the total net acidity was calculated via acid-base accounting (ABA), providing an estimate of the actual and potential acidity of a sediment sample, using the following equation (Ahern et al. 2004):

$$Net\ acidity = Potential\ sulfidic\ acidity + Existing\ acidity - \frac{ANC}{FF}$$

[3] No onshore disposal areas have been selected to receive dredged material and background data from onshore areas to inform calculation of site specific EILs will not be sampled; however, comparison with DWER (2021) and NEPC (2013) absolute values and ranges for these metals will be completed to provide an initial high-level screening of dredge sediments for context

where:

- potential sulfuric acidity of the sediment (SCr) is converted from %S to mol H+/tonne by multiplying by 623.7.
- existing acidity (in mol H+/tonne) is the titratable actual acidity (TAAKCl) and/or net acid soluble sulfur (SNAS). If there is no existing acidity i.e., the sample has a potassium chloride suspension (pH_{KCl}) greater than 6.5, the TAA_{KCl} or SNAS is assumed to be zero and the existing acidity term is neglected.
- ANC is the acid neutralising capacity of the sediment to naturally neutralise acid produced (for example, due to the presence of carbonate material). ANC is represented by ANCBT (converted from $\%CaCO_3$ to mol H+/tonne by multiplying by 199.8). The ANC is assumed to be zero if there is existing acidity.
- FF is the fineness factor. As samples are finely ground in the laboratory, the net acid risk likely to be experienced in the field could be underestimated by the laboratory results. To allow for this, the measurement of ANC was divided by a FF during ABA. The minimum FF that should be applied to any ANC is 1.5; however, larger factors (e.g., 2, 2.5 or 3) may be applicable for shell or other forms of neutralising inclusions in the soil (DER 2015a).

If the results of the subsequent ABA indicate the net acidity is negative, then there is a low likelihood of ASS generation. If net acidity is positive, there is the potential for ASS generation

Indicators of Monosulfidic Black Ooze

To assess the potential for the presence of monosulfidic black oozes (MBOs) within the proposed Dredge Area and Landing Sites, an assessment of indicators of MBOs will be undertaken (Table B.1.). Upon receipt, data will be compared to the criteria for assessing indicators of MBOs outlined below. PSD data will also be considered for context in the assessment of indicators of MBOs.

Table B.1. Indicators of Monosulfidic Black Oozes

Parameters	Method	Criteria for assessment
Visual appearance	Field observation	Distinct strong black/dark grey colour, gel-like consistency and/or oily appearance
Smell	Field observation	Distinct ‘rotten egg’ odour
Organic matter content	Laboratory analysis	Greater than 5%
Moisture content	Laboratory analysis	Greater than 60% by weight
Acid volatile sulfur (AVS)	Laboratory analysis	Equal to or greater than 0.01% AVS

Note:

1. Criteria developed from DER (2015a,b), Simpson et al. (2018) and Sullivan et al. (2018).

Landfill Waste Classification and Waste Definitions thresholds

Sediment data will be compared to acceptance criteria published in DWER (2019); Contaminant Thresholds (Table B.2.) and leachable concentration) and Concentration Limit, where applicable (Table B.3.).

Guidelines and Screening Thresholds

The proposed analytes for sediment samples and relevant guidelines for assessment are presented in Table B.2. and Table B.3.

Table B.2. Proposed analytes for sediment and water quality samples and relevant guidelines for assessment

Analyte	Units	LoR[2]	NAGD[3]	ANZG Marine[4]		Landfill Classifications CT[1,5,6]				Contaminated Sites Guidelines			PFAS NEMP	Asbestos Guidelines (2021)[13]	ASS[14]	Indicators of MBOs[15]
				95%	99%	Class 1	Class 2	Class 3	Class 4	EIL[11]	ESL[10,11]	HIL[11]	99%			
Metals																
Aluminium	mg/kg	20	-	n/a	n/a	5	5	10	20	-	-	-	n/a	n/a	n/a	n/a
Arsenic	mg/kg	1	20	n/a	n/a	14	14	140	1400	50	-	300	n/a	n/a	n/a	n/a
Barium	mg/kg	1	-	n/a	n/a	5	5	10	20	-	-	-	n/a	n/a	n/a	n/a
Beryllium	mg/kg	1	-	n/a	n/a	2	2	20	200	-	-	90	n/a	n/a	n/a	n/a
Boron	mg/kg	1	-	n/a	n/a	5	5	10	20	-	-	20,000	n/a	n/a	n/a	n/a
Cadmium	mg/kg	0.1	1.5	n/a	n/a	0.4	0.4	4	40	-	-	90	n/a	n/a	n/a	n/a
Chromium (total)	mg/kg	1	80 (total)	n/a	n/a	10	10	100	1000	75–160	-	300	n/a	n/a	n/a	n/a
Cobalt	mg/kg	1	-	n/a	n/a	5	5	10	20	-	-	300	n/a	n/a	n/a	n/a
Copper	mg/kg	1	65	n/a	n/a	5	5	10	20	30–120	-	17,000	n/a	n/a	n/a	n/a
Iron	mg/kg	10	-	n/a	n/a	-	-	-	-	-	-	-	n/a	n/a	n/a	n/a
Lead	mg/kg	1	50	n/a	n/a	2	2	100	1000	270	-	600	n/a	n/a	n/a	n/a
Manganese	mg/kg	1	-	n/a	n/a	5	5	10	20	-	-	19,000	n/a	n/a	n/a	n/a
Mercury	mg/kg	0.01	0.15	n/a	n/a	0.2	0.2	2	20	-	-	80	n/a	n/a	n/a	n/a
Molybdenum	mg/kg	1	1	n/a	n/a	10	10	100	1000	-	-	-	n/a	n/a	n/a	n/a
Nickel	mg/kg	1	21	n/a	n/a	4	4	40	400	10–170	-	1200	n/a	n/a	n/a	n/a
Selenium	mg/kg	2	-	n/a	n/a	2	2	20	200	-	-	700	n/a	n/a	n/a	n/a
Silver	mg/kg	1	1	n/a	n/a	20	20	200	2000	-	-	-	n/a	n/a	n/a	n/a
Vanadium	mg/kg	1	-	n/a	n/a	-	-	-	-	-	-	-	n/a	n/a	n/a	n/a
Zinc	mg/kg	1	200	n/a	n/a	5	5	10	20	25–500	-	-	n/a	n/a	n/a	n/a
Elutriate metals																
Aluminium	µg/L	10	n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Arsenic	µg/L	1	n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Barium	µg/L	1	n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Beryllium	µg/L	1	n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Boron	µg/L	1	n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Cadmium	µg/L	1	n/a	5.5	0.7	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Chromium III	µg/L	1	n/a	27.4	7.7	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Chromium VI	µg/L	1	n/a	4.4	0.14	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Cobalt	µg/L	1	n/a	1	1[9]	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Copper	µg/L	1	n/a	1.3	0.3	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Analyte	Units	LoR[2]	NAGD[3]	ANZG Marine[4]		Landfill Classifications CT[1,5,6]				Contaminated Sites Guidelines			PFAS NEMP	Asbestos Guidelines (2021)[13]	ASS[14]	Indicators of MBOs[15]
				95%	99%	Class 1	Class 2	Class 3	Class 4	EIL[11]	ESL[10,11]	HIL[11]	99%			
Iron	µg/L	10	n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Lead	µg/L	0.2	n/a	4.4	2.2	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Manganese	µg/L	1	n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Mercury	µg/L	0.05	n/a	0.4	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Molybdenum	µg/L	1	n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Nickel	µg/L	1	n/a	70	7	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Selenium	µg/L	1	n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Silver	µg/L	1	n/a	1.4	0.8	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Vanadium	µg/L	1	n/a	100	50	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Zinc	µg/L	1	n/a	8	3.3	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Elutriate nutrients																
Total nitrogen	µg/L	0.1	n/a	750[7]		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Total phosphorus	µg/L	0.05	n/a	30[7]		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Filterable Reactive Phosphorous	µg/L	1	n/a	5[7]		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Ammonia[12]	µg/L	0.005	n/a	910	500	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Ammonium	µg/L	1	n/a	40[7]		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Nitrate+nitrate	µg/L	5	n/a	45[7]		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Organotins																
Tributyltin	µg Sn/kg	0.5–1	9	n/a	n/a	-	-	-	-	-	-	-	n/a	n/a	n/a	n/a
Monobutyltin, dibutyltin	µg Sn/kg	0.5–1	-	n/a	n/a	-	-	-	-	-	-	-	n/a	n/a	n/a	n/a
Elutriate organotins																
Tributyltin	µg/L	0.002	n/a	0.006	0.0004	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Polycyclic aromatic hydrocarbons (PAHs)																
Benzo[a]pyrene	mg/kg	0.004	-	n/a	n/a	-	-	-	-	-	-	-	n/a	n/a	n/a	n/a
Naphthalene	mg/kg	0.005	-	n/a	n/a	-	-	-	-	170	-	-	n/a	n/a	n/a	n/a
Total PAHs (16 PAHs)	mg/kg	0.1	-	n/a	n/a	-	-	-	-	-	-	300	n/a	n/a	n/a	n/a
Total PAHs (18 PAHs)	mg/kg	0.1	10	n/a	n/a	100	100	1000	4000	-	-	300	n/a	n/a	n/a	n/a
Carcinogenic PAHs	mgkg	0.1	-	n/a	n/a	-	-	-	-	-	-	3	n/a	n/a	n/a	n/a
Total petroleum hydrocarbons (TPHs)																
C_6–C_9	mg/kg	10	-	n/a	n/a	2800	2800	28,000	112,000	-	-	-	n/a	n/a	n/a	n/a
C_{10}–C_{14}	mg/kg	50–100	-	n/a	n/a	-	-	-	-	-	-	-	n/a	n/a	n/a	n/a
C_{15}–C_{18}	mg/kg		-	n/a	n/a	-	-	-	-	-	-	-	n/a	n/a	n/a	n/a
C_{15}–C_{28}	mg/kg		-	n/a	n/a	-	-	-	-	-	-	-	n/a	n/a	n/a	n/a
>C_{16}–C_{35} (aromatics)	mg/kg		-	n/a	n/a	450	450	4500	18,000	-	-	-	n/a	n/a	n/a	n/a

Analyte	Units	LoR[2]	NAGD[3]	ANZG Marine[4]		Landfill Classifications CT[1,5,6]				Contaminated Sites Guidelines			PFAS NEMP	Asbestos Guidelines (2021)[13]	ASS[14]	Indicators of MBOs[15]
				95%	99%	Class 1	Class 2	Class 3	Class 4	EIL[11]	ESL[10,11]	HIL[11]	99%			
>C_{16}–C_{35} (aliphatics)	mg/kg		-	n/a	n/a	28,000	28,0000	280,000	-	-	-	-	n/a	n/a	n/a	n/a
>C_{35}	mg/kg		-	n/a	n/a	-	-	-	-	-	-	-	n/a	n/a	n/a	n/a
C_{29}–C_{36}	mg/kg		-	n/a	n/a	-	-	-	-	-	-	-	n/a	n/a	n/a	n/a
Total TPH	mg/kg	50	550	n/a	n/a	-	-	-	-	-	-	-	n/a	n/a	n/a	n/a
Total recoverable hydrocarbons (TRHs)																
C_6–C_{10}	mg/kg	25	-	n/a	n/a	-	-	-	-	-	-	-	n/a	n/a	n/a	n/a
C_6–C_{10} less BTEX, coarse/fine	mg/kg	25	-	n/a	n/a	-	-	-	-	-	180	-	n/a	n/a	n/a	n/a
>C_{10}–C_{16}	mg/kg	50	-	n/a	n/a	-	-	-	-	-	-	-	n/a	n/a	n/a	n/a
>C_{10}–C_{16} less naphthalene	mg/kg	50	-	n/a	n/a	-	-	-	-	-	120	-	n/a	n/a	n/a	n/a
>C_{16}–C_{34} coarse	mg/kg	100	-	n/a	n/a	-	-	-	-	-	300	-	n/a	n/a	n/a	n/a
>C_{16}–C_{34} fine	mg/kg	100	-	n/a	n/a	-	-	-	-	-	1300	-	n/a	n/a	n/a	n/a
>C_{34}–C_{40} coarse	mg/kg	100	-	n/a	n/a	-	-	-	-	-	2800	-	n/a	n/a	n/a	n/a
>C_{34}–C_{40} fine	mg/kg	100	-	n/a	n/a	-	-	-	-	-	5600	-	n/a	n/a	n/a	n/a
Total TRH (C_6–C_{40})	mg/kg	275	550	n/a	n/a	-	-	-	-	-	-	-	n/a	n/a	n/a	n/a
BTEX																
Benzene	mg/kg	0.5	-	n/a	n/a	0.2	0.2	2	20	-	50–65	-	n/a	n/a	n/a	n/a
Toluene	mg/kg	0.5	-	n/a	n/a	160	160	1600	16,000	-	85–105	-	n/a	n/a	n/a	n/a
Ethylbenzene	mg/kg	0.5	-	n/a	n/a	60	60	600	6000	-	7–125	-	n/a	n/a	n/a	n/a
Xylenes	mg/kg	1	-	n/a	n/a	120	120	1200	12,000	-	105–45	-	n/a	n/a	n/a	n/a
Organochlorine pesticides																
alpha-BHC	µg/kg	1	-	n/a	n/a					-	-	-	n/a	n/a	n/a	n/a
Hexachlorobenzene	µg/kg	1	-	n/a	n/a					-	-	-	n/a	n/a	n/a	n/a
beta-BHC	µg/kg	1	-	n/a	n/a					-	-	-	n/a	n/a	n/a	n/a
gamma-BHC (lindane)	µg/kg	1	0.32	n/a	n/a					-	-	-	n/a	n/a	n/a	n/a
delta-BHC	µg/kg	1	-	n/a	n/a					-	-	-	n/a	n/a	n/a	n/a
Heptachlor	µg/kg	1	-	n/a	n/a					-	-	10	n/a	n/a	n/a	n/a
Aldrin	µg/kg	1	-	n/a	n/a	50 (total)	50 (total)	50 (total)	50 (total)	-	-	-	n/a	n/a	n/a	n/a
Heptachlor epoxide	µg/kg	1	-	n/a	n/a					-	-	-	n/a	n/a	n/a	n/a
trans-Chlordane	µg/kg	1	-	n/a	n/a					-	-	-	n/a	n/a	n/a	n/a
cis-Chlordane	µg/kg	1	-	n/a	n/a					-	-	-	n/a	n/a	n/a	n/a
Chlordane (sum)	µg/kg	0.5	0.5	n/a	n/a					-	-	70	n/a	n/a	n/a	n/a
Oxychlordane	µg/kg	1	-	n/a	n/a					-	-	-	n/a	n/a	n/a	n/a
Endosulfan I	µg/kg	1	-	n/a	n/a					-	-	-	n/a	n/a	n/a	n/a
4,4'-DDE	µg/kg	1	2.2	n/a	n/a					-	-	-	n/a	n/a	n/a	n/a

Analyte	Units	LoR[2]	NAGD[3]	ANZG Marine[4]		Landfill Classifications CT[1,5,6]				Contaminated Sites Guidelines			PFAS NEMP	Asbestos Guidelines (2021)[13]	ASS[14]	Indicators of MBOs[15]
				95%	99%	Class 1	Class 2	Class 3	Class 4	EIL[11]	ESL[10,11]	HIL[11]	99%			
Dieldrin	µg/kg	1	280	n/a	n/a					-	-	-	n/a	n/a	n/a	n/a
Endrin	µg/kg	1	10	n/a	n/a					-	-	20	n/a	n/a	n/a	n/a
Sum aldrin+dieldrin	µg/kg	0.5	-	n/a	n/a					-	-	10	n/a	n/a	n/a	n/a
4,4'-DDD	µg/kg	1	2	n/a	n/a					-	-	-	n/a	n/a	n/a	n/a
Endosulfan II	µg/kg	1	-	n/a	n/a					-	-	-	n/a	n/a	n/a	n/a
Endosulfan (sum)	µg/kg	0.5	-	n/a	n/a					-	-	340	n/a	n/a	n/a	n/a
4,4'-DDT	µg/kg	1	16	n/a	n/a					-	-	-	n/a	n/a	n/a	n/a
Sum of DDD+DDE +DDT	µg/kg	0.5	-	n/a	n/a					-	-	400	n/a	n/a	n/a	n/a
Endosulfan sulfate	µg/kg	1	-	n/a	n/a					-	-	-	n/a	n/a	n/a	n/a
Methoxychlor	µg/kg	1	-	n/a	n/a					-	-	400	n/a	n/a	n/a	n/a
Elutriate organochlorine pesticides																
alpha-BHC	µg/L		n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Hexachlorobenzene	µg/L		n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
beta-BHC	µg/L		n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
gamma-BHC (lindane)	µg/L		n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
delta-BHC	µg/L		n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Heptachlor	µg/L		n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Aldrin	µg/L		n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Heptachlor epoxide	µg/L		n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
trans-Chlordane	µg/L		n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
cis-Chlordane	µg/L		n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Chlordane (sum)	µg/L		n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Oxychlordane	µg/L		n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Endosulfan I	µg/L		n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
4,4'-DDE	µg/L		n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Dieldrin	µg/L		n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Endrin	µg/L		n/a	0.008	0.004	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sum aldrin+dieldrin	µg/L		n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
4,4'-DDD	µg/L		n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Endosulfan II	µg/L		n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Endosulfan (sum)	µg/L		n/a	0.01	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
4,4'-DDT	µg/L		n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sum of DDD+DDE +DDT	µg/L		n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Endosulfan sulfate	µg/L		n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Analyte	Units	LoR[2]	NAGD[3]	ANZG Marine[4]		Landfill Classifications CT[1,5,6]				Contaminated Sites Guidelines			PFAS NEMP	Asbestos Guidelines (2021)[13]	ASS[14]	Indicators of MBOs[15]
				95%	99%	Class 1	Class 2	Class 3	Class 4	EIL[11]	ESL[10,11]	HIL[11]	99%			
Methoxychlor	µg/L		n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Per- and polyfluoroalkyl substances (PFAS)																
4:2 Fluorotelomer sulfonic acid	mg/kg	0.0001	-	n/a	n/a	-	-	-	-	-	-	-	-	n/a	n/a	n/a
6:2 Fluorotelomer sulfonic acid	mg/kg	0.0001	-	n/a	n/a	-	-	-	-	-	-	-	-	n/a	n/a	n/a
8:2 Fluorotelomer sulfonic acid	mg/kg	0.0001	-	n/a	n/a	-	-	-	-	-	-	-	-	n/a	n/a	n/a
10:2 Fluorotelomer sulfonic acid	mg/kg	0.0002	-	n/a	n/a	-	-	-	-	-	-	-	-	n/a	n/a	n/a
4:2 Fluorotelomer sulfonic acid	mg/kg	0.0002	-	n/a	n/a	-	-	-	-	-	-	-	-	n/a	n/a	n/a
PFBS	mg/kg	0.0001	-	n/a	n/a	-	-	-	-	-	-	-	-	n/a	n/a	n/a
PFHxS	mg/kg	0.0001	-	n/a	n/a	-	-	-	-	-	-	-	-	n/a	n/a	n/a
PFOS	mg/kg	0.0001	-	n/a	n/a	-	-	-	-	-	-	-	-	n/a	n/a	n/a
PFBA	mg/kg	0.0002	-	n/a	n/a	-	-	-	-	-	-	-	-	n/a	n/a	n/a
PFPeA	mg/kg	0.0002	-	n/a	n/a	-	-	-	-	-	-	-	-	n/a	n/a	n/a
PFHxA	mg/kg	0.0001	-	n/a	n/a	-	-	-	-	-	-	-	-	n/a	n/a	n/a
PFHpA	mg/kg	0.0001	-	n/a	n/a	-	-	-	-	-	-	-	-	n/a	n/a	n/a
PFOA	mg/kg	0.0001	-	n/a	n/a	-	-	-	-	-	-	-	-	n/a	n/a	n/a
PFHxS+PFOS (sum)	mg/kg	0.00002	-	n/a	n/a	-	-	-	-	-	-	-	-	n/a	n/a	n/a
PFAS (sum)	mg/kg	0.00002	-	n/a	n/a	-	-	-	-	-	-	-	-	n/a	n/a	n/a
Elutriate per- and polyfluoroalkyl substances (PFAS)													-			
4:2 Fluorotelomer sulfonic acid	µg/L	0.001	n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-	n/a	n/a	n/a
6:2 Fluorotelomer sulfonic acid	µg/L	0.001	n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-	n/a	n/a	n/a
8:2 Fluorotelomer sulfonic acid	µg/L	0.001	n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-	n/a	n/a	n/a
10:2 Fluorotelomer sulfonic acid	µg/L	0.001	n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-	n/a	n/a	n/a
4:2 Fluorotelomer sulfonic acid	µg/L	0.001	n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-	n/a	n/a	n/a
PFBS	µg/L	0.0005	n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-	n/a	n/a	n/a
PFHxS	µg/L	0.0005	n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.00023	n/a	n/a	n/a
PFOS	µg/L	0.0003	n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-	n/a	n/a	n/a
PFBA	µg/L	0.0005	n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-	n/a	n/a	n/a
PFPeA	µg/L	0.0005	n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-	n/a	n/a	n/a

Analyte	Units	LoR[2]	NAGD[3]	ANZG Marine[4]		Landfill Classifications CT[1,5,6]				Contaminated Sites Guidelines			PFAS NEMP	Asbestos Guidelines (2021)[13]	ASS[14]	Indicators of MBOs[15]
				95%	99%	Class 1	Class 2	Class 3	Class 4	EIL[11]	ESL[10,11]	HIL[11]	99%			
PFHxA	µg/L	0.0005	n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-	n/a	n/a	n/a
PFHpA	µg/L	0.0005	n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-	n/a	n/a	n/a
PFOA	µg/L	0.0003	n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	19	n/a	n/a	n/a
PFHxS+PFOS (sum)	µg/L	0.001	n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-	n/a	n/a	n/a
PFAS (sum)	µg/L	0.001	n/a	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-	n/a	n/a	n/a
Other organic analytes																
Polychlorinated biphenyls (total)	mg/kg	0.005	0.023	n/a	n/a	50	50	50	50	-	-	1	n/a	n/a	n/a	n/a
Antifoulants[8]																n/a
Diuron	mg/kg	-	-	n/a	n/a	-	-	-	-	-	-	-	n/a	n/a	n/a	n/a
Zinc pyrithione	mg/kg	-	-	n/a	n/a	-	-	-	-	-	-	-	n/a	n/a	n/a	n/a
Irgarol	mg/kg	-	-	n/a	n/a	-	-	-	-	-	-	-	n/a	n/a	n/a	n/a
Chlorothalonil	mg/kg	-	-	n/a	n/a	-	-	-	-	-	-	-	n/a	n/a	n/a	n/a
Dichlofluanid	mg/kg	-	-	n/a	n/a	-	-	-	-	-	-	-	n/a	n/a	n/a	n/a
Other																n/a
SCr – chromium reducible	%	0.03	-	-	-	-	-	-	-	-	-	-	-	n/a	0.03	n/a
Acid volatile sulfide	%	0.0001	-	-	-	-	-	-	-	-	-	-	-	n/a	n/a	0.01
Asbestos	% w/w	0.001	-	-	-	-	-	-	-	-	-	-	-	0.02	n/a	n/a

Notes

1. **"–" = guideline value not published in available guidelines; n/a = not applicable, BTEX = benzene, toluene, ethylbenzene, xylene; CT = contaminant threshold; DBT = dibutyltin; DDD = dichlorodiphenyldichloroethane; DDE = dichlorodiphenyldichloroethylene; DDT = dichlorodiphenyltrichloroethane; MBT = monobutyltin; PAHs = polycyclic aromatic hydrocarbons; PFAS = per- and polyfluoroalkyl substances; PFBA = perfluorobutanoic acid; PFBS = perfluorobutanesulfonic acid; PFHpA = perfluoroheptanoic acid; PFHxA = perfluorohexanoic acid; PFHxS = perfluorohexanesulfonic acid; PFOA = perfluorooctanoic acid; PFOS = perfluorooctanesulfonic acid; PFPeA = perfluoropentanoic acid; MCPP = methylchlorophenoxypropionic acid; PFOS = perfluorooctane sulfonate or perfluorooctane sulfonic acid; TBT = tributyltin; TPHs = total petroleum hydrocarbons, TRHs = total recoverable hydrocarbons.**
2. **Laboratory limits of reporting (LoR) are based on those achieved by ALS laboratory.**
3. **National Assessment Guidelines for Dredging (NAGD) Screening Levels (CA 2009).**
4. **ANZG (2018) marine water and sediment quality guidelines. Guidelines are default guideline values (DGVs) for toxicants in marine waters (see Annex A).**
5. **Contaminant thresholds (CT) from DWER (2019) will be used to determine waste classification and appropriate landfill class for disposal (Class 1 [Inert Landfill], Class 2 [Putrescible Landfill], Class 3 [Putrescible Landfill], Class 4 [Secure Landfill] and Class 5 [Intractable Landfill]). Should CT values be exceeded, a leach test will be undertaken to assess the leachate concentrations against guideline values (Table 4 in DWER 2019). Results of the leach test will determine appropriate disposal method.**
6. **OCPs, PCBs and PAHs are assessed by using concentration criteria (CL; refer to Table 5 in DWER [2019]). No leaching analysis is required for these contaminants (DWER 2019).**
7. **ANZECC/ARMCANZ (2000) DGVs for PC stressors for estuaries of south-west Australia (slightly disturbed ecosystems) were applied to ammonium, nitrate+nitrite, total nitrogen, filterable reactive phosphorus and total phosphorus as majority of analytes were not updated in ANZG (2018) and no Integrated Marine and Coastal Regionalisation of Australia zone is available for estuaries.**
8. **Antifoulant suite and LoRs need to be confirmed based on laboratory capability.**
9. **As per EPA (2016) the 95% species protection DGV will be applied to cobalt assessment instead.**
10. **Coarse and fine guidelines for BTEX and PAHs (NEPM 2013)**
11. **Assumes NEMP (2013) guidelines for public open space.**
12. **Ammonia is included as both a physical-chemical stressor and a toxicant.**
13. **Assumes DoH (2021) guideline for parks.**
14. **Action criteria derived from DER (2015a).**
15. **Derived from Table B.1.**

Table B.3. Leachable concentration and concentration limit values for landfill waste classification

Contaminant	Class 1		Class 2		Class 3		Class 4	
	Leachable concentration ASLP (mg/L)	CL (mg/kg)	Leachable concentration ASLP (mg/L)	CL (mg/kg)	Leachable concentration ASLP (mg/L)	CL (mg/kg)	Leachable concentration ASLP (mg/L)	CL (mg/kg)
Metals								
Aluminium	-	5% by weight	-	5% by weight	-	10% by weight	-	20% by weight
Arsenic	0.5	500	0.5	500	5	5000	50	20,000
Barium	-	5% by weight	-	5% by weight	-	10% by weight	-	20% by weight
Beryllium	0.1	100	0.1	100	1	1000	10	4000
Boron	-	5% by weight	-	5% by weight	-	10% by weight	-	20% by weight
Cadmium	0.1	100	0.1	100	1	1000	10	4000
Chromium III	-	-	-	-	-	-	-	-
Chromium VI	0.5	500	0.5	500	5	5000	50	2000
Cobalt	-	5% by weight	-	5% by weight	-	10% by weight	-	20% by weight
Copper	-	5% by weight	-	5% by weight	-	10% by weight	-	20% by weight
Iron	-	-	-	-	-	-	-	-
Lead	0.1	1500	0.1	1500	1	15,000	10	60,000
Manganese	-	5% by weight	-	5% by weight	-	10% by weight	-	20% by weight
Mercury	0.01	75	0.01	75	0.1	750	1	3000
Molybdenum	0.5	1000	0.5	1000	5	10,000	50	40,000
Nickel	0.2	3000	0.2	3000	2	30,000	20	120,000
Selenium	0.5	50	0.5	50	5	500	50	2000
Silver	1	180	1	180	10	1800	100	7200

Contaminant	Class 1		Class 2		Class 3		Class 4	
	Leachable concentration ASLP (mg/L)	CL (mg/kg)	Leachable concentration ASLP (mg/L)	CL (mg/kg)	Leachable concentration ASLP (mg/L)	CL (mg/kg)	Leachable concentration ASLP (mg/L)	CL (mg/kg)
Vanadium	-	5% by weight	-	5% by weight	-	10% by weight	-	20% by weight
Zinc	-	5% by weight	-	5% by weight	-	10% by weight	-	20% by weight
Hydrocarbons								
Benzene	0.01	18	0.01	18	0.1	180	1	720
Toluene	8	518	8	518	80	5180	800	-
Ethylbenzene	3	1080	3	1080	30	10,800	300	-
Xylenes (total)	6	1800	6	1800	60	18,000	600	-
C_6-C_9	-	2800	-	2800	-	28,000	-	112,000
>C_{16}–C_{35} (aromatics)	-	450	-	450	-	4500	-	18,000
>C_{16}–C_{35} (aliphatics)	-	28,000	-	28,000	-	280,000	-	-
PAHs (total)	-	100	-	100	-	1000	-	4000
Benzo(a)pyrene	0.0001	5	0.0001	5	0.001	50	0.01	200
Chlorinated organics								
Polychlorinated biphenyls	-	50	-	50	-	50	-	50

Notes:

1. **Data sourced from Table 4 of DWER (2019)**
2. **"-" = guideline value not available, "ASLP" = Australian Standard Leaching Procedures, "CL" = Concentration Limit, "PAH" = polycyclic aromatic hydrocarbons**
3. **Only analytes from Table B.2. with applicable ASLP and CL values are listed here**

Data Quality Assurance/ Quality Control (QA/QC)

The precision of the sediment analyses will be determined by quantifying the differences between the concentrations of analytes in the QA/QC samples, using the methods outlined in the NAGD (CA 2009). The relative percent difference (RPD) will be calculated for the analyte concentrations in the split samples (both inter-laboratory and intra-laboratory splits) and the relative standard deviation (RSD) will be calculated for analyte concentrations in the triplicate samples.

The RPD will be calculated as follows:

$$RPD\ (\%) = \frac{(difference\ between\ split\ samples\ x\ 100)}{(average\ of\ split\ samples)}$$

The acceptable RPD range of split samples depends upon the concentration levels detected relative to the LoR as follows (Australian Department of the Environment, pers. comm. 12 August 2014):

- 0–100% RPD when the average concentration is <5 times the LoR
- 0–75% RPD when the average concentration is 5 to 10 times the LoR
- 0–50% RPD when the average concentration is >10 times the LoR.

If the RPD for a measured analyte falls outside of these limits, the value of the measured analyte will be flagged as an estimate rather than a precise value (CA 2009).

The RSD will be calculated as follows:

$$RSD\ (\%) = \frac{(standard\ deviation\ of\ triplicate\ samples)x\ 100}{(average\ of\ triplicate\ samples)}$$

The triplicate samples should agree within an RSD of ±50%. RSDs greater than 50% may indicate that the sediments are heterogeneous or greatly differ in grain size (CA 2009). RPD and RSD will only be calculated if all QA/QC sample concentrations are above the LoR. If one or more of the analyte concentrations are below the LoR, the individual concentrations will be compared to assess the magnitude of the differences between them.

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USEPA (2022) ProUCL version 5.2. Available at <https://www.epa.gov/land-research/proucl-software> United States Environmental Protection Agency

Annex B Laboratory Reports

B.1 MPL Laboratory Reports

Envirolab Services (WA) Pty Ltd trading as MPL Laboratories
ABN 53 140 099 207
16-18 Hayden Court Myaree WA 6154
ph +61 8 9317 2505
lab@mpl.com.au
www.mpl.com.au

Certificate of Analysis PGD0893

Client Details

Client	BMT Commercial Australia Pty Ltd (WA)
Contact	Sophie Cochrane
Address	PO Box 462, WEMBLEY, WA, 6913

Sample Details

Your Reference	PTA Ferry Expansion Sampling
Number of Samples	21 Soil, 2 Water
Date Samples Received	10/04/2025
Date Instructions Received	20/05/2025

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 Final Results Expected	04/06/2025
Date of Reissue	28/05/2025 - This report supercedes previous report, see amendment history for details

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Authorisation Details

Asbestos Approved By	Analysed by Asbestos Approved Analyst: Lalanee Rupasinghe Authorised by Asbestos Approved Signatory: Lalanee Rupasinghe
Results Approved By	Ben Carpenter, Metals Technician Hien Luong, Chemist - FAS Jenny Xin He, Chemist Lalanee Rupasinghe, Asbestos Analyst Lien Tang, Assistant Operations Manager Lucas Yii, Inorganics Team Leader Michael Kubiak, Lab Manager Michael Mowle, Development Chemist - Inorganics and Metals Sean McAlary, Senior Chemist Stacey Hawkins, ASS/AMD Supervisor Travis Carey, Organics Supervisor Varsha Ho Wing, Inorganics and Metals Supervisor
Laboratory Manager	Michael Kubiak

Report Amendment History

Revision	Reason for Amendment
R-01	Additional analysis requested 20.05.25.

Certificate of Analysis PGD0893

Samples in this Report

Envirolab ID	Sample ID	Matrix	Date Sampled	Date Received
PGD0893-01	EQ1	Soil	10/04/2025	20/05/2025
PGD0893-02	EQ2_1	Soil	10/04/2025	20/05/2025
PGD0893-03	EQ2_2	Soil	10/04/2025	20/05/2025
PGD0893-04	EQ3_3	Soil	10/04/2025	20/05/2025
PGD0893-05	EQ3	Soil	10/04/2025	20/05/2025
PGD0893-06	MB1_a	Soil	10/04/2025	20/05/2025
PGD0893-07	MB1_b	Soil	10/04/2025	20/05/2025
PGD0893-08	MB2	Soil	10/04/2025	20/05/2025
PGD0893-09	MB3	Soil	10/04/2025	20/05/2025
PGD0893-10	MB4	Soil	10/04/2025	20/05/2025
PGD0893-11	MB5	Soil	10/04/2025	20/05/2025
PGD0893-12	MB6	Soil	10/04/2025	20/05/2025
PGD0893-13	AP1	Soil	10/04/2025	20/05/2025
PGD0893-14	AP2	Soil	10/04/2025	20/05/2025
PGD0893-15	AP3	Soil	10/04/2025	20/05/2025
PGD0893-16	CB1_1	Soil	10/04/2025	20/05/2025
PGD0893-17	CB1_2	Soil	10/04/2025	20/05/2025
PGD0893-18	CB1_3	Soil	10/04/2025	20/05/2025
PGD0893-19	CB2	Soil	10/04/2025	20/05/2025
PGD0893-20	CB3	Soil	10/04/2025	20/05/2025
PGD0893-21	Rinsate	Water	10/04/2025	20/05/2025
PGD0893-22	Trip blank	Soil	10/04/2025	20/05/2025
PGD0893-23	Elutriate blank	Water	10/04/2025	20/05/2025

Sample Comments

EQ3_3	Sample labelled 'EQ2_3'.
Rinsate	Sub-sampled for v-TRH + BTEXN from glass bottle.

Volatile TRH and BTEX (Water)

Envirolab ID	Units	PQL	PGD0893-21
Your Reference			Rinsate
Date Sampled			10/04/2025
TRH C6-C9	µg/L	10	<10
TRH C6-C10	µg/L	10	<10
TRH C6-C10 less BTEX (F1)	µg/L	10	<10
Methyl tert butyl ether (MTBE)	µg/L	1.0	<1.0
Benzene	µg/L	1.0	<1.0
Toluene	µg/L	1.0	<1.0
Ethylbenzene	µg/L	1.0	<1.0
meta+para Xylene	µg/L	2.0	<2.0
ortho-Xylene	µg/L	1.0	<1.0
Total +ve Xylenes	µg/L	1.0	<1.0
Naphthalene (value used in F2 calc)	µg/L	1.0	<1.0
Total +ve BTEX	µg/L	1.0	<1.0
Surrogate Dibromofluoromethane	%		*117*
Surrogate Toluene-D8	%		*96.5*
Surrogate 4-Bromofluorobenzene	%		*108*

Volatile TRH and BTEX - NAGD (Soil)

Envirolab ID	Units	PQL	PGD0893-01	PGD0893-02	PGD0893-03	PGD0893-04	PGD0893-05
Your Reference			EQ1	EQ2_1	EQ2_2	EQ3_3	EQ3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
TRH C6-C9	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 less BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25
Benzene	mg/kg	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Toluene	mg/kg	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Ethylbenzene	mg/kg	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Total Xylene	mg/kg	0.60	<0.60	<0.60	<0.60	<0.60	<0.60
Surrogate aaa-Trifluorotoluene	%		*79.4*	*83.1*	*85.7*	*87.7*	*80.8*

Envirolab ID	Units	PQL	PGD0893-06	PGD0893-07	PGD0893-08	PGD0893-09	PGD0893-10
Your Reference			MB1_a	MB1_b	MB2	MB3	MB4
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
TRH C6-C9	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 less BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25
Benzene	mg/kg	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Toluene	mg/kg	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Ethylbenzene	mg/kg	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Total Xylene	mg/kg	0.60	<0.60	<0.60	<0.60	<0.60	<0.60
Surrogate aaa-Trifluorotoluene	%		*85.3*	*90.6*	*71.1*	*75.9*	*89.1*

Envirolab ID	Units	PQL	PGD0893-11	PGD0893-12	PGD0893-13	PGD0893-14	PGD0893-15
Your Reference			MB5	MB6	AP1	AP2	AP3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
TRH C6-C9	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 less BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25
Benzene	mg/kg	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Toluene	mg/kg	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Ethylbenzene	mg/kg	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Total Xylene	mg/kg	0.60	<0.60	<0.60	<0.60	<0.60	<0.60
Surrogate aaa-Trifluorotoluene	%		*70.3*	*86.7*	*89.3*	*71.6*	*84.5*

Envirolab ID	Units	PQL	PGD0893-16	PGD0893-17	PGD0893-18	PGD0893-19	PGD0893-20
Your Reference			CB1_1	CB1_2	CB1_3	CB2	CB3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
TRH C6-C9	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 less BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25
Benzene	mg/kg	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Toluene	mg/kg	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Ethylbenzene	mg/kg	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Total Xylene	mg/kg	0.60	<0.60	<0.60	<0.60	<0.60	<0.60
Surrogate aaa-Trifluorotoluene	%		*73.3*	*75.5*	*76.6*	*72.1*	*78.7*

Envirolab ID	Units	PQL	PGD0893-22
Your Reference			Trip blank
Date Sampled			10/04/2025
TRH C6-C9	mg/kg	25	<25

Volatile TRH and BTEX - NAGD (Soil)

Envirolab ID	Units	PQL	PGD0893-22
Your Reference			Trip blank
Date Sampled			10/04/2025
TRH C6-C10	mg/kg	25	<25
TRH C6-C10 less BTEX (F1)	mg/kg	25	<25
Benzene	mg/kg	0.20	<0.20
Toluene	mg/kg	0.20	<0.20
Ethylbenzene	mg/kg	0.20	<0.20
Total Xylene	mg/kg	0.60	<0.60
Surrogate aaa-Trifluorotoluene	%		*87.0*

Semi-volatile TRH (Water)

Envirolab ID	Units	PQL	PGD0893-21
Your Reference			Rinsate
Date Sampled			10/04/2025
TRH C10-C14	µg/L	50	<50
TRH C15-C28	µg/L	100	160
TRH C29-C36	µg/L	100	<100
Total +ve TRH C10-C36	µg/L	50	160
TRH >C10-C16	µg/L	50	99
TRH >C10-C16 less Naphthalene F2	µg/L	50	99
TRH >C16-C34 (F3)	µg/L	100	<100
TRH >C34-C40 (F4)	µg/L	100	<100
Total +ve TRH >C10-C40	µg/L	50	99
Surrogate o-Terphenyl	%		*93.3*

Semi-volatile TRH - NAGD (Soil)

Envirolab ID	Units	PQL	PGD0893-01	PGD0893-02	PGD0893-03	PGD0893-04	PGD0893-05
Your Reference			EQ1	EQ2_1	EQ2_2	EQ3_3	EQ3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
TRH C10-C14	mg/kg	25	<25	<25	<25	<25	<25
TRH C15-C28	mg/kg	25	31	<25	<25	<25	<25
TRH C29-C36	mg/kg	25	96	<25	<25	<25	39
TRH >C10-C16	mg/kg	25	<25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	25	99	<25	<25	<25	40
TRH >C34-C40 (F4)	mg/kg	25	39	<25	<25	<25	<25

Envirolab ID	Units	PQL	PGD0893-06	PGD0893-07	PGD0893-08	PGD0893-09	PGD0893-10
Your Reference			MB1_a	MB1_b	MB2	MB3	MB4
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
TRH C10-C14	mg/kg	25	<25	<25	30	<25	<25
TRH C15-C28	mg/kg	25	<25	<25	85	<25	<25
TRH C29-C36	mg/kg	25	<25	<25	140	<25	<25
TRH >C10-C16	mg/kg	25	<25	<25	47	<25	<25
TRH >C16-C34 (F3)	mg/kg	25	<25	<25	150	27	<25
TRH >C34-C40 (F4)	mg/kg	25	<25	<25	52	<25	<25

Envirolab ID	Units	PQL	PGD0893-11	PGD0893-12	PGD0893-13	PGD0893-14	PGD0893-15
Your Reference			MB5	MB6	AP1	AP2	AP3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
TRH C10-C14	mg/kg	25	<25	<25	<25	<25	<25
TRH C15-C28	mg/kg	25	<25	<25	<25	<25	<25
TRH C29-C36	mg/kg	25	46	<25	<25	<25	<25
TRH >C10-C16	mg/kg	25	<25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	25	53	<25	<25	<25	<25
TRH >C34-C40 (F4)	mg/kg	25	<25	<25	<25	<25	<25

Envirolab ID	Units	PQL	PGD0893-16	PGD0893-17	PGD0893-18	PGD0893-19	PGD0893-20
Your Reference			CB1_1	CB1_2	CB1_3	CB2	CB3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
TRH C10-C14	mg/kg	25	<25	<25	<25	<25	<25
TRH C15-C28	mg/kg	25	<25	<25	<25	<25	<25
TRH C29-C36	mg/kg	25	<25	27	<25	<25	<25
TRH >C10-C16	mg/kg	25	<25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	25	36	32	<25	26	<25
TRH >C34-C40 (F4)	mg/kg	25	<25	<25	<25	<25	<25

Envirolab ID	Units	PQL	PGD0893-22
Your Reference			Trip blank
Date Sampled			10/04/2025
TRH C10-C14	mg/kg	25	<25
TRH C15-C28	mg/kg	25	<25
TRH C29-C36	mg/kg	25	<25
TRH >C10-C16	mg/kg	25	<25
TRH >C16-C34 (F3)	mg/kg	25	<25
TRH >C34-C40 (F4)	mg/kg	25	<25

Polycyclic Aromatic Hydrocarbons (Water)

Envirolab ID	Units	PQL	PGD0893-21
Your Reference			Rinsate
Date Sampled			10/04/2025
Naphthalene	µg/L	0.10	<0.10
Acenaphthylene	µg/L	0.10	<0.10
Acenaphthene	µg/L	0.10	<0.10
Fluorene	µg/L	0.10	<0.10
Phenanthrene	µg/L	0.10	<0.10
Anthracene	µg/L	0.10	<0.10
Fluoranthene	µg/L	0.10	<0.10
Pyrene	µg/L	0.10	<0.10
Benzo(a)anthracene	µg/L	0.10	<0.10
Chrysene	µg/L	0.10	<0.10
Benzo(b,j,k)fluoranthene	µg/L	0.20	<0.20
Benzo(a)pyrene	µg/L	0.10	<0.10
Indeno(1,2,3-c,d)pyrene	µg/L	0.10	<0.10
Dibenzo(a,h)anthracene	µg/L	0.10	<0.10
Benzo(g,h,i)perylene	µg/L	0.10	<0.10
Total +ve PAH	µg/L	0.10	<0.10
Surrogate p-Terphenyl-D14	%		*117*

Polycyclic Aromatic Hydrocarbons - NAGD (Soil)

Envirolab ID	Units	PQL	PGD0893-01	PGD0893-02	PGD0893-03	PGD0893-04	PGD0893-05
Your Reference			EQ1	EQ2_1	EQ2_2	EQ3_3	EQ3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Naphthalene	µg/kg	5.0	11	<5.0	<5.0	<5.0	6.7
2-Methylnaphthalene	µg/kg	5.0	8.8	<5.0	<5.0	5.2	5.6
Acenaphthylene	µg/kg	5.0	46	12	14	12	20
Acenaphthene	µg/kg	5.0	<5.0	<5.0	<5.0	8.2	<5.0
Fluorene	µg/kg	5.0	7.2	<5.0	<5.0	14	<5.0
Phenanthrene	µg/kg	5.0	80	29	33	270	46
Anthracene	µg/kg	5.0	34	10	12	51	17
Fluoranthene	µg/kg	5.0	540	150	160	350	210
Pyrene	µg/kg	5.0	660	180	190	330	260
Benzo(a)anthracene	µg/kg	5.0	270	65	68	150	100
Chrysene	µg/kg	5.0	270	66	<100	130	84
Benzo(b,j,k)fluoranthene	µg/kg	10	670	<200	<200	250	240
Benzo(e)pyrene	µg/kg	5.0	300	77	73	100	100
Benzo(a)pyrene	µg/kg	5.0	460	130	120	170	170
Perylene	µg/kg	5.0	120	34	39	52	50
Indeno(1,2,3-c,d)pyrene	µg/kg	5.0	320	<100 [13]	<100 [13]	110	120
Dibenzo(a,h)anthracene	µg/kg	5.0	<100 [13]	<100 [13]	<100 [13]	<100 [13]	<100 [13]
Benzo(g,h,i)perylene	µg/kg	5.0	310	<100 [13]	<100 [13]	<100 [13]	110
Coronene	µg/kg	5.0	130	<100 [13]	<100 [13]	<100 [13]	<100 [13]
Surrogate p-Terphenyl-D14	%		*63.9*	*89.6*	*## [7]*	*## [7]*	*## [7]*

Envirolab ID	Units	PQL	PGD0893-06	PGD0893-07	PGD0893-08	PGD0893-09	PGD0893-10
Your Reference			MB1_a	MB1_b	MB2	MB3	MB4
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Naphthalene	µg/kg	5.0	<5.0	<5.0	<5.0	9.3	<5.0
2-Methylnaphthalene	µg/kg	5.0	<5.0	<5.0	<5.0	7.7	<5.0
Acenaphthylene	µg/kg	5.0	<5.0	<5.0	20	23	<5.0
Acenaphthene	µg/kg	5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Fluorene	µg/kg	5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Phenanthrene	µg/kg	5.0	<5.0	<5.0	42	43	<5.0
Anthracene	µg/kg	5.0	<5.0	<5.0	15	16	<5.0
Fluoranthene	µg/kg	5.0	<5.0	10	150	190	6.3
Pyrene	µg/kg	5.0	<5.0	12	160	230	7.0
Benzo(a)anthracene	µg/kg	5.0	<5.0	5.4	86	100	<5.0
Chrysene	µg/kg	5.0	<5.0	<5.0	70	93	<5.0
Benzo(b,j,k)fluoranthene	µg/kg	10	<10	16	230	280	<10
Benzo(e)pyrene	µg/kg	5.0	<5.0	5.8	85	110	<5.0
Benzo(a)pyrene	µg/kg	5.0	<5.0	11	150	150	6.7
Perylene	µg/kg	5.0	<5.0	<5.0	37	37	<5.0
Indeno(1,2,3-c,d)pyrene	µg/kg	5.0	<100 [13]	<100 [13]	120	110	<100 [13]
Dibenzo(a,h)anthracene	µg/kg	5.0	<100 [13]	<100 [13]	<100 [13]	<100 [13]	<100 [13]
Benzo(g,h,i)perylene	µg/kg	5.0	<100 [13]	<100 [13]	120	110	<100 [13]
Coronene	µg/kg	5.0	<100 [13]	<100 [13]	<100 [13]	<100 [13]	<100 [13]
Surrogate p-Terphenyl-D14	%		*69.2*	*75.4*	*66.5*	*98.7*	*66.4*

Polycyclic Aromatic Hydrocarbons - NAGD (Soil)

Envirolab ID	Units	PQL	PGD0893-11	PGD0893-12	PGD0893-13	PGD0893-14	PGD0893-15
Your Reference			MB5	MB6	AP1	AP2	AP3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Naphthalene	µg/kg	5.0	10	<5.0	<5.0	<5.0	<5.0
2-Methylnaphthalene	µg/kg	5.0	7.3	<5.0	<5.0	<5.0	<5.0
Acenaphthylene	µg/kg	5.0	25	<5.0	<5.0	5.1	<5.0
Acenaphthene	µg/kg	5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Fluorene	µg/kg	5.0	5.1	<5.0	<5.0	<5.0	<5.0
Phenanthrene	µg/kg	5.0	46	<5.0	<5.0	8.4	<5.0
Anthracene	µg/kg	5.0	22	<5.0	<5.0	5.5	<5.0
Fluoranthene	µg/kg	5.0	270	7.9	<5.0	43	<5.0
Pyrene	µg/kg	5.0	360	9.5	<5.0	49	<5.0
Benzo(a)anthracene	µg/kg	5.0	100	<5.0	<5.0	20	<5.0
Chrysene	µg/kg	5.0	94	<5.0	<5.0	18	<5.0
Benzo(b,j,k)fluoranthene	µg/kg	10	340	13	<10	57	<10
Benzo(e)pyrene	µg/kg	5.0	120	<5.0	<5.0	21	<5.0
Benzo(a)pyrene	µg/kg	5.0	220	8.1	<5.0	33	<5.0
Perylene	µg/kg	5.0	47	<5.0	<5.0	17	<5.0
Indeno(1,2,3-c,d)pyrene	µg/kg	5.0	160	<100 [13]	<100 [13]	<100 [13]	<100 [13]
Dibenzo(a,h)anthracene	µg/kg	5.0	<100 [13]	<100 [13]	<100 [13]	<100 [13]	<100 [13]
Benzo(g,h,i)perylene	µg/kg	5.0	150	<100 [13]	<100 [13]	<100 [13]	<100 [13]
Coronene	µg/kg	5.0	<100 [13]	<100 [13]	<100 [13]	<100 [13]	<100 [13]
Surrogate p-Terphenyl-D14	%		*74.1*	*## [7]*	*## [7]*	*## [7]*	*## [7]*

Envirolab ID	Units	PQL	PGD0893-16	PGD0893-17	PGD0893-18	PGD0893-19	PGD0893-20
Your Reference			CB1_1	CB1_2	CB1_3	CB2	CB3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Naphthalene	µg/kg	5.0	<5.0	<5.0	<5.0	5.8	<5.0
2-Methylnaphthalene	µg/kg	5.0	<5.0	6.6	<5.0	<5.0	<5.0
Acenaphthylene	µg/kg	5.0	9.5	8.7	<5.0	8.5	5.7
Acenaphthene	µg/kg	5.0	<5.0	6.9	<5.0	<5.0	<5.0
Fluorene	µg/kg	5.0	<5.0	7.9	<5.0	<5.0	<5.0
Phenanthrene	µg/kg	5.0	22	100	6.5	13	5.0
Anthracene	µg/kg	5.0	10	29	<5.0	7.3	<5.0
Fluoranthene	µg/kg	5.0	82	280	27	59	24
Pyrene	µg/kg	5.0	85	270	36	72	28
Benzo(a)anthracene	µg/kg	5.0	46	100	15	33	13
Chrysene	µg/kg	5.0	38	93	14	26	15
Benzo(b,j,k)fluoranthene	µg/kg	10	100	210	44	88	36
Benzo(e)pyrene	µg/kg	5.0	39	75	18	35	16
Benzo(a)pyrene	µg/kg	5.0	64	140	30	58	25
Perylene	µg/kg	5.0	21	38	11	15	5.5
Indeno(1,2,3-c,d)pyrene	µg/kg	5.0	<100 [13]	<100 [13]	<100 [13]	<100 [13]	17
Dibenzo(a,h)anthracene	µg/kg	5.0	<100 [13]	<100 [13]	<100 [13]	<100 [13]	<5.0
Benzo(g,h,i)perylene	µg/kg	5.0	<100 [13]	<100 [13]	<100 [13]	<100 [13]	15
Coronene	µg/kg	5.0	<100 [13]	<100 [13]	<100 [13]	<100 [13]	6.7
Surrogate p-Terphenyl-D14	%		*## [7]*	*60.3*	*## [7]*	*62.1*	*97.3*

Polycyclic Aromatic Hydrocarbons - NAGD (Soil)

Envirolab ID	Units	PQL	PGD0893-22
Your Reference			Trip blank
Date Sampled			10/04/2025
Naphthalene	µg/kg	5.0	<5.0
2-Methylnaphthalene	µg/kg	5.0	<5.0
Acenaphthylene	µg/kg	5.0	<5.0
Acenaphthene	µg/kg	5.0	<5.0
Fluorene	µg/kg	5.0	<5.0
Phenanthrene	µg/kg	5.0	<5.0
Anthracene	µg/kg	5.0	<5.0
Fluoranthene	µg/kg	5.0	<5.0
Pyrene	µg/kg	5.0	<5.0
Benzo(a)anthracene	µg/kg	5.0	<5.0
Chrysene	µg/kg	5.0	<5.0
Benzo(b,j,k)fluoranthene	µg/kg	10	<10
Benzo(e)pyrene	µg/kg	5.0	<5.0
Benzo(a)pyrene	µg/kg	5.0	<5.0
Perylene	µg/kg	5.0	<5.0
Indeno(1,2,3-c,d)pyrene	µg/kg	5.0	<5.0
Dibenzo(a,h)anthracene	µg/kg	5.0	<5.0
Benzo(g,h,i)perylene	µg/kg	5.0	<5.0
Coronene	µg/kg	5.0	<5.0
Surrogate p-Terphenyl-D14	%		*131*

Organochlorine Pesticides (Soil)

Envirolab ID	Units	PQL	PGD0893-01	PGD0893-02	PGD0893-03	PGD0893-04	PGD0893-05
Your Reference			EQ1	EQ2_1	EQ2_2	EQ3_3	EQ3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Toxaphene	mg/kg	2.0	<10 [13]	<10 [13]	<10 [13]	<10 [13]	<10 [13]
Surrogate p-Terphenyl-D14	%		*85.1*	*97.4*	*91.3*	*92.9*	*91.9*

Envirolab ID	Units	PQL	PGD0893-06	PGD0893-07	PGD0893-08	PGD0893-09	PGD0893-10
Your Reference			MB1_a	MB1_b	MB2	MB3	MB4
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Toxaphene	mg/kg	2.0	<10 [13]	<10 [13]	<10 [13]	<10 [13]	<10 [13]
Surrogate p-Terphenyl-D14	%		*96.9*	*101*	*108*	*103*	*103*

Envirolab ID	Units	PQL	PGD0893-11	PGD0893-12	PGD0893-13	PGD0893-14	PGD0893-15
Your Reference			MB5	MB6	AP1	AP2	AP3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Toxaphene	mg/kg	2.0	<10 [13]	<10 [13]	<10 [13]	<10 [13]	<10 [13]
Surrogate p-Terphenyl-D14	%		*105*	*99.1*	*89.0*	*93.6*	*89.2*

Envirolab ID	Units	PQL	PGD0893-16	PGD0893-17	PGD0893-18	PGD0893-19	PGD0893-20
Your Reference			CB1_1	CB1_2	CB1_3	CB2	CB3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Toxaphene	mg/kg	2.0	<10 [13]	<10 [13]	<10 [13]	<10 [13]	<10 [13]
Surrogate p-Terphenyl-D14	%		*100*	*88.4*	*105*	*106*	*100*

Organochlorine Pesticides (Water)

Envirolab ID	Units	PQL	PGD0893-21
Your Reference			Rinsate
Date Sampled			10/04/2025
Toxaphene	µg/L	1.0	<1.0
alpha-BHC	µg/L	0.20	<0.20
Hexachlorobenzene	µg/L	0.20	<0.20
beta-BHC	µg/L	0.20	<0.20
gamma-BHC	µg/L	0.20	<0.20
delta-BHC	µg/L	0.20	<0.20
Heptachlor	µg/L	0.20	<0.20
Aldrin	µg/L	0.20	<0.20
Heptachlor epoxide	µg/L	0.20	<0.20
trans-Chlordane	µg/L	0.20	<0.20
cis-Chlordane	µg/L	0.20	<0.20
Endosulfan I	µg/L	0.20	<0.20
4,4'-DDE	µg/L	0.20	<0.20
Dieldrin	µg/L	0.20	<0.20
Endrin	µg/L	0.20	<0.20
4,4'-DDD	µg/L	0.20	<0.20
Endosulfan II	µg/L	0.20	<0.20
Endrin aldehyde	µg/L	0.20	<0.20
4,4'-DDT	µg/L	0.20	<0.20
Endosulfan sulfate	µg/L	0.20	<0.20
Endrin ketone	µg/L	0.20	<0.20
Methoxychlor	µg/L	0.20	<0.20
Mirex	µg/L	0.20	<0.20
Total +ve OCP	µg/L	0.20	<0.20
Surrogate 4-chloro-3-nitrobenzotrifluoride	%		*115*
Surrogate p-Terphenyl-D14	%		*73.5*

Organochlorine Pesticides - ANZG (Soil)

Envirolab ID	Units	PQL	PGD0893-01	PGD0893-02	PGD0893-03	PGD0893-04	PGD0893-05
Your Reference			EQ1	EQ2_1	EQ2_2	EQ3_3	EQ3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Chlordane	µg/kg		[NA]	[NA]	[NA]	[NA]	[NA]
alpha-BHC	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hexachlorobenzene	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
beta-BHC	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
gamma-BHC	µg/kg	0.30	<1.0	<1.0	<1.0	<1.0	<1.0
delta-BHC	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Heptachlor	µg/kg	1.0	<20 [13]	<20 [13]	<20 [13]	<20 [13]	<20 [13]
Aldrin	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Heptachlor epoxide	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trans-Chlordane	µg/kg	0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-Chlordane	µg/kg	0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Total +ve Chlordane	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Endosulfan I	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
4,4'-DDE	µg/kg	1.0	<20 [8] [13]	<20 [8] [13]	<20 [8] [13]	<20 [8] [13]	<20 [8] [13]
Dieldrin	µg/kg	0.20	<20 [13]	<20 [13]	<20 [13]	<20 [13]	<20 [13]
Endrin	µg/kg	0.20	<1.0	<1.0	<1.0	<1.0	<1.0
4,4'-DDD	µg/kg	1.0	<20 [8] [13]	<20 [8] [13]	<20 [8] [13]	<20 [8] [13]	<20 [8] [13]
Endosulfan II	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Endrin aldehyde	µg/kg	1.0	[NA]	[NA]	[NA]	[NA]	[NA]
4,4'-DDT	µg/kg	1.0	<20 [8] [13]	<20 [8] [13]	<20 [8] [13]	<20 [8] [13]	<20 [8] [13]
Endosulfan sulfate	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Endrin ketone	µg/kg	1.0	<20 [13]	<20 [13]	<20 [13]	<20 [13]	<20 [13]
Methoxychlor	µg/kg	1.0	<20 [13]	<20 [13]	<20 [13]	<20 [13]	<20 [13]
Mirex	µg/kg	2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Total +ve DDT+DDD+DDE	µg/kg	1.0	<20	<20	<20	<20	<20
Total +ve Aldrin + Dieldrin	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Total +ve OCP	µg/kg	0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Surrogate 4-chloro-3-nitrobenzotrifluoride	%		*## [7]*	*## [7]*	*## [7]*	*## [7]*	*## [7]*

Envirolab ID	Units	PQL	PGD0893-06	PGD0893-07	PGD0893-08	PGD0893-09	PGD0893-10
Your Reference			MB1_a	MB1_b	MB2	MB3	MB4
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Chlordane	µg/kg		[NA]	[NA]	[NA]	[NA]	[NA]
alpha-BHC	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hexachlorobenzene	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
beta-BHC	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
gamma-BHC	µg/kg	0.30	<1.0	<1.0	<1.0	<1.0	<1.0
delta-BHC	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Heptachlor	µg/kg	1.0	<20 [13]	<20 [13]	<20 [13]	<20 [13]	<20 [13]
Aldrin	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Heptachlor epoxide	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trans-Chlordane	µg/kg	0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-Chlordane	µg/kg	0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Total +ve Chlordane	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Endosulfan I	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
4,4'-DDE	µg/kg	1.0	<20 [8] [13]	<20 [8] [13]	<20 [8] [13]	<20 [8] [13]	<20 [8] [13]

Organochlorine Pesticides - ANZG (Soil)

Envirolab ID	Units	PQL	PGD0893-06	PGD0893-07	PGD0893-08	PGD0893-09	PGD0893-10
Your Reference			MB1_a	MB1_b	MB2	MB3	MB4
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Dieldrin	µg/kg	0.20	<20 [13]	<20 [13]	<20 [13]	<20 [13]	<20 [13]
Endrin	µg/kg	0.20	<1.0	<1.0	<1.0	<1.0	<1.0
4,4'-DDD	µg/kg	1.0	<20 [8] [13]	<20 [8] [13]	<20 [8] [13]	<20 [8] [13]	<20 [8] [13]
Endosulfan II	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Endrin aldehyde	µg/kg	1.0	[NA]	[NA]	[NA]	[NA]	[NA]
4,4'-DDT	µg/kg	1.0	<20 [8] [13]	<20 [8] [13]	<20 [8] [13]	<20 [8] [13]	<20 [8] [13]
Endosulfan sulfate	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Endrin ketone	µg/kg	1.0	<20 [13]	<20 [13]	<20 [13]	<20 [13]	<20 [13]
Methoxychlor	µg/kg	1.0	<20 [13]	<20 [13]	<20 [13]	<20 [13]	<20 [13]
Mirex	µg/kg	2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Total +ve DDT+DDD+DDE	µg/kg	1.0	<20	<20	<20	<20	<20
Total +ve Aldrin + Dieldrin	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Total +ve OCP	µg/kg	0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Surrogate 4-chloro-3-nitrobenzotrifluoride	%		*## [7]*	*## [7]*	*## [7]*	*## [7]*	*## [7]*

Envirolab ID	Units	PQL	PGD0893-11	PGD0893-12	PGD0893-13	PGD0893-14	PGD0893-15
Your Reference			MB5	MB6	AP1	AP2	AP3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Chlordane	µg/kg		[NA]	[NA]	[NA]	[NA]	[NA]
alpha-BHC	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hexachlorobenzene	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
beta-BHC	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
gamma-BHC	µg/kg	0.30	<1.0	<1.0	<1.0	<1.0	<1.0
delta-BHC	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Heptachlor	µg/kg	1.0	<20 [13]	<20 [13]	<20 [13]	<20 [13]	<20 [13]
Aldrin	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Heptachlor epoxide	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trans-Chlordane	µg/kg	0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-Chlordane	µg/kg	0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Total +ve Chlordane	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Endosulfan I	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
4,4'-DDE	µg/kg	1.0	<20 [8] [13]	<20 [8] [13]	<20 [8] [13]	<20 [8] [13]	<20 [8] [13]
Dieldrin	µg/kg	0.20	<20 [13]	<20 [13]	<20 [13]	<20 [13]	<20 [13]
Endrin	µg/kg	0.20	<1.0	<1.0	<1.0	<1.0	<1.0
4,4'-DDD	µg/kg	1.0	<20 [8] [13]	<20 [8] [13]	<20 [8] [13]	<20 [8] [13]	<20 [8] [13]
Endosulfan II	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Endrin aldehyde	µg/kg	1.0	[NA]	[NA]	[NA]	[NA]	[NA]
4,4'-DDT	µg/kg	1.0	<20 [8] [13]	<20 [8] [13]	<20 [8] [13]	<20 [8] [13]	<20 [8] [13]
Endosulfan sulfate	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Endrin ketone	µg/kg	1.0	<20 [13]	<20 [13]	<20 [13]	<20 [13]	<20 [13]
Methoxychlor	µg/kg	1.0	<20 [13]	<20 [13]	<20 [13]	<20 [13]	<20 [13]
Mirex	µg/kg	2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Total +ve DDT+DDD+DDE	µg/kg	1.0	<20	<20	<20	<20	<20
Total +ve Aldrin + Dieldrin	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Total +ve OCP	µg/kg	0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Surrogate 4-chloro-3-nitrobenzotrifluoride	%		*## [7]*	*## [7]*	*## [7]*	*## [7]*	*## [7]*

Organochlorine Pesticides - ANZG (Soil)

Envirolab ID	Units	PQL	PGD0893-16	PGD0893-17	PGD0893-18	PGD0893-19	PGD0893-20
Your Reference			CB1_1	CB1_2	CB1_3	CB2	CB3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Chlordane	µg/kg		[NA]	[NA]	[NA]	[NA]	[NA]
alpha-BHC	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hexachlorobenzene	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
beta-BHC	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
gamma-BHC	µg/kg	0.30	<1.0	<1.0	<1.0	<1.0	<0.30
delta-BHC	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Heptachlor	µg/kg	1.0	<20 [13]	<20 [13]	<20 [13]	<20 [13]	<1.0
Aldrin	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Heptachlor epoxide	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trans-Chlordane	µg/kg	0.50	2.9	<0.50	<0.50	<0.50	<0.50
cis-Chlordane	µg/kg	0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Total +ve Chlordane	µg/kg	1.0	2.9	<1.0	<1.0	<1.0	<1.0
Endosulfan I	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
4,4'-DDE	µg/kg	1.0	<20 [8] [13]	<20 [8] [13]	<20 [8] [13]	<20 [8] [13]	<1.0 [8]
Dieldrin	µg/kg	0.20	<20 [13]	<20 [13]	<20 [13]	<20 [13]	<1.0
Endrin	µg/kg	0.20	<1.0	<1.0	<1.0	<1.0	<1.0
4,4'-DDD	µg/kg	1.0	<20 [8] [13]	<20 [8] [13]	<20 [8] [13]	<20 [8] [13]	<1.0 [8]
Endosulfan II	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Endrin aldehyde	µg/kg	1.0	[NA]	[NA]	[NA]	[NA]	[NA]
4,4'-DDT	µg/kg	1.0	<20 [8] [13]	<20 [8] [13]	<20 [8] [13]	<20 [8] [13]	<1.0 [8]
Endosulfan sulfate	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Endrin ketone	µg/kg	1.0	<20 [13]	<20 [13]	<20 [13]	<20 [13]	<1.0
Methoxychlor	µg/kg	1.0	<20 [13]	<20 [13]	<20 [13]	<20 [13]	<1.0
Mirex	µg/kg	2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Total +ve DDT+DDD+DDE	µg/kg	1.0	<20	<20	<20	<20	<1.0
Total +ve Aldrin + Dieldrin	µg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Total +ve OCP	µg/kg	0.50	2.9	<0.50	<0.50	<0.50	<0.30
Surrogate 4-chloro-3-nitrobenzotrifluoride	%		*## [7]*	*## [7]*	*## [7]*	*## [7]*	*77.1*

Envirolab ID	Units	PQL	PGD0893-22
Your Reference			Trip blank
Date Sampled			10/04/2025
Chlordane	µg/kg		
alpha-BHC	µg/kg	1.0	<1.0
Hexachlorobenzene	µg/kg	1.0	<1.0
beta-BHC	µg/kg	1.0	<1.0
gamma-BHC	µg/kg	0.30	<0.30
delta-BHC	µg/kg	1.0	<1.0
Heptachlor	µg/kg	1.0	<1.0
Aldrin	µg/kg	1.0	<1.0
Heptachlor epoxide	µg/kg	1.0	<1.0
trans-Chlordane	µg/kg	0.50	<0.50
cis-Chlordane	µg/kg	0.50	<0.50
Total +ve Chlordane	µg/kg	1.0	<1.0
Endosulfan I	µg/kg	1.0	<1.0
4,4'-DDE	µg/kg	1.0	<1.0

Organochlorine Pesticides - ANZG (Soil)

Envirolab ID	Units	PQL	PGD0893-22
Your Reference			Trip blank
Date Sampled			10/04/2025
Dieldrin	µg/kg	0.20	<0.20
Endrin	µg/kg	0.20	<0.20
4,4'-DDD	µg/kg	1.0	<1.0
Endosulfan II	µg/kg	1.0	<1.0
Endrin aldehyde	µg/kg	1.0	<1.0
4,4'-DDT	µg/kg	1.0	<1.0
Endosulfan sulfate	µg/kg	1.0	<1.0
Endrin ketone	µg/kg	1.0	<1.0
Methoxychlor	µg/kg	1.0	<1.0
Mirex	µg/kg	2.0	<2.0
Total +ve DDT+DDD+DDE	µg/kg	1.0	<1.0
Total +ve Aldrin + Dieldrin	µg/kg	1.0	<1.0
Total +ve OCP	µg/kg	0.50	<0.20
Surrogate 4-chloro-3-nitrobenzotrifluoride	%		*110*

Polychlorinated Biphenyls (Water)

Envirolab ID	Units	PQL	PGD0893-21
Your Reference			Rinsate
Date Sampled			10/04/2025
Aroclor 1016	µg/L	2.0	<2.0
Aroclor 1221	µg/L	2.0	<2.0
Aroclor 1232	µg/L	2.0	<2.0
Aroclor 1242	µg/L	2.0	<2.0
Aroclor 1248	µg/L	2.0	<2.0
Aroclor 1254	µg/L	2.0	<2.0
Aroclor 1260	µg/L	2.0	<2.0
Total +ve PCB (1016-1260)	µg/L	2.0	<2.0
Surrogate 2-Fluorobiphenyl	%		*119*

Polychlorinated Biphenyls - NAGD (Soil)

Envirolab ID	Units	PQL	PGD0893-01	PGD0893-02	PGD0893-03	PGD0893-04	PGD0893-05
Your Reference			EQ1	EQ2_1	EQ2_2	EQ3_3	EQ3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Total PCBs	µg/kg	5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Surrogate 2-Fluorobiphenyl	%		*## [7]*	*## [7]*	*## [7]*	*## [7]*	*## [7]*

Envirolab ID	Units	PQL	PGD0893-06	PGD0893-07	PGD0893-08	PGD0893-09	PGD0893-10
Your Reference			MB1_a	MB1_b	MB2	MB3	MB4
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Total PCBs	µg/kg	5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Surrogate 2-Fluorobiphenyl	%		*## [7]*	*## [7]*	*## [7]*	*## [7]*	*## [7]*

Envirolab ID	Units	PQL	PGD0893-11	PGD0893-12	PGD0893-13	PGD0893-14	PGD0893-15
Your Reference			MB5	MB6	AP1	AP2	AP3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Total PCBs	µg/kg	5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Surrogate 2-Fluorobiphenyl	%		*## [7]*	*## [7]*	*## [7]*	*## [7]*	*## [7]*

Envirolab ID	Units	PQL	PGD0893-16	PGD0893-17	PGD0893-18	PGD0893-19	PGD0893-20
Your Reference			CB1_1	CB1_2	CB1_3	CB2	CB3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Total PCBs	µg/kg	5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Surrogate 2-Fluorobiphenyl	%		*## [7]*	*## [7]*	*## [7]*	*## [7]*	*79.0*

Envirolab ID	Units	PQL	PGD0893-22
Your Reference			Trip blank
Date Sampled			10/04/2025
Total PCBs	µg/kg	5.0	<5.0
Surrogate 2-Fluorobiphenyl	%		*121*

Synthetic Pyrethroids (Soil)

Envirolab ID	Units	PQL	PGD0893-01	PGD0893-02	PGD0893-03	PGD0893-04	PGD0893-05
Your Reference			EQ1	EQ2_1	EQ2_2	EQ3_3	EQ3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Bifenthrin	µg/kg	10	19	<10	<10	<10	13
lamda-Cyhalothrin	µg/kg	10	<10	<10	<10	<10	<10
cis-Permethrin	µg/kg	10	<10	<10	<10	<10	<10
trans-Permethrin	µg/kg	10	<10	<10	<10	<10	<10
Cyfluthrin	µg/kg	100	<100	<100	<100	<100	<100
Cypermethrin	µg/kg	100	<100	<100	<100	<100	<100
Esfenvalerate	µg/kg	10	<10	<10	<10	<10	<10
Deltamethrin	µg/kg	10	<200 [13]	<200 [13]	<200 [13]	<200 [13]	<200 [13]
Surrogate p-Terphenyl-D14	%		*63.9*	*89.6*	*## [7]*	*## [7]*	*## [7]*

Envirolab ID	Units	PQL	PGD0893-06	PGD0893-07	PGD0893-08	PGD0893-09	PGD0893-10
Your Reference			MB1_a	MB1_b	MB2	MB3	MB4
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Bifenthrin	µg/kg	10	<10	<10	<10	<10	<10
lamda-Cyhalothrin	µg/kg	10	<10	<10	<10	<10	<10
cis-Permethrin	µg/kg	10	<10	<10	<10	<10	<10
trans-Permethrin	µg/kg	10	<10	<10	<10	<10	<10
Cyfluthrin	µg/kg	100	<100	<100	<100	<100	<100
Cypermethrin	µg/kg	100	<100	<100	<100	<100	<100
Esfenvalerate	µg/kg	10	<10	<10	<10	<10	<10
Deltamethrin	µg/kg	10	<200 [13]	<200 [13]	<200 [13]	<200 [13]	<200 [13]
Surrogate p-Terphenyl-D14	%		*69.2*	*75.4*	*66.5*	*98.7*	*66.4*

Envirolab ID	Units	PQL	PGD0893-11	PGD0893-12	PGD0893-13	PGD0893-14	PGD0893-15
Your Reference			MB5	MB6	AP1	AP2	AP3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Bifenthrin	µg/kg	10	<10	<10	<10	<10	<10
lamda-Cyhalothrin	µg/kg	10	<10	<10	<10	<10	<10
cis-Permethrin	µg/kg	10	<10	<10	<10	<10	<10
trans-Permethrin	µg/kg	10	<10	<10	<10	<10	<10
Cyfluthrin	µg/kg	100	<100	<100	<100	<100	<100
Cypermethrin	µg/kg	100	<100	<100	<100	<100	<100
Esfenvalerate	µg/kg	10	<10	<10	<10	<10	<10
Deltamethrin	µg/kg	10	<200 [13]	<200 [13]	<200 [13]	<200 [13]	<200 [13]
Surrogate p-Terphenyl-D14	%		*74.1*	*## [7]*	*## [7]*	*## [7]*	*## [7]*

Envirolab ID	Units	PQL	PGD0893-16	PGD0893-17	PGD0893-18	PGD0893-19	PGD0893-20
Your Reference			CB1_1	CB1_2	CB1_3	CB2	CB3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Bifenthrin	µg/kg	10	<10	<10	<10	<10	<10
lamda-Cyhalothrin	µg/kg	10	<10	<10	<10	<10	<10
cis-Permethrin	µg/kg	10	<10	<10	<10	<10	<10
trans-Permethrin	µg/kg	10	<10	<10	<10	<10	<10
Cyfluthrin	µg/kg	100	<100	<100	<100	<100	<100
Cypermethrin	µg/kg	100	<100	<100	<100	<100	<100
Esfenvalerate	µg/kg	10	<10	<10	<10	<10	<10
Deltamethrin	µg/kg	10	<200 [13]	<200 [13]	<200 [13]	<200 [13]	<10
Surrogate p-Terphenyl-D14	%		*## [7]*	*60.3*	*## [7]*	*62.1*	*97.3*

Synthetic Pyrethroids (Soil)

Envirolab ID	Units	PQL	PGD0893-22
Your Reference			Trip blank
Date Sampled			10/04/2025
Bifenthrin	µg/kg	10	<10
lamda-Cyhalothrin	µg/kg	10	<10
cis-Permethrin	µg/kg	10	<10
trans-Permethrin	µg/kg	10	<10
Cyfluthrin	µg/kg	100	<100
Cypermethrin	µg/kg	100	<100
Esfenvalerate	µg/kg	10	<10
Deltamethrin	µg/kg	10	<10
Surrogate p-Terphenyl-D14	%		*131*

Diuron/Fluometuron (Soil)

Envirolab ID	Units	PQL	PGD0893-01	PGD0893-02	PGD0893-03	PGD0893-04	PGD0893-05
Your Reference			EQ1	EQ2_1	EQ2_2	EQ3_3	EQ3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Fluometuron	µg/kg	10	<10	<10	<10	<10	<10
Diuron	µg/kg	10	<10	<10	<10	<10	<10
Surrogate Terbuthylazine-d5	%		*62.0*	*61.1*	*71.5*	*67.0*	*60.1*

Envirolab ID	Units	PQL	PGD0893-06	PGD0893-07	PGD0893-08	PGD0893-09	PGD0893-10
Your Reference			MB1_a	MB1_b	MB2	MB3	MB4
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Fluometuron	µg/kg	10	<10	<10	<10	<10	<10
Diuron	µg/kg	10	<10	<10	<10	<10	<10
Surrogate Terbuthylazine-d5	%		*99.2*	*82.5*	*70.4*	*88.9*	*93.1*

Envirolab ID	Units	PQL	PGD0893-11	PGD0893-12	PGD0893-13	PGD0893-14	PGD0893-15
Your Reference			MB5	MB6	AP1	AP2	AP3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Fluometuron	µg/kg	10	<10	<10	<10	<10	<10
Diuron	µg/kg	10	<10	<10	<10	<10	<10
Surrogate Terbuthylazine-d5	%		*60.8*	*61.9*	*96.1*	*90.1*	*75.8*

Envirolab ID	Units	PQL	PGD0893-16	PGD0893-17	PGD0893-18	PGD0893-19	PGD0893-20
Your Reference			CB1_1	CB1_2	CB1_3	CB2	CB3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Fluometuron	µg/kg	10	<10	<10	<10	<10	<10
Diuron	µg/kg	10	<10	<10	<10	<10	<10
Surrogate Terbuthylazine-d5	%		*66.9*	*78.2*	*56.8*	*70.3*	*89.1*

Envirolab ID	Units	PQL	PGD0893-22
Your Reference			Trip blank
Date Sampled			10/04/2025
Fluometuron	µg/kg	10	<10
Diuron	µg/kg	10	<10
Surrogate Terbuthylazine-d5	%		*83.8*

Diuron/Fluometuron (Water)

Envirolab ID	Units	PQL	PGD0893-21
Your Reference			Rinsate
Date Sampled			10/04/2025
Fluometuron	µg/L	0.020	<0.020
Diuron	µg/L	0.020	<0.020
Surrogate Terbuthylazine-d5	%		*101*

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Organometallics (Soil)

Envirolab ID	Units	PQL	PGD0893-01	PGD0893-02	PGD0893-03	PGD0893-04	PGD0893-05
Your Reference			EQ1	EQ2_1	EQ2_2	EQ3_3	EQ3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Monobutyltin as Sn	µg/kg	20	<100 [12]	<100 [12]	<100 [12]	<100 [12]	<100 [12]
Dibutyltin as Sn	µg/kg	0.50	<5.0	<5.0 [12]	<5.0 [12]	<5.0 [12]	<5.0 [12]
Tributyltin as Sn	µg/kg	0.50	<5.0 [12]	<5.0 [12]	<5.0 [12]	<5.0 [12]	<5.0 [12]
Surrogate Triphenyltin	%		*91.0*	*93.6*	*95.2*	*92.8*	*88.9*

Envirolab ID	Units	PQL	PGD0893-06	PGD0893-07	PGD0893-08	PGD0893-09	PGD0893-10
Your Reference			MB1_a	MB1_b	MB2	MB3	MB4
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Monobutyltin as Sn	µg/kg	20	<100 [12]	<100 [12]	<100 [12]	<100 [12]	<100 [12]
Dibutyltin as Sn	µg/kg	0.50	<5.0 [12]	<5.0 [12]	<5.0 [12]	<5.0 [12]	<5.0 [12]
Tributyltin as Sn	µg/kg	0.50	<5.0 [12]	<5.0 [12]	<5.0 [12]	<5.0 [12]	<5.0 [12]
Surrogate Triphenyltin	%		*93.4*	*95.5*	*90.4*	*98.2*	*99.1*

Envirolab ID	Units	PQL	PGD0893-11	PGD0893-12	PGD0893-13	PGD0893-14	PGD0893-15
Your Reference			MB5	MB6	AP1	AP2	AP3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Monobutyltin as Sn	µg/kg	20	<100 [12]	<100 [12]	<100 [12]	<100 [12]	<100 [12]
Dibutyltin as Sn	µg/kg	0.50	9.5	<5.0 [12]	<5.0 [12]	<5.0 [12]	<5.0 [12]
Tributyltin as Sn	µg/kg	0.50	<5.0 [12]	<5.0 [12]	<5.0 [12]	<5.0 [12]	<5.0 [12]
Surrogate Triphenyltin	%		*94.9*	*101*	*99.6*	*92.0*	*93.8*

Envirolab ID	Units	PQL	PGD0893-16	PGD0893-17	PGD0893-18	PGD0893-19	PGD0893-20
Your Reference			CB1_1	CB1_2	CB1_3	CB2	CB3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Monobutyltin as Sn	µg/kg	20	<100 [12]	<100 [12]	<100 [12]	<100 [12]	<100 [12]
Dibutyltin as Sn	µg/kg	0.50	17	14	14	21	<5.0 [12]
Tributyltin as Sn	µg/kg	0.50	<5.0 [12]	<5.0 [12]	<5.0 [12]	<5.0 [12]	<5.0 [12]
Surrogate Triphenyltin	%		*95.3*	*93.3*	*96.8*	*104*	*99.5*

Envirolab ID	Units	PQL	PGD0893-22
Your Reference			Trip blank
Date Sampled			10/04/2025
Monobutyltin as Sn	µg/kg	20	<20
Dibutyltin as Sn	µg/kg	0.50	<0.50
Tributyltin as Sn	µg/kg	0.50	<0.50
Surrogate Triphenyltin	%		*103*

Organometallics (Water)

Envirolab ID	Units	PQL	PGD0893-21	PGD0893-23
Your Reference			Rinsate	Elutriate blank
Date Sampled			10/04/2025	10/04/2025
Monobutyltin as Sn	µg/L	0.020	<0.020	<0.020
Dibutyltin as Sn	µg/L	0.0020	<0.0020	<0.0020
Tributyltin as Sn	µg/L	0.0020	<0.0020	<0.0020
Tributyltin as Sn	µg/L	0.0020	[NA]	<0.0020
Surrogate Triphenyltin	%		*99.7*	*103*
Surrogate Triphenyltin	%		*[NA]*	*99.8*

ADWG - GCMS SVOCs (Soil)

Envirolab ID	Units	PQL	PGD0893-01	PGD0893-02	PGD0893-03	PGD0893-04	PGD0893-05
Your Reference			EQ1	EQ2_1	EQ2_2	EQ3_3	EQ3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Chlorothalonil*	µg/kg	500	<500	<500	<500	<500	<500
*Surrogate p-Terphenyl-D14**	%		*107*	*94.1*	*106*	*92.3*	*104*

Envirolab ID	Units	PQL	PGD0893-06	PGD0893-07	PGD0893-08	PGD0893-09	PGD0893-10
Your Reference			MB1_a	MB1_b	MB2	MB3	MB4
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Chlorothalonil*	µg/kg	500	<500	<500	<500	<500	<500
*Surrogate p-Terphenyl-D14**	%		*104*	*103*	*108*	*92.6*	*93.9*

Envirolab ID	Units	PQL	PGD0893-11	PGD0893-12	PGD0893-13	PGD0893-14	PGD0893-15
Your Reference			MB5	MB6	AP1	AP2	AP3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Chlorothalonil*	µg/kg	500	<500	<500	<500	<500	<500
*Surrogate p-Terphenyl-D14**	%		*93.3*	*110*	*105*	*102*	*90.3*

Envirolab ID	Units	PQL	PGD0893-16	PGD0893-17	PGD0893-18	PGD0893-19	PGD0893-20
Your Reference			CB1_1	CB1_2	CB1_3	CB2	CB3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Chlorothalonil*	µg/kg	500	<500	<500	<500	<500	<500
*Surrogate p-Terphenyl-D14**	%		*107*	*82.8*	*84.9*	*86.2*	*76.7*

Envirolab ID	Units	PQL	PGD0893-22
Your Reference			Trip blank
Date Sampled			10/04/2025
Chlorothalonil*	µg/kg	500	<500
*Surrogate p-Terphenyl-D14**	%		*96.3*

ADWG - GCMS SVOCs (Water)

Envirolab ID	Units	PQL	PGD0893-21
Your Reference			Rinsate
Date Sampled			10/04/2025
Fluazifop-p-butyl	µg/L	0.50	<0.50
Dichlobenil	µg/L	0.50	<0.50
Etridiazole	µg/L	0.50	<0.50
Vernolate	µg/L	0.50	<0.50
Pebulate	µg/L	0.50	<0.50
Propachlor	µg/L	0.50	<0.50
Chlorothalonil	µg/L	0.50	<0.50
Pirimicarb	µg/L	0.50	<0.50
Pronamide	µg/L	0.50	<0.50
Terbacil	µg/L	0.50	<0.50
Metalaxyl	µg/L	0.50	<0.50
Triadimefon	µg/L	0.50	<0.50
Fipronil	µg/L	0.50	<0.50
Napropamide	µg/L	0.50	<0.50
Flamprop-methyl	µg/L	0.50	<0.50
Procymidome	µg/L	0.50	<0.50
Hexaconazole	µg/L	0.50	<0.50
Diclofop Methyl	µg/L	0.50	<0.50
Propargite	µg/L	0.50	<0.50
Bioresmethrin	µg/L	0.50	<0.50
Piperonyl butoxide	µg/L	0.50	<0.50
Fenarimol	µg/L	0.50	<0.50
Hexachlorophene	µg/L	0.50	<0.50
Fluridone	µg/L	0.50	<0.50
Esfenvalerate	µg/L	0.50	<0.50
Azoxystrobin	µg/L	0.50	<0.50
Surrogate p-Terphenyl-D14	%		*117*

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Acid Extractable Metals (Soil)

Envirolab ID	Units	PQL	PGD0893-01	PGD0893-02	PGD0893-03	PGD0893-04	PGD0893-05
Your Reference			EQ1	EQ2_1	EQ2_2	EQ3_3	EQ3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Chromium	mg/kg	1.0	51	19	22	22	25

Envirolab ID	Units	PQL	PGD0893-06	PGD0893-07	PGD0893-08	PGD0893-09	PGD0893-10
Your Reference			MB1_a	MB1_b	MB2	MB3	MB4
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Chromium	mg/kg	1.0	2.5	4.4	65	74	2.8

Envirolab ID	Units	PQL	PGD0893-11	PGD0893-12	PGD0893-13	PGD0893-14	PGD0893-15
Your Reference			MB5	MB6	AP1	AP2	AP3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Chromium	mg/kg	1.0	75	4.2	2.0	35	3.2

Envirolab ID	Units	PQL	PGD0893-16	PGD0893-17	PGD0893-18	PGD0893-19	PGD0893-20
Your Reference			CB1_1	CB1_2	CB1_3	CB2	CB3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Chromium	mg/kg	1.0	43	44	42	54	16

Envirolab ID	Units	PQL	PGD0893-22
Your Reference			Trip blank
Date Sampled			10/04/2025
Chromium	mg/kg	1.0	1.0

Acid Extractable Metals (Water)

Envirolab ID	Units	PQL	PGD0893-21	PGD0893-23
Your Reference			Rinsate	Elutriate blank
Date Sampled			10/04/2025	10/04/2025
Phosphorus	mg/L	0.050	<0.050	<0.25 [11]

Acid Extractable Low Level Metals (Soil)

Envirolab ID	Units	PQL	PGD0893-01	PGD0893-02	PGD0893-03	PGD0893-04	PGD0893-05
Your Reference			EQ1	EQ2_1	EQ2_2	EQ3_3	EQ3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Silver	mg/kg	0.10	0.33	<0.10	<0.10	0.15	0.15
Aluminium	mg/kg	1.0	21000	5400	5300	8000	11000
Arsenic	mg/kg	0.50	15	3.9	3.7	4.4	5.4
Boron	mg/kg	2.0	29	16	14	16	20
Barium	mg/kg	0.50	28	14	15	11	42
Beryllium	mg/kg	0.50	0.86	<0.50	<0.50	<0.50	<0.50
Cadmium	mg/kg	0.10	0.19	<0.10	<0.10	<0.10	<0.10
Cobalt	mg/kg	0.50	9.9	3.1	2.8	3.9	4.7
Copper	mg/kg	0.50	55	18	19	18	29
Iron	mg/kg	1.0	35000	12000	9800	14000	17000
Mercury	mg/kg	0.010	0.27	0.074	0.072	0.18	0.13
Manganese	mg/kg	0.50	140	60	52	67	110
Molybdenum	mg/kg	0.50	2.2	0.68	1.0	0.64	0.90
Nickel	mg/kg	0.50	14	4.8	6.9	5.0	7.0
Lead	mg/kg	0.50	61	20	32	310	29
Antimony	mg/kg	0.50	0.58	<0.50	<0.50	<0.50	<0.50
Selenium	mg/kg	0.20	0.47	<0.20	<0.20	<0.20	0.20
Vanadium	mg/kg	0.50	63	22	19	25	31
Zinc	mg/kg	0.50	190	60	50	56	97

Envirolab ID	Units	PQL	PGD0893-06	PGD0893-07	PGD0893-08	PGD0893-09	PGD0893-10
Your Reference			MB1_a	MB1_b	MB2	MB3	MB4
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Silver	mg/kg	0.10	<0.10	<0.10	0.38	0.43	<0.10
Aluminium	mg/kg	1.0	860	1700	31000	36000	920
Arsenic	mg/kg	0.50	1.1	1.4	15	12	0.75
Boron	mg/kg	2.0	5.1	8.4	310	69	11
Barium	mg/kg	0.50	0.97	1.7	22	26	1.2
Beryllium	mg/kg	0.50	<0.50	<0.50	1.0	1.2	<0.50
Cadmium	mg/kg	0.10	<0.10	<0.10	0.65	0.19	<0.10
Cobalt	mg/kg	0.50	0.63	1.1	14	15	0.72
Copper	mg/kg	0.50	3.0	5.8	120	110	5.2
Iron	mg/kg	1.0	1500	2700	39000	41000	1300
Mercury	mg/kg	0.010	<0.010	0.013	0.21	0.25	<0.010
Manganese	mg/kg	0.50	28	28	190	230	13
Molybdenum	mg/kg	0.50	<0.50	<0.50	13	1.4	0.57
Nickel	mg/kg	0.50	0.73	1.4	23	24	0.87
Lead	mg/kg	0.50	4.5	6.8	97	120	4.6
Antimony	mg/kg	0.50	<0.50	<0.50	0.77	<0.50	<0.50
Selenium	mg/kg	0.20	<0.20	<0.20	1.3	0.70	<0.20
Vanadium	mg/kg	0.50	3.5	5.5	93	86	4.2
Zinc	mg/kg	0.50	12	23	410	400	23

Envirolab ID	Units	PQL	PGD0893-11	PGD0893-12	PGD0893-13	PGD0893-14	PGD0893-15
Your Reference			MB5	MB6	AP1	AP2	AP3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Silver	mg/kg	0.10	0.43	<0.10	<0.10	0.11	<0.10

Acid Extractable Low Level Metals (Soil)

Envirolab ID	Units	PQL	PGD0893-11	PGD0893-12	PGD0893-13	PGD0893-14	PGD0893-15
Your Reference			MB5	MB6	AP1	AP2	AP3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Aluminium	mg/kg	1.0	38000	1500	730	22000	1500
Arsenic	mg/kg	0.50	13	0.83	0.76	9.2	0.79
Boron	mg/kg	2.0	69	10	6.2	48	7.9
Barium	mg/kg	0.50	27	1.3	0.76	11	1.4
Beryllium	mg/kg	0.50	1.3	<0.50	<0.50	0.67	<0.50
Cadmium	mg/kg	0.10	0.16	<0.10	<0.10	0.24	<0.10
Cobalt	mg/kg	0.50	15	1.0	0.54	7.1	0.58
Copper	mg/kg	0.50	110	11	3.4	38	4.7
Iron	mg/kg	1.0	43000	2200	1000	23000	1500
Mercury	mg/kg	0.010	0.26	0.014	<0.010	0.13	<0.010
Manganese	mg/kg	0.50	280	18	61	190	10
Molybdenum	mg/kg	0.50	1.4	<0.50	<0.50	6.9	0.81
Nickel	mg/kg	0.50	25	1.8	0.65	12	1.1
Lead	mg/kg	0.50	110	6.9	3.6	36	4.3
Antimony	mg/kg	0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Selenium	mg/kg	0.20	0.68	<0.20	<0.20	0.78	<0.20
Vanadium	mg/kg	0.50	84	5.4	3.0	43	4.6
Zinc	mg/kg	0.50	390	23	9.3	140	14

Envirolab ID	Units	PQL	PGD0893-16	PGD0893-17	PGD0893-18	PGD0893-19	PGD0893-20
Your Reference			CB1_1	CB1_2	CB1_3	CB2	CB3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Silver	mg/kg	0.10	0.16	0.17	0.16	0.22	<0.10
Aluminium	mg/kg	1.0	24000	25000	24000	30000	9100
Arsenic	mg/kg	0.50	8.3	9.8	9.2	12	4.3
Boron	mg/kg	2.0	52	54	56	63	21
Barium	mg/kg	0.50	13	14	14	18	6.2
Beryllium	mg/kg	0.50	0.74	0.81	0.77	0.95	<0.50
Cadmium	mg/kg	0.10	0.10	0.10	0.11	0.12	0.21
Cobalt	mg/kg	0.50	8.0	8.8	8.2	11	3.5
Copper	mg/kg	0.50	58	69	61	86	25
Iron	mg/kg	1.0	26000	26000	25000	33000	10000
Mercury	mg/kg	0.010	0.11	0.14	0.13	0.19	0.093
Manganese	mg/kg	0.50	180	190	190	230	71
Molybdenum	mg/kg	0.50	2.6	2.1	2.7	2.0	1.9
Nickel	mg/kg	0.50	14	15	14	18	5.5
Lead	mg/kg	0.50	59	68	65	87	26
Antimony	mg/kg	0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Selenium	mg/kg	0.20	0.63	0.65	0.68	0.78	0.32
Vanadium	mg/kg	0.50	49	53	49	63	22
Zinc	mg/kg	0.50	200	230	200	290	95

Envirolab ID	Units	PQL	PGD0893-22
Your Reference			Trip blank
Date Sampled			10/04/2025
Silver	mg/kg	0.10	<0.10
Aluminium	mg/kg	1.0	270

Acid Extractable Low Level Metals (Soil)

Envirolab ID	Units	PQL	PGD0893-22
Your Reference			Trip blank
Date Sampled			10/04/2025
Arsenic	mg/kg	0.50	<0.50
Boron	mg/kg	2.0	<2.0
Barium	mg/kg	0.50	0.87
Beryllium	mg/kg	0.50	<0.50
Cadmium	mg/kg	0.10	<0.10
Cobalt	mg/kg	0.50	<0.50
Copper	mg/kg	0.50	<0.50
Iron	mg/kg	1.0	66
Mercury	mg/kg	0.010	<0.010
Manganese	mg/kg	0.50	0.89
Molybdenum	mg/kg	0.50	<0.50
Nickel	mg/kg	0.50	<0.50
Lead	mg/kg	0.50	0.84
Antimony	mg/kg	0.50	<0.50
Selenium	mg/kg	0.20	<0.20
Vanadium	mg/kg	0.50	<0.50
Zinc	mg/kg	0.50	<0.50

Acid Extractable Low Level Metals (Water)

Envirolab ID	Units	PQL	PGD0893-21	PGD0893-23
Your Reference			Rinsate	Elutriate blank
Date Sampled			10/04/2025	10/04/2025
Silver	µg/L	1.0	<1.0	<2.0 [13]
Aluminium	µg/L	10	<10	40
Arsenic	µg/L	1.0	<1.0	2.8
Boron	µg/L	20	<20	5100
Barium	µg/L	1.0	<1.0	23
Beryllium	µg/L	0.50	<0.50	<1.0 [13]
Cadmium	µg/L	0.10	<0.10	<0.20 [13]
Cobalt	µg/L	1.0	<1.0	<2.0 [13]
Chromium	µg/L	1.0	<1.0	<2.0 [13]
Copper	µg/L	1.0	<1.0	8.2
Iron	µg/L	10	<10	78
Mercury	µg/L	0.050	<0.050	<0.050
Manganese	µg/L	1.0	<1.0	31
Molybdenum	µg/L	1.0	<1.0	15
Nickel	µg/L	1.0	<1.0	<2.0 [13]
Lead	µg/L	1.0	<1.0	<2.0 [13]
Selenium	µg/L	1.0	<1.0	<2.0 [13]
Vanadium	µg/L	1.0	<1.0	5.1
Zinc	µg/L	1.0	2.0	12

Dissolved Low Level Metals (Water)

Envirolab ID	Units	PQL	PGD0893-21	PGD0893-23
Your Reference			Rinsate	Elutriate blank
Date Sampled			10/04/2025	10/04/2025
Chromium	µg/L	1.0	<1.0	<2.0 [13]

NAGD Elutriate Metals - SW (Soil)

Envirolab ID	Units	PQL	PGD0893-01	PGD0893-02	PGD0893-03	PGD0893-04	PGD0893-05
Your Reference			EQ1	EQ2_1	EQ2_2	EQ3_3	EQ3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Silver	mg/L	0.0010	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]
Aluminium	mg/L	0.010	<0.020 [11]	<0.020 [11]	<0.020 [11]	<0.020 [11]	<0.020 [11]
Arsenic	mg/L	0.0010	0.0047 [11]	0.0028 [11]	0.0025 [11]	0.0024 [11]	0.0028 [11]
Boron	mg/L	0.020	5.3 [11]	5.4 [11]	5.6 [11]	5.7 [11]	5.7 [11]
Barium	mg/L	0.0010	0.034 [11]	0.032 [11]	0.029 [11]	0.026 [11]	0.028 [11]
Beryllium	mg/L	0.00050	<0.0010 [11]	<0.0010 [11]	<0.0010 [11]	<0.0010 [11]	<0.0010 [11]
Cadmium	mg/L	0.00010	<0.00020 [11]	<0.00020 [11]	<0.00020 [11]	<0.00020 [11]	<0.00020 [11]
Cobalt	mg/L	0.0010	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]
Chromium	mg/L	0.0010	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]
Copper	mg/L	0.0010	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]
Iron	mg/L	0.010	1.4 [11]	<0.020 [11]	<0.020 [11]	<0.020 [11]	<0.020 [11]
Mercury	mg/L	0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Manganese	mg/L	0.0010	0.86 [11]	0.34 [11]	0.58 [11]	0.71 [11]	1.3 [11]
Molybdenum	mg/L	0.0010	0.030 [11]	0.021 [11]	0.016 [11]	0.016 [11]	0.018 [11]
Nickel	mg/L	0.0010	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]
Lead	mg/L	0.0010	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]
Antimony	mg/L	0.0010	0.0028 [11]	0.0025 [11]	<0.0020 [11]	0.0023 [11]	<0.0020 [11]
Selenium	mg/L	0.0010	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]
Vanadium	mg/L	0.0010	<0.0020 [11]	0.0055 [11]	0.0053 [11]	0.0069 [11]	0.0039 [11]
Zinc	mg/L	0.0010	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]

Envirolab ID	Units	PQL	PGD0893-06	PGD0893-07	PGD0893-08	PGD0893-09	PGD0893-10
Your Reference			MB1_a	MB1_b	MB2	MB3	MB4
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Silver	mg/L	0.0010	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]
Aluminium	mg/L	0.010	<0.020 [11]	<0.020 [11]	<0.020 [11]	<0.020 [11]	<0.020 [11]
Arsenic	mg/L	0.0010	<0.0020 [11]	0.0025 [11]	0.0038 [11]	0.0056 [11]	0.0024 [11]
Boron	mg/L	0.020	5.9 [11]	6.0 [11]	4.3 [11]	5.4 [11]	5.6 [11]
Barium	mg/L	0.0010	0.021 [11]	0.021 [11]	0.021 [11]	0.023 [11]	0.021 [11]
Beryllium	mg/L	0.00050	<0.0010 [11]	<0.0010 [11]	<0.0010 [11]	<0.0010 [11]	<0.0010 [11]
Cadmium	mg/L	0.00010	<0.00020 [11]	<0.00020 [11]	<0.00020 [11]	<0.00020 [11]	<0.00020 [11]
Cobalt	mg/L	0.0010	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]
Chromium	mg/L	0.0010	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]
Copper	mg/L	0.0010	0.0025 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]
Iron	mg/L	0.010	<0.020 [11]	<0.020 [11]	<0.020 [11]	<0.020 [11]	<0.020 [11]
Mercury	mg/L	0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Manganese	mg/L	0.0010	<0.0020 [11]	0.11 [11]	0.11 [11]	0.59 [11]	0.34 [11]
Molybdenum	mg/L	0.0010	0.014 [11]	0.015 [11]	0.12 [11]	0.023 [11]	0.075 [11]
Nickel	mg/L	0.0010	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]
Lead	mg/L	0.0010	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]
Antimony	mg/L	0.0010	<0.0020 [11]	<0.0020 [11]	0.0025 [11]	0.0037 [11]	0.0024 [11]
Selenium	mg/L	0.0010	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]
Vanadium	mg/L	0.0010	0.0033 [11]	0.0087 [11]	0.013 [11]	0.012 [11]	0.0033 [11]
Zinc	mg/L	0.0010	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]

NAGD Elutriate Metals - SW (Soil)

Envirolab ID	Units	PQL	PGD0893-11	PGD0893-12	PGD0893-13	PGD0893-14	PGD0893-15
Your Reference			MB5	MB6	AP1	AP2	AP3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Silver	mg/L	0.0010	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]
Aluminium	mg/L	0.010	<0.020 [11]	<0.020 [11]	<0.020 [11]	<0.020 [11]	<0.020 [11]
Arsenic	mg/L	0.0010	0.0046 [11]	<0.0020 [11]	0.0034 [11]	0.0097 [11]	<0.0020 [11]
Boron	mg/L	0.020	5.4 [11]	5.8 [11]	6.0 [11]	5.6 [11]	5.9 [11]
Barium	mg/L	0.0010	0.023 [11]	0.021 [11]	0.024 [11]	0.022 [11]	0.021 [11]
Beryllium	mg/L	0.00050	<0.0010 [11]	<0.0010 [11]	<0.0010 [11]	<0.0010 [11]	<0.0010 [11]
Cadmium	mg/L	0.00010	<0.00020 [11]	<0.00020 [11]	<0.00020 [11]	<0.00020 [11]	<0.00020 [11]
Cobalt	mg/L	0.0010	<0.0020 [11]	<0.0020 [11]	0.0038 [11]	<0.0020 [11]	<0.0020 [11]
Chromium	mg/L	0.0010	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]
Copper	mg/L	0.0010	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]
Iron	mg/L	0.010	<0.020 [11]	<0.020 [11]	<0.020 [11]	<0.020 [11]	<0.020 [11]
Mercury	mg/L	0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Manganese	mg/L	0.0010	1.1 [11]	0.41 [11]	0.11 [11]	0.31 [11]	0.18 [11]
Molybdenum	mg/L	0.0010	0.023 [11]	0.055 [11]	0.018 [11]	0.064 [11]	0.060 [11]
Nickel	mg/L	0.0010	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]
Lead	mg/L	0.0010	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]
Antimony	mg/L	0.0010	0.0029 [11]	<0.0020 [11]	0.0044 [11]	0.0045 [11]	0.0023 [11]
Selenium	mg/L	0.0010	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]
Vanadium	mg/L	0.0010	0.0090 [11]	0.0038 [11]	0.0040 [11]	0.043 [11]	0.0033 [11]
Zinc	mg/L	0.0010	<0.0020 [11]	0.0055 [11]	0.0029 [11]	0.0037 [11]	0.0043 [11]

Envirolab ID	Units	PQL	PGD0893-16	PGD0893-17	PGD0893-18	PGD0893-19	PGD0893-20
Your Reference			CB1_1	CB1_2	CB1_3	CB2	CB3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Silver	mg/L	0.0010	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]
Aluminium	mg/L	0.010	<0.020 [11]	<0.020 [11]	<0.020 [11]	<0.020 [11]	<0.020 [11]
Arsenic	mg/L	0.0010	0.0088 [11]	0.0090 [11]	0.0084 [11]	0.0062 [11]	0.011 [11]
Boron	mg/L	0.020	5.8 [11]	5.6 [11]	5.7 [11]	5.6 [11]	6.0 [11]
Barium	mg/L	0.0010	0.022 [11]	0.022 [11]	0.021 [11]	0.023 [11]	0.020 [11]
Beryllium	mg/L	0.00050	<0.0010 [11]	<0.0010 [11]	<0.0010 [11]	<0.0010 [11]	<0.0010 [11]
Cadmium	mg/L	0.00010	<0.00020 [11]	<0.00020 [11]	<0.00020 [11]	<0.00020 [11]	<0.00020 [11]
Cobalt	mg/L	0.0010	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]
Chromium	mg/L	0.0010	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]
Copper	mg/L	0.0010	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]
Iron	mg/L	0.010	<0.020 [11]	<0.020 [11]	<0.020 [11]	<0.020 [11]	<0.020 [11]
Mercury	mg/L	0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Manganese	mg/L	0.0010	0.32 [11]	0.40 [11]	0.77 [11]	1.1 [11]	0.13 [11]
Molybdenum	mg/L	0.0010	0.035 [11]	0.028 [11]	0.022 [11]	0.021 [11]	0.027 [11]
Nickel	mg/L	0.0010	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]
Lead	mg/L	0.0010	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]
Antimony	mg/L	0.0010	0.0039 [11]	0.0041 [11]	0.0040 [11]	0.0032 [11]	0.0044 [11]
Selenium	mg/L	0.0010	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]	<0.0020 [11]
Vanadium	mg/L	0.0010	0.020 [11]	0.021 [11]	0.017 [11]	0.0091 [11]	0.032 [11]
Zinc	mg/L	0.0010	0.0096 [11]	0.0040 [11]	<0.0020 [11]	0.0037 [11]	0.0050 [11]

Dilute Acid Extractable Bioavailable Metals (1M HCl) (Soil)

Envirolab ID	Units	PQL	PGD0893-01	PGD0893-02	PGD0893-03	PGD0893-04	PGD0893-05
Your Reference			EQ1	EQ2_1	EQ2_2	EQ3_3	EQ3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Copper*	mg/kg	1.0	33	7.8	11	8.8	19
Mercury*	mg/kg	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nickel*	mg/kg	1.0	5.6	<1.0	<1.0	<1.0	1.2
Lead*	mg/kg	1.0	36	8.2	13	49	21
Zinc*	mg/kg	1.0	110	26	40	26	65

Envirolab ID	Units	PQL	PGD0893-06	PGD0893-08	PGD0893-09	PGD0893-10	PGD0893-11
Your Reference			MB1_a	MB2	MB3	MB4	MB5
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Copper*	mg/kg	1.0	1.9	38	64	3.2	46
Mercury*	mg/kg	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nickel*	mg/kg	1.0	<1.0	3.1	3.8	<1.0	2.6
Lead*	mg/kg	1.0	3.2	62	86	5.0	79
Zinc*	mg/kg	1.0	8.7	260	260	12	280

Envirolab ID	Units	PQL	PGD0893-12	PGD0893-13	PGD0893-14	PGD0893-15	PGD0893-16
Your Reference			MB6	AP1	AP2	AP3	CB1_1
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Copper*	mg/kg	1.0	3.4	2.4	16	3.2	36
Mercury*	mg/kg	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nickel*	mg/kg	1.0	<1.0	<1.0	1.0	<1.0	2.2
Lead*	mg/kg	1.0	4.9	2.6	21	3.2	42
Zinc*	mg/kg	1.0	17	6.6	120	9.8	130

Envirolab ID	Units	PQL	PGD0893-17	PGD0893-18	PGD0893-19	PGD0893-20
Your Reference			CB1_2	CB1_3	CB2	CB3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025
Copper*	mg/kg	1.0	30	37	43	13
Mercury*	mg/kg	0.10	<0.10	<0.10	<0.10	<0.10
Nickel*	mg/kg	1.0	1.9	2.1	2.5	<1.0
Lead*	mg/kg	1.0	37	41	56	17
Zinc*	mg/kg	1.0	120	140	200	56

Certificate of Analysis PGD0893

Simultaneously Extractable Bioavailable Metals (SEM) & AVS (Soil) - Analysed By Envirolab Services Sydney

Envirolab ID	Units	PQL	PGD0893-01	PGD0893-02	PGD0893-03	PGD0893-04	PGD0893-05
Your Reference			EQ1	EQ2_1	EQ2_2	EQ3_3	EQ3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Acid Volatile Sulfide (AVS)	µmole/g	0.50	7.3	0.92	<0.50	<0.50	<0.50

Envirolab ID	Units	PQL	PGD0893-06	PGD0893-07	PGD0893-08	PGD0893-09	PGD0893-10
Your Reference			MB1_a	MB1_b	MB2	MB3	MB4
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Acid Volatile Sulfide (AVS)	µmole/g	0.50	<0.50	<0.50	23	<0.50	1.4

Envirolab ID	Units	PQL	PGD0893-11	PGD0893-12	PGD0893-13	PGD0893-14	PGD0893-15
Your Reference			MB5	MB6	AP1	AP2	AP3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Acid Volatile Sulfide (AVS)	µmole/g	0.50	13	5.3	<0.50	0.93	5.2

Envirolab ID	Units	PQL	PGD0893-16	PGD0893-17	PGD0893-18	PGD0893-19	PGD0893-20
Your Reference			CB1_1	CB1_2	CB1_3	CB2	CB3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Acid Volatile Sulfide (AVS)	µmole/g	0.50	<0.50	0.63	5.2	1.4	0.62

Certificate of Analysis PGD0893

Inorganics - Carbon, Nitrogen and Sulfur Species (Soil)

Envirolab ID	Units	PQL	PGD0893-01	PGD0893-02	PGD0893-03	PGD0893-04	PGD0893-05
Your Reference			EQ1	EQ2_1	EQ2_2	EQ3_3	EQ3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Total Organic Carbon	%	0.010	2.4	0.72	0.67	0.44	0.88

Envirolab ID	Units	PQL	PGD0893-06	PGD0893-08	PGD0893-09	PGD0893-10	PGD0893-11
Your Reference			MB1_a	MB2	MB3	MB4	MB5
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Total Organic Carbon	%	0.010	0.16	8.6	3.7	0.19	3.6

Envirolab ID	Units	PQL	PGD0893-12	PGD0893-13	PGD0893-14	PGD0893-15	PGD0893-16
Your Reference			MB6	AP1	AP2	AP3	CB1_1
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Total Organic Carbon	%	0.010	0.23	0.16	3.0	0.21	2.4

Envirolab ID	Units	PQL	PGD0893-17	PGD0893-18	PGD0893-19	PGD0893-20	PGD0893-22
Your Reference			CB1_2	CB1_3	CB2	CB3	Trip blank
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Total Organic Carbon	%	0.010	2.4	2.3	2.9	0.86	<0.010

Certificate of Analysis PGD0893

Inorganics - Carbon, Nitrogen and Sulfur Species (Water)

Envirolab ID	Units	PQL	PGD0893-21
Your Reference			Rinsate
Date Sampled			10/04/2025
Total Organic Carbon	mg/L	1.0	1.4

Inorganics - Speciated Cr (III/VI) and Fe (II/III) (Water)

Envirolab ID	Units	PQL	PGD0893-21	PGD0893-23
Your Reference			Rinsate	Elutriate blank
Date Sampled			10/04/2025	10/04/2025
Hexavalent Chromium	mg/L	0.0050	<0.0050	<0.050 [1]
Hexavalent Chromium (Total)	mg/L	0.0050	<0.0050	[NA]
Trivalent Chromium	mg/L	0.0050	<0.0050	<0.050

Inorganics - Nutrients (Water)

Envirolab ID	Units	PQL	PGD0893-21	PGD0893-23
Your Reference			Rinsate	Elutriate blank
Date Sampled			10/04/2025	10/04/2025
Ammonia as N	mg/L	0.0050	<0.0050	0.022
Nitrate as N	mg/L	0.0050	<0.0050	<0.0050
Nitrate as NO3 by calculation	mg/L	0.020	<0.020	<0.020
Nitrite as N	mg/L	0.0050	<0.0050	<0.0050
Nitrite as NO2 by calculation	mg/L	0.020	<0.020	<0.020
NOx as N	mg/L	0.0050	<0.0050	<0.0050
TKN as N by calculation	mg/L	0.10	<0.10	0.54
Organic Nitrogen by calc.	mg/L	0.10	<0.10	0.52
Total Nitrogen	mg/L	0.10	<0.10	0.54
Phosphate as P	mg/L	0.0050	<0.0050	0.014

Inorganics - General Chemical Parameters (Soil)

Envirolab ID	Units	PQL	PGD0893-01	PGD0893-02	PGD0893-03	PGD0893-04	PGD0893-05
Your Reference			EQ1	EQ2_1	EQ2_2	EQ3_3	EQ3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Hexavalent Chromium	mg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trivalent Chromium	mg/kg	1.0	51	19	22	22	25

Envirolab ID	Units	PQL	PGD0893-06	PGD0893-07	PGD0893-08	PGD0893-09	PGD0893-10
Your Reference			MB1_a	MB1_b	MB2	MB3	MB4
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Hexavalent Chromium	mg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trivalent Chromium	mg/kg	1.0	2.5	4.4	65	74	2.8

Envirolab ID	Units	PQL	PGD0893-11	PGD0893-12	PGD0893-13	PGD0893-14	PGD0893-15
Your Reference			MB5	MB6	AP1	AP2	AP3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Hexavalent Chromium	mg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trivalent Chromium	mg/kg	1.0	75	4.2	2.0	35	3.2

Envirolab ID	Units	PQL	PGD0893-16	PGD0893-17	PGD0893-18	PGD0893-19	PGD0893-20
Your Reference			CB1_1	CB1_2	CB1_3	CB2	CB3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Hexavalent Chromium	mg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trivalent Chromium	mg/kg	1.0	43	44	42	54	16

Envirolab ID	Units	PQL	PGD0893-22
Your Reference			Trip blank
Date Sampled			10/04/2025
Hexavalent Chromium	mg/kg	1.0	<1.0
Trivalent Chromium	mg/kg	1.0	1.0

Certificate of Analysis PGD0893

Inorganics - Moisture (Soil)

Envirolab ID	Units	PQL	PGD0893-01	PGD0893-02	PGD0893-03	PGD0893-04	PGD0893-05
Your Reference			EQ1	EQ2_1	EQ2_2	EQ3_3	EQ3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Moisture	%	0.10	55	33	30	32	41

Envirolab ID	Units	PQL	PGD0893-06	PGD0893-07	PGD0893-08	PGD0893-09	PGD0893-10
Your Reference			MB1_a	MB1_b	MB2	MB3	MB4
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Moisture	%	0.10	20	23	76	67	29

Envirolab ID	Units	PQL	PGD0893-11	PGD0893-12	PGD0893-13	PGD0893-14	PGD0893-15
Your Reference			MB5	MB6	AP1	AP2	AP3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Moisture	%	0.10	69	24	23	55	26

Envirolab ID	Units	PQL	PGD0893-16	PGD0893-17	PGD0893-18	PGD0893-19	PGD0893-20
Your Reference			CB1_1	CB1_2	CB1_3	CB2	CB3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Moisture	%	0.10	58	57	64	65	40

Envirolab ID	Units	PQL	PGD0893-22
Your Reference			Trip blank
Date Sampled			10/04/2025
Moisture	%	0.10	0.21

NAGD Elutriate Inorganics - SW (Soil)

Envirolab ID	Units	PQL	PGD0893-01	PGD0893-02	PGD0893-03	PGD0893-04	PGD0893-05
Your Reference			EQ1	EQ2_1	EQ2_2	EQ3_3	EQ3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Ammonia as N	mg/L	0.0050	0.43	0.32	0.38	0.48	2.9
Ammonium (NH4+) as N by calculation	mg/L	0.0050	0.43	0.32	0.38	0.48	2.9
Nitrate as N	mg/L	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Nitrite as N	mg/L	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Total Nitrogen	mg/L	0.50	0.80	0.69	0.87	0.92	4.9
NOx as N	mg/L	0.025	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Phosphate as P	mg/L	0.0050	0.020	0.018	0.024	0.028	<0.0050
TKN as N by calculation	mg/L	0.10	0.80	0.69	0.87	0.91	4.9
Free Ammonia (unionised) as N by calculation	mg/L	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.011
Hexavalent Chromium	mg/L	0.0050	<0.050 [1]	<0.050 [1]	<0.050 [1]	<0.050 [1]	<0.050 [1]
Total Phosphorus	mg/L	0.010	0.082	0.055	0.053	0.079	0.079

Envirolab ID	Units	PQL	PGD0893-06	PGD0893-07	PGD0893-08	PGD0893-09	PGD0893-10
Your Reference			MB1_a	MB1_b	MB2	MB3	MB4
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Ammonia as N	mg/L	0.0050	0.40	0.49	0.97	0.27	2.3
Ammonium (NH4+) as N by calculation	mg/L	0.0050	0.40	0.49	0.97	0.27	2.3
Nitrate as N	mg/L	0.0050	0.0097	<0.0050	0.0079	<0.0050	<0.0050
Nitrite as N	mg/L	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Total Nitrogen	mg/L	0.50	0.98	1.1	1.7	0.95	4.0
NOx as N	mg/L	0.025	0.012	<0.0050	0.0079	<0.0050	<0.0050
Phosphate as P	mg/L	0.0050	0.042	0.047	0.017	0.046	0.0061
TKN as N by calculation	mg/L	0.10	0.97	1.1	1.7	0.95	4.0
Free Ammonia (unionised) as N by calculation	mg/L	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0090
Hexavalent Chromium	mg/L	0.0050	<0.050 [1]	<0.050 [1]	<0.050 [1]	<0.050 [1]	<0.050 [1]
Total Phosphorus	mg/L	0.010	0.063	0.068	0.049	0.085	0.10

Envirolab ID	Units	PQL	PGD0893-11	PGD0893-12	PGD0893-13	PGD0893-14	PGD0893-15
Your Reference			MB5	MB6	AP1	AP2	AP3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Ammonia as N	mg/L	0.0050	0.37	0.80	0.44	0.46	0.44
Ammonium (NH4+) as N by calculation	mg/L	0.0050	0.37	0.80	0.44	0.46	0.44
Nitrate as N	mg/L	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Nitrite as N	mg/L	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Total Nitrogen	mg/L	0.50	1.0	1.4	1.4	1.1	0.95
NOx as N	mg/L	0.025	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Phosphate as P	mg/L	0.0050	0.052	<0.0050	<0.0050	0.077	<0.0050
TKN as N by calculation	mg/L	0.10	0.99	1.4	1.4	1.1	0.95
Free Ammonia (unionised) as N by calculation	mg/L	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Hexavalent Chromium	mg/L	0.0050	<0.050 [1]	<0.050 [1]	<0.050 [1]	<0.050 [1]	<0.050 [1]
Total Phosphorus	mg/L	0.010	0.14	0.046	0.12	0.10	0.041

Envirolab ID	Units	PQL	PGD0893-16	PGD0893-17	PGD0893-18	PGD0893-19	PGD0893-20
Your Reference			CB1_1	CB1_2	CB1_3	CB2	CB3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Ammonia as N	mg/L	0.0050	0.56	0.47	0.42	0.43	0.34
Ammonium (NH4+) as N by calculation	mg/L	0.0050	0.56	0.47	0.42	0.43	0.34

NAGD Elutriate Inorganics - SW (Soil)

Envirolab ID	Units	PQL	PGD0893-16	PGD0893-17	PGD0893-18	PGD0893-19	PGD0893-20
Your Reference			CB1_1	CB1_2	CB1_3	CB2	CB3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Nitrate as N	mg/L	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Nitrite as N	mg/L	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Total Nitrogen	mg/L	0.50	1.2	1.1	1.0	1.0	0.89
NOx as N	mg/L	0.025	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Phosphate as P	mg/L	0.0050	0.037	0.062	0.048	0.042	0.053
TKN as N by calculation	mg/L	0.10	1.2	1.1	1.0	1.0	0.89
Free Ammonia (unionised) as N by calculation	mg/L	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Hexavalent Chromium	mg/L	0.0050	<0.050 [1]	<0.050 [1]	<0.050 [1]	<0.050 [1]	<0.050 [1]
Total Phosphorus	mg/L	0.010	0.071	0.10	0.089	0.078	0.083

PFAS Extended List (Soil) - Analysed By Envirolab Services Sydney

Envirolab ID	Units	PQL	PGD0893-01	PGD0893-02	PGD0893-03	PGD0893-04	PGD0893-05
Your Reference			EQ1	EQ2_1	EQ2_2	EQ3_3	EQ3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Perfluorobutanesulfonic acid (PFBS)	µg/kg	0.10	<0.20 [10]	<0.10	<0.10	<0.10	<0.10
Perfluoropentanesulfonic acid (PFPeS)	µg/kg	0.10	<0.20 [10]	<0.10	<0.10	<0.10	<0.10
Perfluorohexanesulfonic acid (PFHxS)	µg/kg	0.10	<0.20 [10]	<0.10	<0.10	<0.10	<0.10
Perfluoroheptanesulfonic acid (PFHpS)	µg/kg	0.10	<0.20 [10]	<0.10	<0.10	<0.10	<0.10
Perfluorooctanesulfonic acid (PFOS)	µg/kg	0.10	1.5 [10]	0.60	0.45	0.37	0.88
Perfluorodecanesulfonic acid (PFDS)	µg/kg	0.20	<0.40 [10]	<0.20	<0.20	<0.20	<0.20
Perfluorobutanoic acid (PFBA)	µg/kg	0.20	<0.40 [10]	<0.20	<0.20	<0.20	<0.20
Perfluoropentanoic acid (PFPeA)	µg/kg	0.20	<0.40 [10]	<0.20	<0.20	<0.20	<0.20
Perfluorohexanoic acid (PFHxA)	µg/kg	0.10	<0.20 [10]	<0.10	<0.10	<0.10	<0.10
Perfluoroheptanoic acid (PFHpA)	µg/kg	0.10	<0.20 [10]	<0.10	<0.10	<0.10	<0.10
Perfluorooctanoic acid (PFOA)	µg/kg	0.10	<0.20 [10]	<0.10	<0.10	<0.10	<0.10
Perfluorononanoic acid (PFNA)	µg/kg	0.10	<0.20 [10]	<0.10	<0.10	<0.10	<0.10
Perfluorodecanoic acid (PFDA)	µg/kg	0.50	<1.0 [10]	<0.50	<0.50	<0.50	<0.50
Perfluoroundecanoic acid (PFUnDA)	µg/kg	0.50	<1.0 [10]	<0.50	<0.50	<0.50	<0.50
Perfluorododecanoic acid (PFDoDA)	µg/kg	0.50	<1.0 [10]	<0.50	<0.50	<0.50	<0.50
Perfluorotridecanoic acid (PFTrDA)	µg/kg	0.50	<1.0 [10]	<0.50	<0.50	<0.50	<0.50
Perfluorotetradecanoic acid (PFTeDA)	µg/kg	5.0	<10 [10]	<5.0	<5.0	<5.0	<5.0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/kg	0.10	<0.20 [10]	<0.10	<0.10	<0.10	<0.10
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/kg	0.10	<0.20 [10]	<0.10	<0.10	<0.10	<0.10
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/kg	0.20	<0.40 [10]	<0.20	<0.20	<0.20	<0.20
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/kg	0.20	<0.40 [10]	<0.20	<0.20	<0.20	<0.20
Perfluorooctane sulfonamide (FOSA)	µg/kg	1.0	<2.0 [10]	<1.0	<1.0	<1.0	<1.0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/kg	1.0	<2.0 [10]	<1.0	<1.0	<1.0	<1.0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/kg	1.0	<2.0 [10]	<1.0	<1.0	<1.0	<1.0
N-Methyl perfluorooctane sulfonamidoethanol	µg/kg	1.0	<2.0 [10]	<1.0	<1.0	<1.0	<1.0
N-Ethyl perfluorooctane sulfonamidoethanol	µg/kg	5.0	<10 [10]	<5.0	<5.0	<5.0	<5.0
N-Methyl perfluorooctane sulfonamidoacetic acid	µg/kg	0.20	<0.40 [10]	<0.20	<0.20	<0.20	<0.20
N-Ethyl perfluorooctane sulfonamidoacetic acid	µg/kg	0.20	<0.40 [10]	<0.20	<0.20	<0.20	<0.20
Surrogate 13C8 PFOS	%		*99.4*	*103*	*100*	*103*	*98.6*
Surrogate 13C2 PFOA	%		*98.9*	*98.4*	*96.9*	*99.1*	*96.3*
Total +ve PFHxS+PFOS	µg/kg	0.10	1.5	0.60	0.45	0.37	0.88
Total +ve PFOA+PFOS	µg/kg	0.10	1.5	0.60	0.45	0.37	0.88
Total +ve PFAS	µg/kg	0.10	1.5	0.60	0.45	0.37	0.88
Extraction Internal Standard 13C3 PFBS	%		*77.8*	*84.1*	*86.2*	*83.0*	*81.0*
Extraction Internal Standard 18O2 PFHxS	%		*81.9*	*86.1*	*88.0*	*89.9*	*81.5*
Extraction Internal Standard 13C4 PFOS	%		*80.8*	*83.7*	*86.5*	*86.4*	*83.6*
Extraction Internal Standard 13C4 PFBA	%		*73.2*	*78.4*	*81.3*	*82.8*	*75.3*
Extraction Internal Standard 13C3 PFPeA	%		*75.6*	*79.4*	*82.7*	*83.0*	*77.6*
Extraction Internal Standard 13C2 PFHxA	%		*83.2*	*80.4*	*87.9*	*86.2*	*80.8*
Extraction Internal Standard 13C4 PFHpA	%		*81.3*	*82.2*	*85.8*	*88.2*	*82.1*
Extraction Internal Standard 13C4 PFOA	%		*80.8*	*84.4*	*87.1*	*88.4*	*83.6*
Extraction Internal Standard 13C5 PFNA	%		*82.4*	*80.4*	*89.2*	*88.8*	*80.1*
Extraction Internal Standard 13C2 PFDA	%		*83.3*	*81.7*	*85.5*	*86.0*	*79.9*

PFAS Extended List (Soil) - Analysed By Envirolab Services Sydney

Envirolab ID	Units	PQL	PGD0893-01	PGD0893-02	PGD0893-03	PGD0893-04	PGD0893-05
Your Reference			EQ1	EQ2_1	EQ2_2	EQ3_3	EQ3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Extraction Internal Standard 13C2 PFUnDA	%		*78.9*	*78.1*	*79.9*	*88.2*	*80.7*
Extraction Internal Standard 13C2 PFDoDA	%		*85.0*	*77.8*	*86.6*	*94.3*	*84.0*
Extraction Internal Standard 13C2 PFTeDA	%		*91.6*	*102*	*106*	*105*	*98.8*
Extraction Internal Standard 13C2 4:2FTS	%		*49.2*	*57.2*	*57.8*	*59.8*	*56.4*
Extraction Internal Standard 13C2 6:2FTS	%		*59.8*	*64.8*	*67.6*	*73.6*	*62.8*
Extraction Internal Standard 13C2 8:2FTS	%		*78.7*	*80.3*	*83.5*	*87.1*	*83.1*
Extraction Internal Standard 13C8 FOSA	%		*80.4*	*85.0*	*89.6*	*91.8*	*85.6*
Extraction Internal Standard d3 N MeFOSA	%		*76.1*	*85.2*	*84.7*	*87.5*	*83.8*
Extraction Internal Standard d5 N EtFOSA	%		*77.0*	*83.8*	*85.6*	*88.2*	*82.5*
Extraction Internal Standard d7 N MeFOSE	%		*79.8*	*80.2*	*91.1*	*90.6*	*79.3*
Extraction Internal Standard d9 N EtFOSE	%		*78.9*	*83.9*	*83.6*	*87.3*	*80.8*
Extraction Internal Standard d3 N MeFOSAA	%		*87.4*	*89.1*	*97.6*	*102*	*92.5*
Extraction Internal Standard d5 N EtFOSAA	%		*72.3*	*76.2*	*75.8*	*88.1*	*78.3*

Envirolab ID	Units	PQL	PGD0893-06	PGD0893-07	PGD0893-08	PGD0893-09	PGD0893-10
Your Reference			MB1_a	MB1_b	MB2	MB3	MB4
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Perfluorobutanesulfonic acid (PFBS)	µg/kg	0.10	<0.10	<0.10	<0.40 [10]	<0.30 [10]	<0.10
Perfluoropentanesulfonic acid (PFPeS)	µg/kg	0.10	<0.10	<0.10	<0.40 [10]	<0.30 [10]	<0.10
Perfluorohexanesulfonic acid (PFHxS)	µg/kg	0.10	<0.10	<0.10	<0.40 [10]	<0.30 [10]	0.40
Perfluoroheptanesulfonic acid (PFHpS)	µg/kg	0.10	<0.10	<0.10	<0.40 [10]	<0.30 [10]	<0.10
Perfluorooctanesulfonic acid (PFOS)	µg/kg	0.10	0.21	0.25	2.7 [10]	2.2 [10]	0.41
Perfluorodecanesulfonic acid (PFDS)	µg/kg	0.20	<0.20	<0.20	<0.80 [10]	<0.60 [10]	<0.20
Perfluorobutanoic acid (PFBA)	µg/kg	0.20	<0.20	<0.20	<0.80 [10]	<0.60 [10]	<0.20
Perfluoropentanoic acid (PFPeA)	µg/kg	0.20	<0.20	<0.20	<0.80 [10]	<0.60 [10]	<0.20
Perfluorohexanoic acid (PFHxA)	µg/kg	0.10	<0.10	<0.10	<0.40 [10]	<0.30 [10]	<0.10
Perfluoroheptanoic acid (PFHpA)	µg/kg	0.10	<0.10	<0.10	<0.40 [10]	<0.30 [10]	<0.10
Perfluorooctanoic acid (PFOA)	µg/kg	0.10	<0.10	<0.10	<0.40 [10]	<0.30 [10]	0.15
Perfluorononanoic acid (PFNA)	µg/kg	0.10	<0.10	<0.10	<0.40 [10]	<0.30 [10]	<0.10
Perfluorodecanoic acid (PFDA)	µg/kg	0.50	<0.50	<0.50	<2.0 [10]	<1.5 [10]	<0.50
Perfluoroundecanoic acid (PFUnDA)	µg/kg	0.50	<0.50	<0.50	<2.0 [10]	<1.5 [10]	<0.50
Perfluorododecanoic acid (PFDoDA)	µg/kg	0.50	<0.50	<0.50	<2.0 [10]	<1.5 [10]	<0.50
Perfluorotridecanoic acid (PFTrDA)	µg/kg	0.50	<0.50	<0.50	<2.0 [10]	<1.5 [10]	<0.50
Perfluorotetradecanoic acid (PFTeDA)	µg/kg	5.0	<5.0	<5.0	<20 [10]	<15 [10]	<5.0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/kg	0.10	<0.10	<0.10	<0.40 [10]	<0.30 [10]	<0.10
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/kg	0.10	<0.10	<0.10	<0.40 [10]	<0.30 [10]	<0.10
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/kg	0.20	<0.20	<0.20	<0.80 [10]	<0.60 [10]	<0.20
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/kg	0.20	<0.20	<0.20	<0.80 [10]	<0.60 [10]	<0.20
Perfluorooctane sulfonamide (FOSA)	µg/kg	1.0	<1.0	<1.0	<4.0 [10]	<3.0 [10]	<1.0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/kg	1.0	<1.0	<1.0	<4.0 [10]	<3.0 [10]	<1.0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/kg	1.0	<1.0	<1.0	<4.0 [10]	<3.0 [10]	<1.0
N-Methyl perfluorooctane sulfonamidoethanol	µg/kg	1.0	<1.0	<1.0	<4.0 [10]	<3.0 [10]	<1.0
N-Ethyl perfluorooctane sulfonamidoethanol	µg/kg	5.0	<5.0	<5.0	<20 [10]	<15 [10]	<5.0
N-Methyl perfluorooctane sulfonamidoacetic acid	µg/kg	0.20	<0.20	<0.20	<0.80 [10]	<0.60 [10]	<0.20

Certificate of Analysis PGD0893

PFAS Extended List (Soil) - Analysed By Envirolab Services Sydney

Envirolab ID	Units	PQL	PGD0893-06	PGD0893-07	PGD0893-08	PGD0893-09	PGD0893-10
Your Reference			MB1_a	MB1_b	MB2	MB3	MB4
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
N-Ethyl perfluorooctane sulfonamidoacetic acid	µg/kg	0.20	<0.20	<0.20	<0.80 [10]	<0.60 [10]	<0.20
Surrogate 13C8 PFOS	%		*99.2*	*102*	*98.3*	*101*	*97.1*
Surrogate 13C2 PFOA	%		*101*	*103*	*100*	*98.8*	*94.2*
Total +ve PFHxS+PFOS	µg/kg	0.10	0.21	0.25	2.7	2.2	0.81
Total +ve PFOA+PFOS	µg/kg	0.10	0.21	0.25	2.7	2.2	0.56
Total +ve PFAS	µg/kg	0.10	0.21	0.25	2.7	2.2	0.96
Extraction Internal Standard 13C3 PFBS	%		*85.8*	*90.4*	*72.8*	*72.2*	*87.0*
Extraction Internal Standard 18O2 PFHxS	%		*86.4*	*89.4*	*76.9*	*76.8*	*88.9*
Extraction Internal Standard 13C4 PFOS	%		*86.8*	*88.9*	*74.1*	*73.4*	*92.6*
Extraction Internal Standard 13C4 PFBA	%		*81.5*	*87.8*	*63.3*	*64.0*	*82.8*
Extraction Internal Standard 13C3 PFPeA	%		*81.9*	*87.2*	*71.1*	*68.7*	*85.8*
Extraction Internal Standard 13C2 PFHxA	%		*85.4*	*91.6*	*75.5*	*76.2*	*89.7*
Extraction Internal Standard 13C4 PFHpA	%		*83.1*	*91.3*	*75.4*	*75.3*	*89.9*
Extraction Internal Standard 13C4 PFOA	%		*85.0*	*93.2*	*74.3*	*75.2*	*90.9*
Extraction Internal Standard 13C5 PFNA	%		*88.1*	*93.3*	*71.8*	*75.3*	*89.7*
Extraction Internal Standard 13C2 PFDA	%		*85.5*	*89.2*	*70.0*	*73.9*	*86.6*
Extraction Internal Standard 13C2 PFUnDA	%		*84.4*	*90.8*	*30.2*	*68.1*	*79.7*
Extraction Internal Standard 13C2 PFDoDA	%		*80.2*	*96.7*	*35.1*	*75.4*	*91.6*
Extraction Internal Standard 13C2 PFTeDA	%		*105*	*115*	*38.4*	*89.1*	*110*
Extraction Internal Standard 13C2 4:2FTS	%		*60.9*	*65.3*	*48.9*	*45.2*	*66.2*
Extraction Internal Standard 13C2 6:2FTS	%		*70.8*	*73.9*	*51.5*	*55.0*	*72.1*
Extraction Internal Standard 13C2 8:2FTS	%		*81.4*	*83.0*	*70.2*	*70.9*	*92.1*
Extraction Internal Standard 13C8 FOSA	%		*87.2*	*95.2*	*57.1*	*75.6*	*94.0*
Extraction Internal Standard d3 N MeFOSA	%		*82.7*	*90.5*	*51.4*	*73.9*	*90.4*
Extraction Internal Standard d5 N EtFOSA	%		*88.1*	*91.8*	*58.1*	*74.1*	*91.4*
Extraction Internal Standard d7 N MeFOSE	%		*81.2*	*88.2*	*67.0*	*74.5*	*84.2*
Extraction Internal Standard d9 N EtFOSE	%		*84.3*	*88.9*	*61.2*	*73.4*	*90.3*
Extraction Internal Standard d3 N MeFOSAA	%		*92.7*	*106*	*50.6*	*76.3*	*98.7*
Extraction Internal Standard d5 N EtFOSAA	%		*80.0*	*90.5*	*32.8*	*63.8*	*79.0*

Envirolab ID	Units	PQL	PGD0893-11	PGD0893-12	PGD0893-13	PGD0893-14	PGD0893-15
Your Reference			MB5	MB6	AP1	AP2	AP3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Perfluorobutanesulfonic acid (PFBS)	µg/kg	0.10	<0.30 [10]	<0.10	<0.10	<0.30 [10]	<0.10
Perfluoropentanesulfonic acid (PFPeS)	µg/kg	0.10	<0.30 [10]	<0.10	<0.10	<0.30 [10]	<0.10
Perfluorohexanesulfonic acid (PFHxS)	µg/kg	0.10	<0.30 [10]	1.8	<0.10	<0.30 [10]	0.31
Perfluoroheptanesulfonic acid (PFHpS)	µg/kg	0.10	<0.30 [10]	0.13	<0.10	<0.30 [10]	<0.10
Perfluorooctanesulfonic acid (PFOS)	µg/kg	0.10	2.3 [10]	3.0	0.66	0.62 [10]	0.34
Perfluorodecanesulfonic acid (PFDS)	µg/kg	0.20	<0.60 [10]	<0.20	<0.20	<0.60 [10]	<0.20
Perfluorobutanoic acid (PFBA)	µg/kg	0.20	<0.60 [10]	<0.20	<0.20	<0.60 [10]	<0.20
Perfluoropentanoic acid (PFPeA)	µg/kg	0.20	<0.60 [10]	<0.20	<0.20	<0.60 [10]	<0.20
Perfluorohexanoic acid (PFHxA)	µg/kg	0.10	<0.30 [10]	<0.10	<0.10	<0.30 [10]	<0.10
Perfluoroheptanoic acid (PFHpA)	µg/kg	0.10	<0.30 [10]	<0.10	<0.10	<0.30 [10]	<0.10
Perfluorooctanoic acid (PFOA)	µg/kg	0.10	<0.30 [10]	0.70	0.22	<0.30 [10]	0.20
Perfluorononanoic acid (PFNA)	µg/kg	0.10	<0.30 [10]	<0.10	<0.10	<0.30 [10]	<0.10
Perfluorodecanoic acid (PFDA)	µg/kg	0.50	<1.5 [10]	<0.50	<0.50	<1.5 [10]	<0.50

PFAS Extended List (Soil) - Analysed By Envirolab Services Sydney

Envirolab ID	Units	PQL	PGD0893-11	PGD0893-12	PGD0893-13	PGD0893-14	PGD0893-15
Your Reference			MB5	MB6	AP1	AP2	AP3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Perfluoroundecanoic acid (PFUnDA)	µg/kg	0.50	<1.5 [10]	<0.50	<0.50	<1.5 [10]	<0.50
Perfluorododecanoic acid (PFDoDA)	µg/kg	0.50	<1.5 [10]	<0.50	<0.50	<1.5 [10]	<0.50
Perfluorotridecanoic acid (PFTrDA)	µg/kg	0.50	<1.5 [10]	<0.50	<0.50	<1.5 [10]	<0.50
Perfluorotetradecanoic acid (PFTeDA)	µg/kg	5.0	<15 [10]	<5.0	<5.0	<15 [10]	<5.0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/kg	0.10	<0.30 [10]	<0.10	<0.10	<0.30 [10]	<0.10
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/kg	0.10	<0.30 [10]	<0.10	<0.10	<0.30 [10]	<0.10
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/kg	0.20	<0.60 [10]	<0.20	<0.20	<0.60 [10]	<0.20
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/kg	0.20	<0.60 [10]	<0.20	<0.20	<0.60 [10]	<0.20
Perfluorooctane sulfonamide (FOSA)	µg/kg	1.0	<3.0 [10]	<1.0	<1.0	<3.0 [10]	<1.0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/kg	1.0	<3.0 [10]	<1.0	<1.0	<3.0 [10]	<1.0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/kg	1.0	<3.0 [10]	<1.0	<1.0	<3.0 [10]	<1.0
N-Methyl perfluorooctane sulfonamidoethanol	µg/kg	1.0	<3.0 [10]	<1.0	<1.0	<3.0 [10]	<1.0
N-Ethyl perfluorooctane sulfonamidoethanol	µg/kg	5.0	<15 [10]	<5.0	<5.0	<15 [10]	<5.0
N-Methyl perfluorooctane sulfonamidoacetic acid	µg/kg	0.20	<0.60 [10]	<0.20	<0.20	<0.60 [10]	<0.20
N-Ethyl perfluorooctane sulfonamidoacetic acid	µg/kg	0.20	<0.60 [10]	<0.20	<0.20	<0.60 [10]	<0.20
Surrogate 13C8 PFOS	%		*99.0*	*95.4*	*104*	*98.5*	*99.8*
Surrogate 13C2 PFOA	%		*101*	*98.4*	*99.3*	*102*	*99.7*
Total +ve PFHxS+PFOS	µg/kg	0.10	2.3	4.8	0.66	0.62	0.65
Total +ve PFOA+PFOS	µg/kg	0.10	2.3	3.7	0.88	0.62	0.54
Total +ve PFAS	µg/kg	0.10	2.3	5.6	0.88	0.62	0.85
Extraction Internal Standard 13C3 PFBS	%		*74.4*	*88.4*	*85.8*	*74.5*	*88.6*
Extraction Internal Standard 18O2 PFHxS	%		*76.1*	*90.7*	*87.4*	*73.8*	*85.0*
Extraction Internal Standard 13C4 PFOS	%		*74.6*	*90.0*	*85.2*	*75.8*	*88.8*
Extraction Internal Standard 13C4 PFBA	%		*66.8*	*84.4*	*84.6*	*60.9*	*84.5*
Extraction Internal Standard 13C3 PFPeA	%		*70.6*	*86.7*	*83.7*	*68.8*	*85.7*
Extraction Internal Standard 13C2 PFHxA	%		*71.1*	*90.4*	*92.7*	*74.4*	*88.3*
Extraction Internal Standard 13C4 PFHpA	%		*74.2*	*87.8*	*86.1*	*72.2*	*89.0*
Extraction Internal Standard 13C4 PFOA	%		*75.2*	*90.2*	*90.4*	*74.5*	*93.0*
Extraction Internal Standard 13C5 PFNA	%		*75.6*	*92.7*	*90.9*	*74.0*	*95.9*
Extraction Internal Standard 13C2 PFDA	%		*75.5*	*87.3*	*89.6*	*73.8*	*92.7*
Extraction Internal Standard 13C2 PFUnDA	%		*78.3*	*98.0*	*98.1*	*83.2*	*104*
Extraction Internal Standard 13C2 PFDoDA	%		*76.7*	*98.4*	*94.2*	*75.8*	*101*
Extraction Internal Standard 13C2 PFTeDA	%		*88.4*	*115*	*119*	*91.0*	*122*
Extraction Internal Standard 13C2 4:2FTS	%		*45.6*	*75.5*	*76.9*	*55.7*	*74.9*
Extraction Internal Standard 13C2 6:2FTS	%		*55.5*	*78.6*	*78.6*	*61.6*	*80.1*
Extraction Internal Standard 13C2 8:2FTS	%		*70.6*	*87.1*	*91.6*	*74.5*	*91.2*
Extraction Internal Standard 13C8 FOSA	%		*75.4*	*91.9*	*93.2*	*74.9*	*92.4*
Extraction Internal Standard d3 N MeFOSA	%		*73.9*	*85.3*	*90.2*	*74.5*	*90.7*
Extraction Internal Standard d5 N EtFOSA	%		*73.1*	*92.9*	*88.7*	*73.1*	*93.2*
Extraction Internal Standard d7 N MeFOSE	%		*72.1*	*88.8*	*87.9*	*69.7*	*89.1*
Extraction Internal Standard d9 N EtFOSE	%		*74.2*	*86.6*	*91.6*	*69.7*	*90.4*
Extraction Internal Standard d3 N MeFOSAA	%		*83.7*	*110*	*94.8*	*87.3*	*114*
Extraction Internal Standard d5 N EtFOSAA	%		*71.3*	*92.4*	*92.4*	*78.8*	*96.5*

PFAS Extended List (Soil) - Analysed By Envirolab Services Sydney

Envirolab ID	Units	PQL	PGD0893-16	PGD0893-17	PGD0893-18	PGD0893-19	PGD0893-20
Your Reference			CB1_1	CB1_2	CB1_3	CB2	CB3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Perfluorobutanesulfonic acid (PFBS)	µg/kg	0.10	<0.30 [10]	<0.30 [10]	<0.30 [10]	<0.30 [10]	<0.10
Perfluoropentanesulfonic acid (PFPeS)	µg/kg	0.10	<0.30 [10]	<0.30 [10]	<0.30 [10]	<0.30 [10]	<0.10
Perfluorohexanesulfonic acid (PFHxS)	µg/kg	0.10	<0.30 [10]	<0.30 [10]	<0.30 [10]	<0.30 [10]	<0.10
Perfluoroheptanesulfonic acid (PFHpS)	µg/kg	0.10	<0.30 [10]	<0.30 [10]	<0.30 [10]	<0.30 [10]	<0.10
Perfluorooctanesulfonic acid (PFOS)	µg/kg	0.10	1.2 [10]	1.2 [10]	1.6 [10]	1.9 [10]	0.68
Perfluorodecanesulfonic acid (PFDS)	µg/kg	0.20	<0.60 [10]	<0.60 [10]	<0.60 [10]	<0.60 [10]	<0.20
Perfluorobutanoic acid (PFBA)	µg/kg	0.20	<0.60 [10]	<0.60 [10]	<0.60 [10]	<0.60 [10]	<0.20
Perfluoropentanoic acid (PFPeA)	µg/kg	0.20	<0.60 [10]	<0.60 [10]	<0.60 [10]	<0.60 [10]	<0.20
Perfluorohexanoic acid (PFHxA)	µg/kg	0.10	<0.30 [10]	<0.30 [10]	<0.30 [10]	<0.30 [10]	<0.10
Perfluoroheptanoic acid (PFHpA)	µg/kg	0.10	<0.30 [10]	<0.30 [10]	<0.30 [10]	<0.30 [10]	<0.10
Perfluorooctanoic acid (PFOA)	µg/kg	0.10	<0.30 [10]	<0.30 [10]	<0.30 [10]	<0.30 [10]	<0.10
Perfluorononanoic acid (PFNA)	µg/kg	0.10	<0.30 [10]	<0.30 [10]	<0.30 [10]	<0.30 [10]	<0.10
Perfluorodecanoic acid (PFDA)	µg/kg	0.50	<1.5 [10]	<1.5 [10]	<1.5 [10]	<1.5 [10]	<0.50
Perfluoroundecanoic acid (PFUnDA)	µg/kg	0.50	<1.5 [10]	<1.5 [10]	<1.5 [10]	<1.5 [10]	<0.50
Perfluorododecanoic acid (PFDoDA)	µg/kg	0.50	<1.5 [10]	<1.5 [10]	<1.5 [10]	<1.5 [10]	<0.50
Perfluorotridecanoic acid (PFTrDA)	µg/kg	0.50	<1.5 [10]	<1.5 [10]	<1.5 [10]	<1.5 [10]	<0.50
Perfluorotetradecanoic acid (PFTeDA)	µg/kg	5.0	<15 [10]	<15 [10]	<15 [10]	<15 [10]	<5.0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/kg	0.10	<0.30 [10]	<0.30 [10]	<0.30 [10]	<0.30 [10]	<0.10
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/kg	0.10	<0.30 [10]	<0.30 [10]	<0.30 [10]	<0.30 [10]	<0.10
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/kg	0.20	<0.60 [10]	<0.60 [10]	<0.60 [10]	<0.60 [10]	<0.20
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/kg	0.20	<0.60 [10]	<0.60 [10]	<0.60 [10]	<0.60 [10]	<0.20
Perfluorooctane sulfonamide (FOSA)	µg/kg	1.0	<3.0 [10]	<3.0 [10]	<3.0 [10]	<3.0 [10]	<1.0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/kg	1.0	<3.0 [10]	<3.0 [10]	<3.0 [10]	<3.0 [10]	<1.0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/kg	1.0	<3.0 [10]	<3.0 [10]	<3.0 [10]	<3.0 [10]	<1.0
N-Methyl perfluorooctane sulfonamidoethanol	µg/kg	1.0	<3.0 [10]	<3.0 [10]	<3.0 [10]	<3.0 [10]	<1.0
N-Ethyl perfluorooctane sulfonamidoethanol	µg/kg	5.0	<15 [10]	<15 [10]	<15 [10]	<15 [10]	<5.0
N-Methyl perfluorooctane sulfonamidoacetic acid	µg/kg	0.20	<0.60 [10]	<0.60 [10]	<0.60 [10]	<0.60 [10]	<0.20
N-Ethyl perfluorooctane sulfonamidoacetic acid	µg/kg	0.20	<0.60 [10]	<0.60 [10]	<0.60 [10]	<0.60 [10]	<0.20
Surrogate 13C8 PFOS	%		*99.4*	*96.2*	*103*	*102*	*95.4*
Surrogate 13C2 PFOA	%		*99.7*	*98.5*	*102*	*99.7*	*104*
Total +ve PFHxS+PFOS	µg/kg	0.10	1.2	1.2	1.6	1.9	0.68
Total +ve PFOA+PFOS	µg/kg	0.10	1.2	1.2	1.6	1.9	0.68
Total +ve PFAS	µg/kg	0.10	1.2	1.2	1.6	1.9	0.68
Extraction Internal Standard 13C3 PFBS	%		*75.3*	*78.7*	*76.1*	*76.8*	*79.1*
Extraction Internal Standard 18O2 PFHxS	%		*79.7*	*80.1*	*77.0*	*76.3*	*80.7*
Extraction Internal Standard 13C4 PFOS	%		*78.2*	*82.2*	*76.7*	*75.7*	*83.8*
Extraction Internal Standard 13C4 PFBA	%		*64.1*	*66.5*	*65.6*	*64.8*	*71.0*
Extraction Internal Standard 13C3 PFPeA	%		*72.2*	*74.4*	*73.4*	*73.1*	*77.0*
Extraction Internal Standard 13C2 PFHxA	%		*76.4*	*78.3*	*76.2*	*76.8*	*82.4*
Extraction Internal Standard 13C4 PFHpA	%		*76.6*	*79.3*	*77.3*	*75.3*	*81.7*
Extraction Internal Standard 13C4 PFOA	%		*77.5*	*79.6*	*75.4*	*79.5*	*79.1*
Extraction Internal Standard 13C5 PFNA	%		*78.6*	*84.1*	*79.6*	*80.3*	*84.3*
Extraction Internal Standard 13C2 PFDA	%		*83.2*	*80.4*	*77.5*	*75.7*	*82.4*

PFAS Extended List (Soil) - Analysed By Envirolab Services Sydney

Envirolab ID	Units	PQL	PGD0893-16	PGD0893-17	PGD0893-18	PGD0893-19	PGD0893-20
Your Reference			CB1_1	CB1_2	CB1_3	CB2	CB3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Extraction Internal Standard 13C2 PFUnDA	%		*86.8*	*88.8*	*85.9*	*86.1*	*84.2*
Extraction Internal Standard 13C2 PFDoDA	%		*90.1*	*86.8*	*90.8*	*87.2*	*93.2*
Extraction Internal Standard 13C2 PFTeDA	%		*100*	*100*	*99.5*	*94.0*	*106*
Extraction Internal Standard 13C2 4:2FTS	%		*57.1*	*59.8*	*60.0*	*58.0*	*64.3*
Extraction Internal Standard 13C2 6:2FTS	%		*63.0*	*66.7*	*64.4*	*64.5*	*66.0*
Extraction Internal Standard 13C2 8:2FTS	%		*78.4*	*77.5*	*75.9*	*79.8*	*77.5*
Extraction Internal Standard 13C8 FOSA	%		*80.8*	*79.1*	*81.8*	*75.6*	*83.4*
Extraction Internal Standard d3 N MeFOSA	%		*79.3*	*77.9*	*78.1*	*75.0*	*79.1*
Extraction Internal Standard d5 N EtFOSA	%		*78.7*	*76.1*	*76.6*	*74.8*	*80.5*
Extraction Internal Standard d7 N MeFOSE	%		*81.0*	*75.2*	*74.8*	*71.8*	*83.1*
Extraction Internal Standard d9 N EtFOSE	%		*76.9*	*77.8*	*77.2*	*74.4*	*82.4*
Extraction Internal Standard d3 N MeFOSAA	%		*94.4*	*96.8*	*95.4*	*94.2*	*100*
Extraction Internal Standard d5 N EtFOSAA	%		*83.2*	*85.3*	*81.6*	*86.7*	*82.1*

Envirolab ID	Units	PQL	PGD0893-22
Your Reference			Trip blank
Date Sampled			10/04/2025
Perfluorobutanesulfonic acid (PFBS)	µg/kg	0.10	<0.10
Perfluoropentanesulfonic acid (PFPeS)	µg/kg	0.10	<0.10
Perfluorohexanesulfonic acid (PFHxS)	µg/kg	0.10	<0.10
Perfluoroheptanesulfonic acid (PFHpS)	µg/kg	0.10	<0.10
Perfluorooctanesulfonic acid (PFOS)	µg/kg	0.10	<0.10
Perfluorodecanesulfonic acid (PFDS)	µg/kg	0.20	<0.20
Perfluorobutanoic acid (PFBA)	µg/kg	0.20	<0.20
Perfluoropentanoic acid (PFPeA)	µg/kg	0.20	<0.20
Perfluorohexanoic acid (PFHxA)	µg/kg	0.10	<0.10
Perfluoroheptanoic acid (PFHpA)	µg/kg	0.10	<0.10
Perfluorooctanoic acid (PFOA)	µg/kg	0.10	<0.10
Perfluorononanoic acid (PFNA)	µg/kg	0.10	<0.10
Perfluorodecanoic acid (PFDA)	µg/kg	0.50	<0.50
Perfluoroundecanoic acid (PFUnDA)	µg/kg	0.50	<0.50
Perfluorododecanoic acid (PFDoDA)	µg/kg	0.50	<0.50
Perfluorotridecanoic acid (PFTrDA)	µg/kg	0.50	<0.50
Perfluorotetradecanoic acid (PFTeDA)	µg/kg	5.0	<5.0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/kg	0.10	<0.10
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/kg	0.10	<0.10
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/kg	0.20	<0.20
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/kg	0.20	<0.20
Perfluorooctane sulfonamide (FOSA)	µg/kg	1.0	<1.0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/kg	1.0	<1.0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/kg	1.0	<1.0
N-Methyl perfluorooctane sulfonamidoethanol	µg/kg	1.0	<1.0
N-Ethyl perfluorooctane sulfonamidoethanol	µg/kg	5.0	<5.0
N-Methyl perfluorooctane sulfonamidoacetic acid	µg/kg	0.20	<0.20

PFAS Extended List (Soil) - Analysed By Envirolab Services Sydney

Envirolab ID	Units	PQL	PGD0893-22
Your Reference			Trip blank
Date Sampled			10/04/2025
N-Ethyl perfluorooctane sulfonamidoacetic acid	µg/kg	0.20	<0.20
Surrogate 13C8 PFOS	%		*97.4*
Surrogate 13C2 PFOA	%		*99.4*
Total +ve PFHxS+PFOS	µg/kg	0.10	<0.10
Total +ve PFOA+PFOS	µg/kg	0.10	<0.10
Total +ve PFAS	µg/kg	0.10	<0.10
Extraction Internal Standard 13C3 PFBS	%		*96.9*
Extraction Internal Standard 18O2 PFHxS	%		*95.9*
Extraction Internal Standard 13C4 PFOS	%		*96.5*
Extraction Internal Standard 13C4 PFBA	%		*98.0*
Extraction Internal Standard 13C3 PFPeA	%		*97.2*
Extraction Internal Standard 13C2 PFHxA	%		*96.2*
Extraction Internal Standard 13C4 PFHpA	%		*95.4*
Extraction Internal Standard 13C4 PFOA	%		*97.4*
Extraction Internal Standard 13C5 PFNA	%		*97.7*
Extraction Internal Standard 13C2 PFDA	%		*92.4*
Extraction Internal Standard 13C2 PFUnDA	%		*106*
Extraction Internal Standard 13C2 PFDoDA	%		*102*
Extraction Internal Standard 13C2 PFTeDA	%		*116*
Extraction Internal Standard 13C2 4:2FTS	%		*101*
Extraction Internal Standard 13C2 6:2FTS	%		*92.4*
Extraction Internal Standard 13C2 8:2FTS	%		*99.4*
Extraction Internal Standard 13C8 FOSA	%		*104*
Extraction Internal Standard d3 N MeFOSA	%		*100*
Extraction Internal Standard d5 N EtFOSA	%		*99.4*
Extraction Internal Standard d7 N MeFOSE	%		*99.1*
Extraction Internal Standard d9 N EtFOSE	%		*94.6*
Extraction Internal Standard d3 N MeFOSAA	%		*118*
Extraction Internal Standard d5 N EtFOSAA	%		*99.8*

PFAS Extended List (Water) - Analysed By Envirolab Services Sydney

Envirolab ID	Units	PQL	PGD0893-21	PGD0893-23
Your Reference			Rinsate	Elutriate blank
Date Sampled			10/04/2025	10/04/2025
Perfluorobutanesulfonic acid (PFBS)	µg/L	0.010	<0.010	<1.0 [13]
Perfluoropentanesulfonic acid (PFPeS)	µg/L	0.010	<0.010	<1.0 [13]
Perfluorohexanesulfonic acid (PFHxS)	µg/L	0.010	<0.010	<1.0 [13]
Perfluoroheptanesulfonic acid (PFHpS)	µg/L	0.010	<0.010	<1.0 [13]
Perfluorooctanesulfonic acid (PFOS)	µg/L	0.010	<0.010	<1.0 [13]
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.020	<0.020	<2.0 [13]
Perfluorobutanoic acid (PFBA)	µg/L	0.020	<0.020	<2.0 [13]
Perfluoropentanoic acid (PFPeA)	µg/L	0.020	<0.020	<2.0 [13]
Perfluorohexanoic acid (PFHxA)	µg/L	0.010	<0.010	<1.0 [13]
Perfluoroheptanoic acid (PFHpA)	µg/L	0.010	<0.010	<1.0 [13]
Perfluorooctanoic acid (PFOA)	µg/L	0.010	<0.010	<1.0 [13]
Perfluorononanoic acid (PFNA)	µg/L	0.010	<0.010	<1.0 [13]
Perfluorodecanoic acid (PFDA)	µg/L	0.020	<0.020	<2.0 [13]
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.020	<0.020	<2.0 [13]
Perfluorododecanoic acid (PFDoDA)	µg/L	0.050	<0.050	<5.0 [13]
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.10	<0.10	<10 [13]
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.50	<0.50	<50 [13]
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.010	<0.010	<1.0 [13]
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.010	<0.010	<1.0 [13]
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.020	<0.020	<2.0 [13]
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.020	<0.020	<2.0 [13]
Perfluorooctane sulfonamide (FOSA)	µg/L	0.10	<0.10	<10 [13]
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.050	<0.050	<5.0 [13]
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.10	<0.10	<10 [13]
N-Methyl perfluorooctane sulfonamidoethanol	µg/L	0.050	<0.050	<5.0 [13]
N-Ethyl perfluorooctane sulfonamidoethanol	µg/L	0.50	<0.50	<50 [13]
N-Methyl perfluorooctane sulfonamidoacetic acid	µg/L	0.020	<0.020	<2.0 [13]
N-Ethyl perfluorooctane sulfonamidoacetic acid	µg/L	0.020	<0.020	<2.0 [13]
Surrogate 13C8 PFOS	%		*99.2*	*106*
Surrogate 13C2 PFOA	%		*99.6*	*119*
Total +ve PFHxS+PFOS	µg/L	0.010	<0.010	<1.0
Total +ve PFOA+PFOS	µg/L	0.010	<0.010	<1.0
Total +ve PFAS	µg/L	0.010	<0.010	<1.0
Extraction Internal Standard 13C3 PFBS	%		*110*	*85.4*
Extraction Internal Standard 18O2 PFHxS	%		*111*	*99.9*
Extraction Internal Standard 13C4 PFOS	%		*101*	*90.7*
Extraction Internal Standard 13C4 PFBA	%		*112*	*108*
Extraction Internal Standard 13C3 PFPeA	%		*107*	*96.4*
Extraction Internal Standard 13C2 PFHxA	%		*107*	*108*
Extraction Internal Standard 13C4 PFHpA	%		*111*	*123*
Extraction Internal Standard 13C4 PFOA	%		*107*	*95.6*
Extraction Internal Standard 13C5 PFNA	%		*105*	*115*
Extraction Internal Standard 13C2 PFDA	%		*101*	*134*

PFAS Extended List (Water) - Analysed By Envirolab Services Sydney

Envirolab ID	Units	PQL	PGD0893-21	PGD0893-23
Your Reference			Rinsate	Elutriate blank
Date Sampled			10/04/2025	10/04/2025
Extraction Internal Standard 13C2 PFUnDA	%		*100*	*154*
Extraction Internal Standard 13C2 PFDoDA	%		*98.0*	*96.4*
Extraction Internal Standard 13C2 PFTeDA	%		*87.0*	*168*
Extraction Internal Standard 13C2 4:2FTS	%		*111*	*77.6*
Extraction Internal Standard 13C2 6:2FTS	%		*120*	*87.3*
Extraction Internal Standard 13C2 8:2FTS	%		*126*	*104*
Extraction Internal Standard 13C8 FOSA	%		*110*	*119*
Extraction Internal Standard d3 N MeFOSA	%		*100*	*142*
Extraction Internal Standard d5 N EtFOSA	%		*93.3*	*136*
Extraction Internal Standard d7 N MeFOSE	%		*105*	*148*
Extraction Internal Standard d9 N EtFOSE	%		*96.5*	*122*
Extraction Internal Standard d3 N MeFOSAA	%		*129*	*111*
Extraction Internal Standard d5 N EtFOSAA	%		*111*	*95.9*

NAGD Seawater Elutriate - PFAS Extended List - Trace Level (Soil) - Analysed By Envirolab Services Sydney

Envirolab ID	Units	PQL	PGD0893-01	PGD0893-02	PGD0893-03	PGD0893-04	PGD0893-05
Your Reference			EQ1	EQ2_1	EQ2_2	EQ3_3	EQ3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Perfluorobutanesulfonic acid (PFBS)	µg/L	0.00040	0.00092	0.00083	0.00085	0.00093	0.00088
Perfluoropentanesulfonic acid (PFPeS)	µg/L	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Perfluorohexanesulfonic acid (PFHxS)	µg/L	0.00020	0.0061	0.0046	0.0043	0.0051	0.0045
Perfluoroheptanesulfonic acid (PFHpS)	µg/L	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Perfluorooctanesulfonic acid (PFOS)	µg/L	0.00020	0.015	0.014	0.013	0.013	0.014
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluorobutanoic acid (PFBA)	µg/L	0.0020	<0.010	<0.010	<0.010	<0.010	<0.010
Perfluoropentanoic acid (PFPeA)	µg/L	0.0020	0.0036	0.0035	0.0039	0.0039	0.0040
Perfluorohexanoic acid (PFHxA)	µg/L	0.00040	0.0035	0.0031	0.0033	0.0034	0.0032
Perfluoroheptanoic acid (PFHpA)	µg/L	0.00040	0.0026	0.0026	0.0022	0.0026	0.0022
Perfluorooctanoic acid (PFOA)	µg/L	0.00020	0.0036	0.0030	0.0031	0.0028	0.0035
Perfluorononanoic acid (PFNA)	µg/L	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Perfluorodecanoic acid (PFDA)	µg/L	0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluorododecanoic acid (PFDoDA)	µg/L	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.050	<0.050	<0.050	<0.050	<0.050	<0.050
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.00040	0.00045	<0.00040	<0.00040	<0.00040	<0.00040
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluorooctane sulfonamide (FOSA)	µg/L	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.050	<0.050	<0.050	<0.050	<0.050	<0.050
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-Methyl perfluorooctane sulfonamidoethanol	µg/L	0.050	<0.050	<0.050	<0.050	<0.050	<0.050
N-Ethyl perfluorooctane sulfonamidoethanol	µg/L	0.50	<0.50	<0.50	<0.50	<0.50	<0.50
N-Methyl perfluorooctane sulfonamidoacetic acid	µg/L	0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
N-Ethyl perfluorooctane sulfonamidoacetic acid	µg/L	0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Surrogate 13C8 PFOS	%		*89.5*	*87.8*	*91.8*	*87.2*	*93.6*
Surrogate 13C2 PFOA	%		*109*	*110*	*115*	*112*	*119*
Extraction Internal Standard 13C3 PFBS	%		*65.0*	*61.0*	*66.0*	*61.0*	*63.0*
Extraction Internal Standard 18O2 PFHxS	%		*74.0*	*72.0*	*77.0*	*74.0*	*78.0*
Extraction Internal Standard 13C4 PFOS	%		*71.0*	*71.0*	*71.0*	*71.0*	*66.0*
Extraction Internal Standard 13C4 PFBA	%		*30.0 [9]*	*26.0 [9]*	*30.0 [9]*	*31.0 [9]*	*26.0 [9]*
Extraction Internal Standard 13C3 PFPeA	%		*54.0*	*52.0*	*53.0*	*56.0*	*56.0*
Extraction Internal Standard 13C2 PFHxA	%		*80.0*	*81.0*	*82.0*	*82.0*	*84.0*
Extraction Internal Standard 13C4 PFHpA	%		*80.0*	*87.0*	*99.0*	*93.0*	*100*
Extraction Internal Standard 13C4 PFOA	%		*90.0*	*79.0*	*78.0*	*88.0*	*86.0*
Extraction Internal Standard 13C5 PFNA	%		*95.0*	*92.0*	*101*	*109*	*98.0*
Extraction Internal Standard 13C2 PFDA	%		*91.0*	*98.0*	*99.0*	*106*	*101*
Extraction Internal Standard 13C2 PFUnDA	%		*91.0*	*92.0*	*103*	*114*	*102*
Extraction Internal Standard 13C2 PFDoDA	%		*77.0*	*76.0*	*74.0*	*70.0*	*83.0*

NAGD Seawater Elutriate - PFAS Extended List - Trace Level (Soil) - Analysed By Envirolab Services Sydney

Envirolab ID	Units	PQL	PGD0893-01	PGD0893-02	PGD0893-03	PGD0893-04	PGD0893-05
Your Reference			EQ1	EQ2_1	EQ2_2	EQ3_3	EQ3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Extraction Internal Standard 13C2 PFTeDA	%		*62.0*	*62.0*	*74.0*	*66.0*	*70.0*
Extraction Internal Standard 13C2 4:2FTS	%		*106*	*122*	*133*	*127*	*127*
Extraction Internal Standard 13C2 6:2FTS	%		*115*	*111*	*120*	*121*	*125*
Extraction Internal Standard 13C2 8:2FTS	%		*146*	*143*	*146*	*137*	*145*
Extraction Internal Standard 13C8 FOSA	%		*75.0*	*67.0*	*77.0*	*77.0*	*74.0*
Extraction Internal Standard d3 N MeFOSA	%		*94.0*	*106*	*101*	*104*	*104*
Extraction Internal Standard d5 N EtFOSA	%		*98.0*	*106*	*98.0*	*104*	*101*
Extraction Internal Standard d7 N MeFOSE	%		*102*	*104*	*101*	*104*	*102*
Extraction Internal Standard d9 N EtFOSE	%		*102*	*107*	*105*	*107*	*104*
Extraction Internal Standard d3 N MeFOSAA	%		*115*	*65.0*	*128*	*102*	*106*
Extraction Internal Standard d5 N EtFOSAA	%		*121*	*104*	*115*	*126*	*117*

Envirolab ID	Units	PQL	PGD0893-06	PGD0893-07	PGD0893-08	PGD0893-09	PGD0893-10
Your Reference			MB1_a	MB1_b	MB2	MB3	MB4
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Perfluorobutanesulfonic acid (PFBS)	µg/L	0.00040	0.00085	0.00091	0.00075	0.00092	0.0032
Perfluoropentanesulfonic acid (PFPeS)	µg/L	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0021
Perfluorohexanesulfonic acid (PFHxS)	µg/L	0.00020	0.0042	0.0042	0.0078	0.0038	0.035
Perfluoroheptanesulfonic acid (PFHpS)	µg/L	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0014
Perfluorooctanesulfonic acid (PFOS)	µg/L	0.00020	0.018	0.016	0.015	0.013	0.027
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluorobutanoic acid (PFBA)	µg/L	0.0020	<0.010	<0.010	<0.010	<0.010	<0.010
Perfluoropentanoic acid (PFPeA)	µg/L	0.0020	0.0045	0.0042	0.0034	0.0036	0.0040
Perfluorohexanoic acid (PFHxA)	µg/L	0.00040	0.0037	0.0041	0.0027	0.0032	0.0030
Perfluoroheptanoic acid (PFHpA)	µg/L	0.00040	0.0040	0.0038	0.0021	0.0022	0.0061
Perfluorooctanoic acid (PFOA)	µg/L	0.00020	0.0038	0.0039	0.0025	0.0026	0.016
Perfluorononanoic acid (PFNA)	µg/L	0.0010	0.0012	0.0011	<0.0010	<0.0010	0.0018
Perfluorodecanoic acid (PFDA)	µg/L	0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluorododecanoic acid (PFDoDA)	µg/L	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.050	<0.050	<0.050	<0.050	<0.050	<0.050
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00060
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluorooctane sulfonamide (FOSA)	µg/L	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.050	<0.050	<0.050	<0.050	<0.050	<0.050
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-Methyl perfluorooctane sulfonamidoethanol	µg/L	0.050	<0.050	<0.050	<0.050	<0.050	<0.050
N-Ethyl perfluorooctane sulfonamidoethanol	µg/L	0.50	<0.50	<0.50	<0.50	<0.50	<0.50
N-Methyl perfluorooctane sulfonamidoacetic acid	µg/L	0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
N-Ethyl perfluorooctane sulfonamidoacetic acid	µg/L	0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020

NAGD Seawater Elutriate - PFAS Extended List - Trace Level (Soil) - Analysed By Envirolab Services Sydney

Envirolab ID	Units	PQL	PGD0893-06	PGD0893-07	PGD0893-08	PGD0893-09	PGD0893-10
Your Reference			MB1_a	MB1_b	MB2	MB3	MB4
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Surrogate 13C8 PFOS	%		*90.2*	*87.6*	*90.1*	*89.2*	*89.0*
Surrogate 13C2 PFOA	%		*107*	*111*	*105*	*101*	*98.2*
Extraction Internal Standard 13C3 PFBS	%		*66.0*	*69.0*	*68.0*	*68.0*	*66.0*
Extraction Internal Standard 18O2 PFHxS	%		*76.0*	*77.0*	*79.0*	*81.0*	*84.0*
Extraction Internal Standard 13C4 PFOS	%		*71.0*	*72.0*	*77.0*	*72.0*	*76.0*
Extraction Internal Standard 13C4 PFBA	%		*27.0 [9]*	*26.0 [9]*	*26.0 [9]*	*24.0 [9]*	*30.0 [9]*
Extraction Internal Standard 13C3 PFPeA	%		*54.0*	*59.0*	*56.0*	*58.0*	*58.0*
Extraction Internal Standard 13C2 PFHxA	%		*84.0*	*86.0*	*87.0*	*86.0*	*91.0*
Extraction Internal Standard 13C4 PFHpA	%		*92.0*	*90.0*	*94.0*	*98.0*	*103*
Extraction Internal Standard 13C4 PFOA	%		*94.0*	*90.0*	*96.0*	*92.0*	*99.0*
Extraction Internal Standard 13C5 PFNA	%		*91.0*	*98.0*	*103*	*99.0*	*97.0*
Extraction Internal Standard 13C2 PFDA	%		*102*	*107*	*112*	*102*	*102*
Extraction Internal Standard 13C2 PFUnDA	%		*115*	*102*	*137*	*113*	*112*
Extraction Internal Standard 13C2 PFDoDA	%		*85.0*	*84.0*	*75.0*	*69.0*	*70.0*
Extraction Internal Standard 13C2 PFTeDA	%		*84.0*	*82.0*	*67.0*	*60.0*	*76.0*
Extraction Internal Standard 13C2 4:2FTS	%		*131*	*117*	*149*	*129*	*145*
Extraction Internal Standard 13C2 6:2FTS	%		*126*	*122*	*143*	*137*	*144*
Extraction Internal Standard 13C2 8:2FTS	%		*156 [9]*	*146*	*159 [9]*	*162 [9]*	*163 [9]*
Extraction Internal Standard 13C8 FOSA	%		*76.0*	*67.0*	*81.0*	*78.0*	*63.0*
Extraction Internal Standard d3 N MeFOSA	%		*100*	*109*	*104*	*107*	*99.0*
Extraction Internal Standard d5 N EtFOSA	%		*100*	*104*	*102*	*104*	*104*
Extraction Internal Standard d7 N MeFOSE	%		*101*	*103*	*107*	*109*	*104*
Extraction Internal Standard d9 N EtFOSE	%		*103*	*109*	*107*	*105*	*106*
Extraction Internal Standard d3 N MeFOSAA	%		*98.0*	*62.0*	*125*	*110*	*49.0 [9]*
Extraction Internal Standard d5 N EtFOSAA	%		*108*	*118*	*134*	*126*	*116*

Envirolab ID	Units	PQL	PGD0893-11	PGD0893-12	PGD0893-13	PGD0893-14	PGD0893-15
Your Reference			MB5	MB6	AP1	AP2	AP3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Perfluorobutanesulfonic acid (PFBS)	µg/L	0.00040	0.0011	0.0023	0.00089	0.00073	0.0018
Perfluoropentanesulfonic acid (PFPeS)	µg/L	0.0010	<0.0010	0.0018	<0.0010	<0.0010	0.0011
Perfluorohexanesulfonic acid (PFHxS)	µg/L	0.00020	0.0042	0.040	0.0050	0.0036	0.017
Perfluoroheptanesulfonic acid (PFHpS)	µg/L	0.0010	<0.0010	0.0015	<0.0010	<0.0010	<0.0010
Perfluorooctanesulfonic acid (PFOS)	µg/L	0.00020	0.015	0.030	0.044	0.0089	0.017
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluorobutanoic acid (PFBA)	µg/L	0.0020	<0.010	<0.010	<0.010	<0.010	<0.010
Perfluoropentanoic acid (PFPeA)	µg/L	0.0020	0.0037	0.0041	0.0068	0.0036	0.0036
Perfluorohexanoic acid (PFHxA)	µg/L	0.00040	0.0030	0.0033	0.0073	0.0027	0.0026
Perfluoroheptanoic acid (PFHpA)	µg/L	0.00040	0.0023	0.0048	0.0080	0.0021	0.0048
Perfluorooctanoic acid (PFOA)	µg/L	0.00020	0.0032	0.020	0.017	0.0027	0.012
Perfluorononanoic acid (PFNA)	µg/L	0.0010	<0.0010	0.0017	0.0045	<0.0010	0.0010
Perfluorodecanoic acid (PFDA)	µg/L	0.0020	<0.0020	<0.0020	0.0028	<0.0020	<0.0020
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluorododecanoic acid (PFDoDA)	µg/L	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.010	<0.010	<0.010	<0.010	<0.010	<0.010

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Envirolab ID	Units	PQL	PGD0893-11	PGD0893-12	PGD0893-13	PGD0893-14	PGD0893-15
Your Reference			MB5	MB6	AP1	AP2	AP3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.050	<0.050	<0.050	<0.050	<0.050	<0.050
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.00040	<0.00040	0.00049	<0.00040	<0.00040	<0.00040
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluorooctane sulfonamide (FOSA)	µg/L	0.010	<0.010	<0.010	<0.010	<0.010	<0.020
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.050	<0.050	<0.050	<0.050	<0.050	<0.050
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-Methyl perfluorooctane sulfonamidoethanol	µg/L	0.050	<0.050	<0.050	<0.050	<0.050	<0.050
N-Ethyl perfluorooctane sulfonamidoethanol	µg/L	0.50	<0.50	<0.50	<0.50	<0.50	<0.50
N-Methyl perfluorooctane sulfonamidoacetic acid	µg/L	0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
N-Ethyl perfluorooctane sulfonamidoacetic acid	µg/L	0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Surrogate 13C8 PFOS	%		*91.2*	*92.2*	*90.2*	*92.3*	*90.1*
Surrogate 13C2 PFOA	%		*110*	*105*	*107*	*117*	*116*
Extraction Internal Standard 13C3 PFBS	%		*71.0*	*73.0*	*76.0*	*72.0*	*63.0*
Extraction Internal Standard 18O2 PFHxS	%		*81.0*	*85.0*	*80.0*	*83.0*	*79.0*
Extraction Internal Standard 13C4 PFOS	%		*63.0*	*67.0*	*66.0*	*66.0*	*60.0*
Extraction Internal Standard 13C4 PFBA	%		*27.0 [9]*	*31.0 [9]*	*33.0 [9]*	*31.0 [9]*	*29.0 [9]*
Extraction Internal Standard 13C3 PFPeA	%		*60.0*	*60.0*	*61.0*	*62.0*	*60.0*
Extraction Internal Standard 13C2 PFHxA	%		*92.0*	*86.0*	*86.0*	*90.0*	*90.0*
Extraction Internal Standard 13C4 PFHpA	%		*95.0*	*105*	*102*	*104*	*98.0*
Extraction Internal Standard 13C4 PFOA	%		*84.0*	*82.0*	*82.0*	*82.0*	*81.0*
Extraction Internal Standard 13C5 PFNA	%		*91.0*	*96.0*	*93.0*	*97.0*	*84.0*
Extraction Internal Standard 13C2 PFDA	%		*89.0*	*94.0*	*107*	*101*	*97.0*
Extraction Internal Standard 13C2 PFUnDA	%		*107*	*101*	*103*	*102*	*91.0*
Extraction Internal Standard 13C2 PFDoDA	%		*72.0*	*55.0*	*65.0*	*73.0*	*56.0*
Extraction Internal Standard 13C2 PFTeDA	%		*77.0*	*67.0*	*75.0*	*85.0*	*75.0*
Extraction Internal Standard 13C2 4:2FTS	%		*133*	*128*	*131*	*132*	*149*
Extraction Internal Standard 13C2 6:2FTS	%		*132*	*137*	*124*	*133*	*136*
Extraction Internal Standard 13C2 8:2FTS	%		*145*	*139*	*129*	*148*	*138*
Extraction Internal Standard 13C8 FOSA	%		*67.0*	*54.0*	*73.0*	*73.0*	*35.0 [9]*
Extraction Internal Standard d3 N MeFOSA	%		*98.0*	*96.0*	*100*	*99.0*	*105*
Extraction Internal Standard d5 N EtFOSA	%		*101*	*96.0*	*97.0*	*99.0*	*97.0*
Extraction Internal Standard d7 N MeFOSE	%		*108*	*103*	*107*	*109*	*104*
Extraction Internal Standard d9 N EtFOSE	%		*107*	*105*	*102*	*103*	*101*
Extraction Internal Standard d3 N MeFOSAA	%		*76.0*	*35.0 [9]*	*90.0*	*108*	*35.0 [9]*
Extraction Internal Standard d5 N EtFOSAA	%		*109*	*81.0*	*94.0*	*113*	*76.0*

Envirolab ID	Units	PQL	PGD0893-16	PGD0893-17	PGD0893-18	PGD0893-19	PGD0893-20
Your Reference			CB1_1	CB1_2	CB1_3	CB2	CB3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Perfluorobutanesulfonic acid (PFBS)	µg/L	0.00040	0.0019	0.0018	0.0016	0.0022	0.0018
Perfluoropentanesulfonic acid (PFPeS)	µg/L	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

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Envirolab ID	Units	PQL	PGD0893-16	PGD0893-17	PGD0893-18	PGD0893-19	PGD0893-20
Your Reference			CB1_1	CB1_2	CB1_3	CB2	CB3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Perfluorohexanesulfonic acid (PFHxS)	µg/L	0.00020	0.0042	0.0040	0.0043	0.0046	0.0036
Perfluoroheptanesulfonic acid (PFHpS)	µg/L	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Perfluorooctanesulfonic acid (PFOS)	µg/L	0.00020	0.0099	0.013	0.011	0.013	0.011
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluorobutanoic acid (PFBA)	µg/L	0.0020	<0.010	<0.010	<0.010	<0.020	<0.010
Perfluoropentanoic acid (PFPeA)	µg/L	0.0020	0.0026	0.0026	0.0026	<0.0040	0.0027
Perfluorohexanoic acid (PFHxA)	µg/L	0.00040	0.0028	0.0029	0.0031	0.0030	0.0029
Perfluoroheptanoic acid (PFHpA)	µg/L	0.00040	0.0023	0.0023	0.0023	0.0025	0.0022
Perfluorooctanoic acid (PFOA)	µg/L	0.00020	0.0026	0.0027	0.0026	0.0030	0.0022
Perfluorononanoic acid (PFNA)	µg/L	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Perfluorodecanoic acid (PFDA)	µg/L	0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluorododecanoic acid (PFDoDA)	µg/L	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.050	<0.050	<0.050	<0.050	<0.050	<0.050
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluorooctane sulfonamide (FOSA)	µg/L	0.010	<0.010	<0.020	<0.020	<0.020	<0.010
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.050	<0.050	<0.050	<0.050	<0.050	<0.050
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-Methyl perfluorooctane sulfonamidoethanol	µg/L	0.050	<0.050	<0.050	<0.050	<0.050	<0.050
N-Ethyl perfluorooctane sulfonamidoethanol	µg/L	0.50	<0.50	<0.50	<0.50	<0.50	<0.50
N-Methyl perfluorooctane sulfonamidoacetic acid	µg/L	0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
N-Ethyl perfluorooctane sulfonamidoacetic acid	µg/L	0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Surrogate 13C8 PFOS	%		*101*	*110*	*108*	*109*	*113*
Surrogate 13C2 PFOA	%		*101*	*102*	*103*	*104*	*104*
Extraction Internal Standard 13C3 PFBS	%		*54.0*	*54.0*	*63.0*	*51.0*	*56.0*
Extraction Internal Standard 18O2 PFHxS	%		*110*	*112*	*115*	*104*	*116*
Extraction Internal Standard 13C4 PFOS	%		*89.0*	*81.0*	*90.0*	*80.0*	*83.0*
Extraction Internal Standard 13C4 PFBA	%		*25.0 [9]*	*23.0 [9]*	*21.0 [9]*	*## [9]*	*27.0 [9]*
Extraction Internal Standard 13C3 PFPeA	%		*51.0*	*50.0*	*51.0*	*46.0 [9]*	*51.0*
Extraction Internal Standard 13C2 PFHxA	%		*67.0*	*66.0*	*68.0*	*62.0*	*68.0*
Extraction Internal Standard 13C4 PFHpA	%		*76.0*	*77.0*	*79.0*	*72.0*	*79.0*
Extraction Internal Standard 13C4 PFOA	%		*99.0*	*97.0*	*104*	*95.0*	*104*
Extraction Internal Standard 13C5 PFNA	%		*109*	*108*	*111*	*106*	*115*
Extraction Internal Standard 13C2 PFDA	%		*114*	*112*	*113*	*107*	*116*
Extraction Internal Standard 13C2 PFUnDA	%		*114*	*108*	*114*	*106*	*120*
Extraction Internal Standard 13C2 PFDoDA	%		*112*	*107*	*114*	*110*	*117*
Extraction Internal Standard 13C2 PFTeDA	%		*116*	*120*	*118*	*118*	*129*
Extraction Internal Standard 13C2 4:2FTS	%		*113*	*105*	*108*	*106*	*115*

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Envirolab ID	Units	PQL	PGD0893-16	PGD0893-17	PGD0893-18	PGD0893-19	PGD0893-20
Your Reference			CB1_1	CB1_2	CB1_3	CB2	CB3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Extraction Internal Standard 13C2 6:2FTS	%		*155 [9]*	*159 [9]*	*167 [9]*	*147*	*163 [9]*
Extraction Internal Standard 13C2 8:2FTS	%		*193 [9]*	*167 [9]*	*176 [9]*	*153 [9]*	*190 [9]*
Extraction Internal Standard 13C8 FOSA	%		*60.0*	*45.0 [9]*	*49.0 [9]*	*39.0 [9]*	*55.0*
Extraction Internal Standard d3 N MeFOSA	%		*101*	*100*	*100*	*102*	*100*
Extraction Internal Standard d5 N EtFOSA	%		*96.0*	*96.0*	*101*	*99.0*	*100*
Extraction Internal Standard d7 N MeFOSE	%		*106*	*109*	*108*	*106*	*106*
Extraction Internal Standard d9 N EtFOSE	%		*101*	*103*	*106*	*101*	*107*
Extraction Internal Standard d3 N MeFOSAA	%		*128*	*97.0*	*114*	*91.0*	*122*
Extraction Internal Standard d5 N EtFOSAA	%		*166 [9]*	*136*	*160 [9]*	*141*	*163 [9]*

Chromium Reducible Sulfur Suite (Soil)

Envirolab ID	Units	PQL	PGD0893-01	PGD0893-02	PGD0893-03	PGD0893-04	PGD0893-05
Your Reference			EQ1	EQ2_1	EQ2_2	EQ3_3	EQ3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
pH KCl	pH units		8.4	9.1	9.1	9.2	8.9
TAA	moles H+/t	5.0	<5.0	<5.0	<5.0	<5.0	<5.0
s-TAA	% w/w S	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Chromium Reducible Sulfur	% w/w	0.0050	0.40	0.12	0.097	0.084	0.14
a-Chromium Reducible Sulfur	moles H+/t	3.0	250	77	60	53	85
SHCl	% w/w S	0.0050	NT	NT	NT	NT	NT
SKCl	% w/w S	0.0050	NT	NT	NT	NT	NT
SNAS	% w/w S	0.0050	NT	NT	NT	NT	NT
a-SNAS	moles H+/t	5.0	NT	NT	NT	NT	NT
s-SNAS	% w/w S	0.010	NT	NT	NT	NT	NT
Fineness Factor	-	1.5	1.5	1.5	1.5	1.5	1.5
ANCBT	% CaCO3	0.010	14	23	22	27	15
a-ANCBT	moles H+/t	5.0	2800	4500	4500	5500	3000
s-ANCBT	% w/w S	0.010	4.4	7.2	7.2	8.7	4.8
s-Net Acidity	% w/w S	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
a-Net Acidity	moles H+/t	5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Liming rate	kg CaCO3/t	0.75	<0.75	<0.75	<0.75	<0.75	<0.75
s-Net Acidity without ANCE	% w/w S	0.0050	0.40	0.12	0.097	0.084	0.14
a-Net Acidity without ANCE	moles H+/t	5.0	250	77	60	53	85
Liming rate without ANCE	kg CaCO3/t	0.75	19	5.8	4.5	3.9	6.4

Envirolab ID	Units	PQL	PGD0893-06	PGD0893-07	PGD0893-08	PGD0893-09	PGD0893-10
Your Reference			MB1_a	MB1_b	MB2	MB3	MB4
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
pH KCl	pH units		9.3	9.2	8.0	8.2	9.5
TAA	moles H+/t	5.0	<5.0	<5.0	<5.0	<5.0	<5.0
s-TAA	% w/w S	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Chromium Reducible Sulfur	% w/w	0.0050	0.026	0.052	1.4	0.53	0.027
a-Chromium Reducible Sulfur	moles H+/t	3.0	16	33	850	330	17
SHCl	% w/w S	0.0050	NT	NT	NT	NT	NT
SKCl	% w/w S	0.0050	NT	NT	NT	NT	NT
SNAS	% w/w S	0.0050	NT	NT	NT	NT	NT
a-SNAS	moles H+/t	5.0	NT	NT	NT	NT	NT
s-SNAS	% w/w S	0.010	NT	NT	NT	NT	NT
Fineness Factor	-	1.5	1.5	1.5	1.5	1.5	1.5
ANCBT	% CaCO3	0.010	0.72	2.4	8.6	7.4	3.2
a-ANCBT	moles H+/t	5.0	140	480	1700	1500	640
s-ANCBT	% w/w S	0.010	0.23	0.77	2.8	2.4	1.0
s-Net Acidity	% w/w S	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
a-Net Acidity	moles H+/t	5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Liming rate	kg CaCO3/t	0.75	<0.75	<0.75	<0.75	<0.75	<0.75
s-Net Acidity without ANCE	% w/w S	0.0050	0.026	0.052	1.4	0.53	0.027
a-Net Acidity without ANCE	moles H+/t	5.0	16	33	850	330	17
Liming rate without ANCE	kg CaCO3/t	0.75	1.2	2.4	64	25	1.3

Chromium Reducible Sulfur Suite (Soil)

Envirolab ID	Units	PQL	PGD0893-11	PGD0893-12	PGD0893-13	PGD0893-14	PGD0893-15
Your Reference			MB5	MB6	AP1	AP2	AP3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
pH KCl	pH units		8.2	9.3	9.5	8.4	9.4
TAA	moles H+/t	5.0	<5.0	<5.0	<5.0	<5.0	<5.0
s-TAA	% w/w S	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Chromium Reducible Sulfur	% w/w	0.0050	0.57	0.049	0.022	1.0	0.060
a-Chromium Reducible Sulfur	moles H+/t	3.0	350	30	14	650	37
SHCl	% w/w S	0.0050	NT	NT	NT	NT	NT
SKCl	% w/w S	0.0050	NT	NT	NT	NT	NT
SNAS	% w/w S	0.0050	NT	NT	NT	NT	NT
a-SNAS	moles H+/t	5.0	NT	NT	NT	NT	NT
s-SNAS	% w/w S	0.010	NT	NT	NT	NT	NT
Fineness Factor	-	1.5	1.5	1.5	1.5	1.5	1.5
ANCBT	% CaCO3	0.010	2.8	1.7	2.7	21	3.5
a-ANCBT	moles H+/t	5.0	560	340	540	4200	700
s-ANCBT	% w/w S	0.010	0.90	0.55	0.86	6.7	1.1
s-Net Acidity	% w/w S	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
a-Net Acidity	moles H+/t	5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Liming rate	kg CaCO3/t	0.75	<0.75	<0.75	<0.75	<0.75	<0.75
s-Net Acidity without ANCE	% w/w S	0.0050	0.57	0.049	0.022	1.0	0.060
a-Net Acidity without ANCE	moles H+/t	5.0	350	30	14	650	37
Liming rate without ANCE	kg CaCO3/t	0.75	26	2.3	1.0	49	2.8

Envirolab ID	Units	PQL	PGD0893-16	PGD0893-17	PGD0893-18	PGD0893-19	PGD0893-20
Your Reference			CB1_1	CB1_2	CB1_3	CB2	CB3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
pH KCl	pH units		8.6	8.6	8.6	8.4	9.0
TAA	moles H+/t	5.0	<5.0	<5.0	<5.0	<5.0	<5.0
s-TAA	% w/w S	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Chromium Reducible Sulfur	% w/w	0.0050	0.57	0.56	0.65	0.70	0.33
a-Chromium Reducible Sulfur	moles H+/t	3.0	360	350	410	430	200
SHCl	% w/w S	0.0050	NT	NT	NT	NT	NT
SKCl	% w/w S	0.0050	NT	NT	NT	NT	NT
SNAS	% w/w S	0.0050	NT	NT	NT	NT	NT
a-SNAS	moles H+/t	5.0	NT	NT	NT	NT	NT
s-SNAS	% w/w S	0.010	NT	NT	NT	NT	NT
Fineness Factor	-	1.5	1.5	1.5	1.5	1.5	1.5
ANCBT	% CaCO3	0.010	19	23	23	16	24
a-ANCBT	moles H+/t	5.0	3800	4500	4500	3300	4900
s-ANCBT	% w/w S	0.010	6.0	7.3	7.2	5.2	7.8
s-Net Acidity	% w/w S	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
a-Net Acidity	moles H+/t	5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Liming rate	kg CaCO3/t	0.75	<0.75	<0.75	<0.75	<0.75	<0.75
s-Net Acidity without ANCE	% w/w S	0.0050	0.57	0.56	0.65	0.70	0.33
a-Net Acidity without ANCE	moles H+/t	5.0	360	350	410	430	200
Liming rate without ANCE	kg CaCO3/t	0.75	27	26	30	33	15

NAGD Elutriate Organometallics - SW (Soil)

Envirolab ID	Units	PQL	PGD0893-01	PGD0893-02	PGD0893-03	PGD0893-04	PGD0893-05
Your Reference			EQ1	EQ2_1	EQ2_2	EQ3_3	EQ3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Monobutyltin as Sn	µg/L	0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Dibutyltin as Sn	µg/L	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Tributyltin as Sn	µg/L	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Surrogate Triphenyltin	%		*101*	*101*	*99.2*	*102*	*101*

Envirolab ID	Units	PQL	PGD0893-06	PGD0893-07	PGD0893-08	PGD0893-09	PGD0893-10
Your Reference			MB1_a	MB1_b	MB2	MB3	MB4
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Monobutyltin as Sn	µg/L	0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Dibutyltin as Sn	µg/L	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Tributyltin as Sn	µg/L	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Surrogate Triphenyltin	%		*99.6*	*102*	*99.0*	*102*	*102*

Envirolab ID	Units	PQL	PGD0893-11	PGD0893-12	PGD0893-13	PGD0893-14	PGD0893-15
Your Reference			MB5	MB6	AP1	AP2	AP3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Monobutyltin as Sn	µg/L	0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Dibutyltin as Sn	µg/L	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Tributyltin as Sn	µg/L	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Surrogate Triphenyltin	%		*101*	*100*	*99.9*	*100*	*100*

Envirolab ID	Units	PQL	PGD0893-16	PGD0893-17	PGD0893-18	PGD0893-19	PGD0893-20
Your Reference			CB1_1	CB1_2	CB1_3	CB2	CB3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Monobutyltin as Sn	µg/L	0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Dibutyltin as Sn	µg/L	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Tributyltin as Sn	µg/L	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Surrogate Triphenyltin	%		*101*	*101*	*100*	*102*	*103*

Subcontracted Organics - Certificate: ACS2542237 - Analysed By ACS Laboratories (Australia) Pty Ltd (Soil)

Envirolab ID	Units	PQL	PGD0893-01	PGD0893-05	PGD0893-06	PGD0893-07	PGD0893-09
Your Reference			EQ1	EQ3	MB1_a	MB1_b	MB3
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Dichlofluanid*	mg/kg	0.020	<0.05 [17]	<0.05 [17]	<0.05 [17]	<0.05 [17]	<0.05 [17]

Envirolab ID	Units	PQL	PGD0893-10	PGD0893-12	PGD0893-13	PGD0893-15	PGD0893-19
Your Reference			MB4	MB6	AP1	AP3	CB2
Date Sampled			10/04/2025	10/04/2025	10/04/2025	10/04/2025	10/04/2025
Dichlofluanid*	mg/kg	0.020	<0.05 [17]	<0.05 [17]	<0.05 [17]	<0.05 [17]	<0.05 [17]

Envirolab ID	Units	PQL	PGD0893-20
Your Reference			CB3
Date Sampled			10/04/2025
Dichlofluanid*	mg/kg	0.020	<0.05 [17]

Asbestos ID in Soil

Client ID	Envirolab ID	Description	Result
EQ1	PGD0893-01	280g Soil/Debris	**No Asbestos Detected >0.1g/kg** **No trace fibres detected** Organic fibres detected ACM >7mm Est. <0.01% w/w* FA and AF Est. <0.001% w/w*
EQ2_1	PGD0893-02	415g Soil/Debris	**No Asbestos Detected >0.1g/kg** **No trace fibres detected** Organic fibres detected ACM >7mm Est. <0.01% w/w* FA and AF Est. <0.001% w/w*
EQ2_2	PGD0893-03	445g Soil/Debris	**No Asbestos Detected >0.1g/kg** **No trace fibres detected** Organic fibres detected ACM >7mm Est. <0.01% w/w* FA and AF Est. <0.001% w/w*
EQ3_3	PGD0893-04	250g Soil/Debris	**No Asbestos Detected >0.1g/kg** **No trace fibres detected** Organic fibres detected ACM >7mm Est. <0.01% w/w* FA and AF Est. <0.001% w/w*
EQ3	PGD0893-05	390g Soil/Debris	**No Asbestos Detected >0.1g/kg** **No trace fibres detected** Organic fibres detected ACM >7mm Est. <0.01% w/w* FA and AF Est. <0.001% w/w*
MB1_a	PGD0893-06	510g Soil/Debris	**No Asbestos Detected >0.1g/kg** **No trace fibres detected** Organic fibres detected ACM >7mm Est. <0.01% w/w* FA and AF Est. <0.001% w/w*
MB1_b	PGD0893-07	425g Soil/Debris	**No Asbestos Detected >0.1g/kg** **No trace fibres detected** Organic fibres detected ACM >7mm Est. <0.01% w/w* FA and AF Est. <0.001% w/w*
MB2	PGD0893-08	90g Soil/Debris	**No Asbestos Detected >0.1g/kg** **No trace fibres detected** Organic fibres detected ACM >7mm Est. <0.01% w/w* FA and AF Est. <0.001% w/w*
MB3	PGD0893-09	95g Soil/Debris	**No Asbestos Detected >0.1g/kg** **No trace fibres detected** Organic fibres detected ACM >7mm Est. <0.01% w/w* FA and AF Est. <0.001% w/w*
MB4	PGD0893-10	320g Soil/Debris	**No Asbestos Detected >0.1g/kg** **No trace fibres detected** Organic fibres detected ACM >7mm Est. <0.01% w/w* FA and AF Est. <0.001% w/w*

Asbestos ID in Soil

Client ID	Envirolab ID	Description	Result
MB5	PGD0893-11	110g Soil/Debris	**No Asbestos Detected >0.1g/kg** **No trace fibres detected** Organic fibres detected ACM >7mm Est. <0.01% w/w* FA and AF Est. <0.001% w/w*
MB6	PGD0893-12	250g Soil/Debris	**No Asbestos Detected >0.1g/kg** **No trace fibres detected** Organic fibres detected ACM >7mm Est. <0.01% w/w* FA and AF Est. <0.001% w/w*
AP1	PGD0893-13	510g Soil/Debris	**No Asbestos Detected >0.1g/kg** **No trace fibres detected** Organic fibres detected ACM >7mm Est. <0.01% w/w* FA and AF Est. <0.001% w/w*
AP2	PGD0893-14	120g Soil/Debris	**No Asbestos Detected >0.1g/kg** **No trace fibres detected** Organic fibres detected ACM >7mm Est. <0.01% w/w* FA and AF Est. <0.001% w/w*
AP3	PGD0893-15	290g Soil/Debris	**No Asbestos Detected >0.1g/kg** **No trace fibres detected** Organic fibres detected ACM >7mm Est. <0.01% w/w* FA and AF Est. <0.001% w/w*
CB1_1	PGD0893-16	195g Soil/Debris	**No Asbestos Detected >0.1g/kg** **No trace fibres detected** Organic fibres detected ACM >7mm Est. <0.01% w/w* FA and AF Est. <0.001% w/w*
CB1_2	PGD0893-17	130g Soil/Debris	**No Asbestos Detected >0.1g/kg** **No trace fibres detected** Organic fibres detected ACM >7mm Est. <0.01% w/w* FA and AF Est. <0.001% w/w*
CB1_3	PGD0893-18	190g Soil/Debris	**No Asbestos Detected >0.1g/kg** **No trace fibres detected** Organic fibres detected ACM >7mm Est. <0.01% w/w* FA and AF Est. <0.001% w/w*
CB2	PGD0893-19	225g Soil/Debris	**No Asbestos Detected >0.1g/kg** **No trace fibres detected** Organic fibres detected ACM >7mm Est. <0.01% w/w* FA and AF Est. <0.001% w/w*
CB3	PGD0893-20	360g Soil/Debris	**No Asbestos Detected >0.1g/kg** **No trace fibres detected** Organic fibres detected ACM >7mm Est. <0.01% w/w* FA and AF Est. <0.001% w/w*

Result Comments

Identifier	Description
[1]	Matrix interference - sample contained elevated chloride levels.
[7]	Surrogate recovery was outside routine acceptance criteria (60-140%) due to sample matrix effects. This may be due to the presence of carbon and/or other artefacts. An acceptable recovery was achieved for the LCS surrogates.
[8]	DDT can break down to DDD and DDE during analysis due to sample matrix. The DDT breakdown exceeded the recommended breakdown criteria of 20% after running the samples, therefore levels of DDE, DDD, DDT may be slightly elevated or underestimated.
[9]	For PFAS Extracted Internal Standards denoted with ## or being outside the 50-150% acceptance range, the respective target analyte results may be unaffected, in other circumstances the PQL has been raised to accommodate the outlier(s).
[10]	PQL(s) has/have been raised due to the high moisture content in the sample, resulting in a higher effective dilution factor.
[11]	PQL(s) has/have been raised due to suppression of the internal standard, which required the sample(s) to be diluted. This is likely due to the high level of salts in the sample.
[12]	PQL(s) has/have been raised due to matrix interference.
[13]	PQL has been raised due to matrix requiring dilution
[17]	The sub-contracting laboratory did not provide analysis and/or preparation and/or sample receipt dates. The date(s) the sample(s) was/were received at the sub-contracting laboratory has/have been used to assess holding time(s).

Method Summary

Method ID	Methodology Summary
ASB-001_NEPM	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. NOTE #1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF) NOTE #2 The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation = Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques. Visible asbestos is defined as asbestos detected below the reporting limit of 0.1g/kg as per AS4964-2004
Calc	Calculation
Calc - TKN	TKN determined by calculation (Total Nitrogen - NOx).
Calc - Trivalent Cr	Calculation
INORG-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
INORG-055	Nitrate/Nitrite/NOx/TKN - determined colourimetrically. Waters samples are filtered on receipt prior to analysis. Soils/solids are analysed following a water extraction.
INORG-055/062	Total Nitrogen - Calculation, sum of TKN and oxidised Nitrogen.
INORG-057	Ammonia - determined colourimetrically. Water samples are filtered on receipt prior to analysis. Soils and OHS media are analysed following a water extraction. Alternatively, Ammonia can be extracted from soil using 1M KCl.
INORG-057_CALC	Calculation of Ammonium as N. Assumes all Ammonia is present as Ammonium unless samplpe pH and temperature provided.
INORG-060	Phosphate - determined colourimetrically using APHA latest edition 4500 P E. Water samples are filtered on receipt prior to analysis. Soils are analysed from a water extract.
INORG-060_TP	Total Phosphorus - determined colourimetrically using APHA latest edition 4500-P J. Water samples are filtered on receipt prior to analysis. Soils are analysed from a water extract.
INORG-062	TKN - determined colourimetrically. Alternatively, TKN can be derived from calculation (Total N - NOx).
INORG-068	Determination of Chromium Suite analysis - a sample is analysed by traditional titration method as well as ICP-OES analysis. There is no documented official holding time, we have assigned an arbitrary 180 days to frozen samples.
INORG-079	Carbon forms (inorganic, organic, total) determined using a TOC/NDIR analyser via combustion. Dissolved aqueous\forms require filtering prior to determination.
INORG-118	Hexavalent Chromium by Ion Chromatographic separation and colourimetric determination. Waters samples are filtered prior to analysis. Solids are extracted with an alkaline buffered solution, for air sampling media the same alkali extraction can be used or alternatives from NIOSH/OSHA. For aqueous samples, Total Hexavalent Chromium includes the dissolved Hexavalent Chromium and any Hexavalent Chromium solubilised by the preservative i.e. Sodium Hydroxide from any particulate that may be present.
INORG-127	Total Nitrogen by high temperature catalytic combustion with chemiluminescence detection. Organic Carbon forms (inorganic, organic, total) determined using a TOC/NDIR analyser via combustion. Dissolved forms require filtering prior to determination.
INORG-129	Determination of Acid Volatile Sulfide (AVS) and Simultaneously Extractable Metals (SEM)/Bioavailable Metals in soil/sediment - determined colourimetrically and using ICP-OES/ICP-MS and cold vapour-AAS.
INORG-137	Determination of Total Nitrogen, Sulphur and Total Carbon in solids, rock, plant material and vegetation via combustion and NDIR.
METALS-020	Determination of various metals by ICP-OES. Where salts (oxides, chlorides etc.) are calculated from the element concentration stoichiometrically there is no guarantee that the salt form is completely soluble in the acids used in the preparation.
METALS-020_1MHCL	Determination of various metals by ICP-AES using 1M HCl extraction solution
METALS-021	Determination of Mercury by Cold Vapour AAS.
METALS-021_1MHCL	Determination of Mercury by Cold Vapour AAS using 1M HCl extraction solution.

Method Summary

Method ID	Methodology Summary
METALS-021_NEUT	Determination of Mercury by Cold Vapour AAS following leaching using ultra high purity water, i.e. reagent water = CLASS 1, 2 & 4 from AS 4439.3.
METALS-022	Determination of various metals by ICP-MS. Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements. Where salts (oxides, chlorides etc.) are calculated from the element concentration stoichiometrically there is no guarantee that the salt form is completely soluble in the acids used in the preparation.
METALS-022_NEUT	Determination of various metals by ICP-MS following leaching using ultra high purity water, i.e. reagent water = CLASS 1, 2 & 4 from AS 4439.3.
ORG-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
ORG-021/022/025_PCB	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD and/or GC-MS/GC-MSMS.
ORG-022	Determination of semi-volatile organic compounds (SVOCs) by GC-MS. Water samples are extracted by LLE and soils using DCM/Acetone/Methanol.
ORG-022_OC	Determination of semi-volatile organic compounds (SVOCs) by GC-MS. Water samples are extracted by LLE and soils using DCM/Acetone/Methanol.
ORG-022_PAH	Determination of semi-volatile organic compounds (SVOCs) by GC-MS. Water samples are extracted by LLE and solids using DCM/Acetone/Methanol. For PAHs:- Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. 1. 'TEQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'TEQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'TEQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, for Total +ve calculations, the PQL is reflective of the lowest individual PQL and therefore, for example, "Total +ve PAHs" is simply a sum of the positive individual PAHs.
ORG-022_W	Determination of semi-volatile organic compounds (SVOCs) by GC-MS. Water samples are extracted by LLE.
ORG-023_F1_TOT	Determination of volatile organic compounds (VOCs) by P&T-GC-MS. Water samples are analysed directly by purge and trap GC-MS. Solids are extracted with Methanol, diluted and analysed by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.
ORG-025	Determination of semi-volatile organic compounds (SVOCs) by GC-MS-MS. Water samples are extracted by LLE and soils/solids/biota using DCM/Acetone/Methanol.
ORG-025_TBT_S	Determination of Organometallic Compounds by derivatisation and analysis by GC-MS-MS.
ORG-025_TBT_TCLP	Determination of Organometallic Compounds in TCLP extracts of soils by derivatisation and analysis by GC-MS-MS.
ORG-025_TBT_W	Determination of Organometallic Compounds by derivatisation and analysis by GC-MS-MS.
ORG-029	Soil/solid and sorbent samples are extracted with basified Methanol. Waters and soil/sorbent extracts are directly injected and/or concentrated/extracted using SPE. TCLP/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3. Analysis is undertaken with LC-MSMS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.4 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.
SUB-044_GCMS	Subcontracted to ACS Laboratories (Australia)

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 volumes are typically provided by customers (often as flow rate(s) and sampling time(s) and/or simply volume(s) sampled or exposure times (determines 'volume' passive badges are exposed to)). Hence in such circumstances the volume measurement is inevitably not covered by Envirolab's NATA accreditation. An exception may occur where Envirolab Newcastle does the sampling where accreditation exists for certain types of sampling and hence volume determination(s). Note air volumes are often used to determine concentrations for dust and/or analyses on filters, sorbents and in impingers. For canister sampling, the air volume is covered by Envirolab's NATA accreditation.

Data Quality Assessment Summary PGD0893

Client Details

Client	BMT Commercial Australia Pty Ltd (WA)
Your Reference	PTA Ferry Expansion Sampling
Date Issued	28/05/2025

Recommended Holding Time Compliance

Recommended holding time exceedances exist - See detailed list below

Quality Control and QC Frequency

QC Type	Compliant	Details
Blank	Yes	No Outliers
LCS	No	LCS Outliers Exist - See detailed list below
Duplicates	No	Duplicate Outliers Exist - See detailed list below
Matrix Spike	No	Matrix Spike Outliers Exist - See detailed list below
Surrogates / Extracted Internal Standards	No	Surrogates / Extracted ISTD Outliers Exist - See detailed list below
QC Frequency	No	QC Frequency Outliers Exist - See detailed list below

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 PGD0893

Recommended Holding Time Compliance

Analysis	Sample Number(s)	Date Sampled	Date Extracted	Date Analysed	Compliant
vTRH&MBTEXN | Water	21	10/04/2025	15/04/2025	16/04/2025	Yes
vTRH/BTEX - NAGD | Soil	1-6	10/04/2025	22/04/2025	22/04/2025	Yes
	7-20, 22	10/04/2025	22/04/2025	23/04/2025	Yes
sTRH | Water	21	10/04/2025	16/04/2025	18/04/2025	Yes
sTRH - NAGD | Soil	2-7, 9-10	10/04/2025	22/04/2025	23/04/2025	Yes
	1, 8, 11-20, 22	10/04/2025	22/04/2025	24/04/2025	Yes
PAH | Water	21	10/04/2025	16/04/2025	18/04/2025	Yes
PAH NAGD | Soil	12-20	10/04/2025	22/04/2025	01/05/2025	Yes
	22	10/04/2025	22/04/2025	24/04/2025	Yes
	1-11	10/04/2025	22/04/2025	30/04/2025	Yes
Toxaphene | Soil	1-2	10/04/2025	22/04/2025	29/04/2025	Yes
	3-20	10/04/2025	22/04/2025	30/04/2025	Yes
OCP | Water	21	10/04/2025	16/04/2025	18/04/2025	Yes
Toxaphene | Water	21	10/04/2025	16/04/2025	16/04/2025	Yes
OCP ANZG | Soil	12-20	10/04/2025	22/04/2025	01/05/2025	No
	22	10/04/2025	22/04/2025	24/04/2025	No
	1-11	10/04/2025	22/04/2025	30/04/2025	No
PCB | Water	21	10/04/2025	16/04/2025	18/04/2025	Yes
PCB Congeners NAGD | Soil	20	10/04/2025	22/04/2025	01/05/2025	Yes
	1-19, 22	10/04/2025	22/04/2025	24/04/2025	Yes
Syn Pyrethroid NAGD | Soil	12-20	10/04/2025	22/04/2025	01/05/2025	Yes
	22	10/04/2025	22/04/2025	24/04/2025	Yes
	1-11	10/04/2025	22/04/2025	30/04/2025	Yes
Diuron and Fluometuron | Soil	1-20, 22	10/04/2025	16/04/2025	17/04/2025	Yes
Diuron and Fluometuron | Water	21	10/04/2025	16/04/2025	16/04/2025	Yes
Organotins | Soil	1-20, 22	10/04/2025	22/04/2025	24/04/2025	Yes
Organotins | Water	21, 23	10/04/2025	23/04/2025	24/04/2025	No
TBT | Water	23	10/04/2025	23/04/2025	24/04/2025	No
ADWG - SVOC | Soil	1-16	10/04/2025	22/04/2025	24/04/2025	Yes
	17-20, 22	10/04/2025	22/04/2025	26/04/2025	Yes
ADWG - SVOC | Water	21	10/04/2025	16/04/2025	19/04/2025	Yes
Metals | Soil	1-20, 22	10/04/2025	22/04/2025	23/04/2025	Yes
Total Phosphorus | Water	21	10/04/2025	16/04/2025	17/04/2025	Yes
	23	10/04/2025	16/04/2025	24/04/2025	Yes
Metals (LL) | Soil	1-20, 22	10/04/2025	22/04/2025	23/04/2025	Yes
	1-20, 22	10/04/2025	22/04/2025	24/04/2025	Yes
Total Metals (LL) | Water	21, 23	10/04/2025	16/04/2025	22/04/2025	Yes
Total Metals (LL)-Hg | Water	21, 23	10/04/2025	16/04/2025	22/04/2025	Yes
Dissolved Metals (LL) | Water	21, 23	10/04/2025	16/04/2025	23/04/2025	Yes
Elutriate Metals | Soil	1-20	10/04/2025	22/04/2025	25/04/2025	Yes

Data Quality Assessment Summary PGD0893

Recommended Holding Time Compliance

Analysis	Sample Number(s)	Date Sampled	Date Extracted	Date Analysed	Compliant
Metals - Bioavailable 1M HCl | Soil	1-6, 8-20	10/04/2025	23/05/2025	27/05/2025	No
AVS | Soil	1-20	10/04/2025	11/04/2025	29/04/2025	Yes
TOC by Combustion | Soil	1-6, 8-20, 22	10/04/2025	15/04/2025	28/04/2025	Yes
Total Organic Carbon | Water	21	10/04/2025	16/04/2025	17/04/2025	Yes
Cr3+ | Water	21, 23	10/04/2025	16/04/2025	23/04/2025	Yes
Cr6+ | Water	23	10/04/2025	16/04/2025	17/04/2025	Yes
	21	10/04/2025	16/04/2025	22/04/2025	Yes
Cr6+ - Total | Water	21	10/04/2025	16/04/2025	17/04/2025	Yes
Nitrogen - Ammonia | Water	21, 23	10/04/2025	16/04/2025	16/04/2025	Yes
Nitrogen - Nitrate | Water	21, 23	10/04/2025	16/04/2025	16/04/2025	Yes
Nitrogen - Nitrite | Water	21, 23	10/04/2025	16/04/2025	16/04/2025	No
Nitrogen - NOx | Water	21, 23	10/04/2025	16/04/2025	16/04/2025	No
Nitrogen - Total N | Water	21	10/04/2025	17/04/2025	22/04/2025	Yes
	23	10/04/2025	17/04/2025	24/04/2025	Yes
Phosphate as P | Water	21, 23	10/04/2025	16/04/2025	16/04/2025	No
TKN as N calc | Water	21, 23	10/04/2025	16/04/2025	30/04/2025	Yes
Cr3+ | Soil	1-16	10/04/2025	22/04/2025	23/04/2025	Yes
	17-20, 22	10/04/2025	22/04/2025	24/04/2025	Yes
Cr6+ | Soil	1-16	10/04/2025	22/04/2025	23/04/2025	Yes
	17-20, 22	10/04/2025	22/04/2025	24/04/2025	Yes
Moisture | Soil	1-20, 22	10/04/2025	22/04/2025	23/04/2025	Yes
Ammonia - Free (Unionised) | Soil	1-20	10/04/2025	29/04/2025	30/04/2025	Yes
Ammonia as N Elutriate (SW) | Soil	1-20	10/04/2025	24/04/2025	28/04/2025	Yes
Ammonium as N Elutriate (SW) | Soil	1-20	10/04/2025	29/04/2025	30/04/2025	Yes
Cr6 - Elutriate SW | Soil	1-20	10/04/2025	24/04/2025	28/04/2025	Yes
Nitrate as N Elutriate (SW) | Soil	1-20	10/04/2025	24/04/2025	28/04/2025	No
Nitrite as N Elutriate (DW) | Soil	1-20	10/04/2025	24/04/2025	28/04/2025	No
NOx Elutriate (SW) | Soil	1-20	10/04/2025	24/04/2025	28/04/2025	No
P - Elutriate (SW) LL | Soil	1-20	10/04/2025	24/04/2025	28/04/2025	Yes
Phosphate as P Elutriate (SW) | Soil	1-20	10/04/2025	24/04/2025	28/04/2025	No
TKN as N calc Elutriate (SW) | Soil	1-20	10/04/2025	29/04/2025	30/04/2025	No
Total Nitrogen Elutriate (SW) | Soil	1-15	10/04/2025	24/04/2025	24/04/2025	Yes
	16-20	10/04/2025	24/04/2025	25/04/2025	Yes
PFAS EXT-ISTD | Soil	1-20, 22	10/04/2025	23/04/2025	25/04/2025	Yes
PFAS-Extended | Soil	1-20, 22	10/04/2025	23/04/2025	25/04/2025	Yes
PFAS EXT-ISTD | Water	21	10/04/2025	24/04/2025	24/04/2025	Yes
	23	10/04/2025	24/04/2025	25/04/2025	Yes

Data Quality Assessment Summary PGD0893

Recommended Holding Time Compliance

Analysis	Sample Number(s)	Date Sampled	Date Extracted	Date Analysed	Compliant
PFAS-Extended | Water	21	10/04/2025	24/04/2025	24/04/2025	Yes
	23	10/04/2025	24/04/2025	25/04/2025	Yes
PFAS Ext - NAGD Elutriate (SW) | Soil	1-20	10/04/2025	30/04/2025	30/04/2025	Yes
PFAS Ext - ISTD NAGD Elutriate (SW) | Soil	1-20	10/04/2025	30/04/2025	30/04/2025	Yes
Asbestos ID - NEPM | Soil	1-20	10/04/2025	24/04/2025	24/04/2025	Yes
CRS Suite | Soil	1-20	10/04/2025	15/04/2025	15/04/2025	Yes
TBT - Elutriate (SW) | Soil	1-20	10/04/2025	22/04/2025	24/04/2025	Yes
Dichlofluanid | Soil	1, 5-7, 9-10, 12-13, 15, 19-20	10/04/2025	17/04/2025	28/04/2025	Yes

Outliers: Laboratory Control Samples

METALS-021_1MHCL|Dilute Acid Extractable Bioavailable Metals (1M HCl) (Soil)| Batch BGE4254

Sample ID	Analyte	% Limits	% Recovery
BGE4254-BS1	Mercury	70 - 130	41.2

ORG-020|Semi-volatile TRH (Water)| Batch BGD3221

Sample ID	Analyte	% Limits	% Recovery
BGD3221-BS1	o-Terphenyl	60 - 140	##[6]

Data Quality Assessment Summary PGD0893

Outliers: Duplicates

METALS-020_1MHCL|Dilute Acid Extractable Bioavailable Metals (1M HCl) (Soil)| Batch BGE4254

Sample ID	Duplicate ID	Analyte	% Limits	RPD
PGD0893-03	DUP1	Copper	40.00	44.8[15]

METALS-022|Acid Extractable Low Level Metals (Soil)| Batch BGD3775

Sample ID	Duplicate ID	Analyte	% Limits	RPD
BGD3775-DUP3#	DUP3	Aluminium	40.00	42.1[15]
BGD3775-DUP3#	DUP3	Vanadium	40.00	45.2[15]
BGD3775-DUP4#	DUP4	Arsenic	40.00	46.1[15]
BGD3775-DUP4#	DUP4	Barium	40.00	123[15]
BGD3775-DUP4#	DUP4	Iron	40.00	180[15]
BGD3775-DUP4#	DUP4	Manganese	40.00	83.8[15]
BGD3775-DUP4#	DUP4	Vanadium	40.00	62.0[15]
BGD3775-DUP4#	DUP4	Zinc	40.00	61.9[15]

METALS-022_NEUT|NAGD Elutriate Metals - SW (Soil)| Batch BGD3859

Sample ID	Duplicate ID	Analyte	% Limits	RPD
PGD0893-02	DUP1	Manganese	20.00	53.2[15]
PGD0893-02	DUP1	Molybdenum	20.00	27.2[15]
PGD0893-02	DUP2	Manganese	20.00	54.5[15]
PGD0893-02	DUP2	Molybdenum	20.00	30.1[15]
PGD0893-03	DUP4	Manganese	20.00	22.3[15]

Outliers: Matrix Spike

METALS-022|Acid Extractable Low Level Metals (Soil)| Batch BGD3775

Sample ID	Analyte	% Limits	% Recovery
PGD0893-18	Aluminium	70 - 130	##[2]
PGD0893-18	Iron	70 - 130	##[2]

METALS-022|Acid Extractable Low Level Metals (Soil)| Batch BGD3791

Sample ID	Analyte	% Limits	% Recovery
PGD0893-02	Aluminium	70 - 130	##[2]
PGD0893-02	Iron	70 - 130	##[2]

ORG-020|Semi-volatile TRH (Water)| Batch BGD3221

Sample ID	Analyte	% Limits	% Recovery
BGD3221-MS1#	o-Terphenyl	60 - 140	##[6]

ORG-020|Semi-volatile TRH - NAGD (Soil)| Batch BGD3783

Sample ID	Analyte	% Limits	% Recovery
PGD0893-02	TRH >C34-C40 (F4)	60 - 140	##[5]
PGD0893-02	TRH C29-C36	60 - 140	##[5]

ORG-022|ADWG - GCMS SVOCs (Soil)| Batch BGD3793

Sample ID	Analyte	% Limits	% Recovery
PGD0893-18	Chlorothalonil	60 - 140	##[4]

ORG-022|Synthetic Pyrethroids (Soil)| Batch BGD3785

Sample ID	Analyte	% Limits	% Recovery
PGD0893-02	Bifenthrin	60 - 140	##[4]
PGD0893-02	lamda-Cyhalothrin	60 - 140	##[4]
PGD0893-02	p-Terphenyl-D14	60 - 140	##[7]

ORG-022_PAH|Polycyclic Aromatic Hydrocarbons - NAGD (Soil)| Batch BGD3785

Sample ID	Analyte	% Limits	% Recovery
PGD0893-02	Chrysene	60 - 140	##[2]
PGD0893-02	Fluoranthene	60 - 140	##[2]
PGD0893-02	Naphthalene	60 - 140	##[4]

Data Quality Assessment Summary PGD0893

ORG-022_PAH | Polycyclic Aromatic Hydrocarbons - NAGD (Soil) | Batch BGD3785

Sample ID	Analyte	% Limits	% Recovery
PGD0893-02	p-Terphenyl-D14	60 - 140	##[7]
PGD0893-02	Pyrene	60 - 140	##[2]

ORG-025 | Organochlorine Pesticides - ANZG (Soil) | Batch BGD3785

Sample ID	Analyte	% Limits	% Recovery
PGD0893-02	4-chloro-3-nitrobenzotrifluoride	60 - 140	##[7]

ORG-025 | Polychlorinated Biphenyls - NAGD (Soil) | Batch BGD3785

Sample ID	Analyte	% Limits	% Recovery
PGD0893-02	2-Fluorobiphenyl	60 - 140	##[7]

Outliers: Surrogate / Extracted Internal Standards

ORG-022|Synthetic Pyrethroids (Matrix)| Batch BGD3785

Sample ID	Analyte	% Limits	% Recovery
PGD0893-03	p-Terphenyl-D14	60 - 140	## [7]
PGD0893-04	p-Terphenyl-D14	60 - 140	## [7]
PGD0893-05	p-Terphenyl-D14	60 - 140	## [7]
PGD0893-12	p-Terphenyl-D14	60 - 140	## [7]
PGD0893-13	p-Terphenyl-D14	60 - 140	## [7]
PGD0893-14	p-Terphenyl-D14	60 - 140	## [7]
PGD0893-15	p-Terphenyl-D14	60 - 140	## [7]
PGD0893-16	p-Terphenyl-D14	60 - 140	## [7]
PGD0893-18	p-Terphenyl-D14	60 - 140	## [7]

ORG-022_PAH|Polycyclic Aromatic Hydrocarbons - NAGD (Matrix)| Batch BGD3785

Sample ID	Analyte	% Limits	% Recovery
PGD0893-03	p-Terphenyl-D14	60 - 140	## [7]
PGD0893-04	p-Terphenyl-D14	60 - 140	## [7]
PGD0893-05	p-Terphenyl-D14	60 - 140	## [7]
PGD0893-12	p-Terphenyl-D14	60 - 140	## [7]
PGD0893-13	p-Terphenyl-D14	60 - 140	## [7]
PGD0893-14	p-Terphenyl-D14	60 - 140	## [7]
PGD0893-15	p-Terphenyl-D14	60 - 140	## [7]
PGD0893-16	p-Terphenyl-D14	60 - 140	## [7]
PGD0893-18	p-Terphenyl-D14	60 - 140	## [7]

ORG-025|Organochlorine Pesticides - ANZG (Matrix)| Batch BGD3785

Sample ID	Analyte	% Limits	% Recovery
PGD0893-01	4-chloro-3-nitrobenzotrifluoride	60 - 140	## [7]
PGD0893-02	4-chloro-3-nitrobenzotrifluoride	60 - 140	## [7]
PGD0893-03	4-chloro-3-nitrobenzotrifluoride	60 - 140	## [7]
PGD0893-04	4-chloro-3-nitrobenzotrifluoride	60 - 140	## [7]
PGD0893-05	4-chloro-3-nitrobenzotrifluoride	60 - 140	## [7]
PGD0893-06	4-chloro-3-nitrobenzotrifluoride	60 - 140	## [7]
PGD0893-07	4-chloro-3-nitrobenzotrifluoride	60 - 140	## [7]
PGD0893-08	4-chloro-3-nitrobenzotrifluoride	60 - 140	## [7]
PGD0893-09	4-chloro-3-nitrobenzotrifluoride	60 - 140	## [7]
PGD0893-10	4-chloro-3-nitrobenzotrifluoride	60 - 140	## [7]
PGD0893-11	4-chloro-3-nitrobenzotrifluoride	60 - 140	## [7]
PGD0893-12	4-chloro-3-nitrobenzotrifluoride	60 - 140	## [7]
PGD0893-13	4-chloro-3-nitrobenzotrifluoride	60 - 140	## [7]
PGD0893-14	4-chloro-3-nitrobenzotrifluoride	60 - 140	## [7]
PGD0893-15	4-chloro-3-nitrobenzotrifluoride	60 - 140	## [7]
PGD0893-16	4-chloro-3-nitrobenzotrifluoride	60 - 140	## [7]

Data Quality Assessment Summary PGD0893

ORG-025|Organochlorine Pesticides - ANZG (Matrix)| Batch BGD3785

Sample ID	Analyte	% Limits	% Recovery
PGD0893-17	4-chloro-3-nitrobenzotrifluoride	60 - 140	## [7]
PGD0893-18	4-chloro-3-nitrobenzotrifluoride	60 - 140	## [7]
PGD0893-19	4-chloro-3-nitrobenzotrifluoride	60 - 140	## [7]

ORG-025|Polychlorinated Biphenyls - NAGD (Matrix)| Batch BGD3785

Sample ID	Analyte	% Limits	% Recovery
PGD0893-01	2-Fluorobiphenyl	60 - 140	## [7]
PGD0893-02	2-Fluorobiphenyl	60 - 140	## [7]
PGD0893-03	2-Fluorobiphenyl	60 - 140	## [7]
PGD0893-04	2-Fluorobiphenyl	60 - 140	## [7]
PGD0893-05	2-Fluorobiphenyl	60 - 140	## [7]
PGD0893-06	2-Fluorobiphenyl	60 - 140	## [7]
PGD0893-07	2-Fluorobiphenyl	60 - 140	## [7]
PGD0893-08	2-Fluorobiphenyl	60 - 140	## [7]
PGD0893-09	2-Fluorobiphenyl	60 - 140	## [7]
PGD0893-10	2-Fluorobiphenyl	60 - 140	## [7]
PGD0893-11	2-Fluorobiphenyl	60 - 140	## [7]
PGD0893-12	2-Fluorobiphenyl	60 - 140	## [7]
PGD0893-13	2-Fluorobiphenyl	60 - 140	## [7]
PGD0893-14	2-Fluorobiphenyl	60 - 140	## [7]
PGD0893-15	2-Fluorobiphenyl	60 - 140	## [7]
PGD0893-16	2-Fluorobiphenyl	60 - 140	## [7]
PGD0893-17	2-Fluorobiphenyl	60 - 140	## [7]
PGD0893-18	2-Fluorobiphenyl	60 - 140	## [7]
PGD0893-19	2-Fluorobiphenyl	60 - 140	## [7]

ORG-029|NAGD Seawater Elutriate - PFAS Extended List - Trace Level (Matrix)| Batch BGD5160

Sample ID	Analyte	% Limits	% Recovery
PGD0893-01	Extraction Internal Standard 13C4 PFBA	50 - 150	30.0 [9]
PGD0893-02	Extraction Internal Standard 13C4 PFBA	50 - 150	26.0 [9]
PGD0893-03	Extraction Internal Standard 13C4 PFBA	50 - 150	30.0 [9]
PGD0893-04	Extraction Internal Standard 13C4 PFBA	50 - 150	31.0 [9]
PGD0893-05	Extraction Internal Standard 13C4 PFBA	50 - 150	26.0 [9]
PGD0893-06	Extraction Internal Standard 13C2 8:2FTS	50 - 150	156 [9]
	Extraction Internal Standard 13C4 PFBA	50 - 150	27.0 [9]
PGD0893-07	Extraction Internal Standard 13C4 PFBA	50 - 150	26.0 [9]
PGD0893-08	Extraction Internal Standard 13C2 8:2FTS	50 - 150	159 [9]
	Extraction Internal Standard 13C4 PFBA	50 - 150	26.0 [9]
PGD0893-09	Extraction Internal Standard 13C2 8:2FTS	50 - 150	162 [9]
	Extraction Internal Standard 13C4 PFBA	50 - 150	24.0 [9]
PGD0893-10	Extraction Internal Standard 13C2 8:2FTS	50 - 150	163 [9]
	Extraction Internal Standard 13C4 PFBA	50 - 150	30.0 [9]
	Extraction Internal Standard d3 N MeFOSAA	50 - 150	49.0 [9]
PGD0893-11	Extraction Internal Standard 13C4 PFBA	50 - 150	27.0 [9]
PGD0893-12	Extraction Internal Standard d3 N MeFOSAA	50 - 150	35.0 [9]

Data Quality Assessment Summary PGD0893

ORG-029|NAGD Seawater Elutriate - PFAS Extended List - Trace Level (Matrix)| Batch BGD5160

Sample ID	Analyte	% Limits	% Recovery
PGD0893-12	Extraction Internal Standard 13C4 PFBA	50 - 150	31.0 [9]
PGD0893-13	Extraction Internal Standard 13C4 PFBA	50 - 150	33.0 [9]
PGD0893-14	Extraction Internal Standard 13C4 PFBA	50 - 150	31.0 [9]
PGD0893-15	Extraction Internal Standard 13C4 PFBA	50 - 150	29.0 [9]
	Extraction Internal Standard d3 N MeFOSAA	50 - 150	35.0 [9]
PGD0893-16	Extraction Internal Standard 13C2 8:2FTS	50 - 150	193 [9]
	Extraction Internal Standard 13C2 6:2FTS	50 - 150	155 [9]
	Extraction Internal Standard 13C4 PFBA	50 - 150	25.0 [9]
	Extraction Internal Standard d5 N EtFOSAA	50 - 150	166 [9]
PGD0893-17	Extraction Internal Standard 13C2 6:2FTS	50 - 150	159 [9]
	Extraction Internal Standard 13C4 PFBA	50 - 150	23.0 [9]
	Extraction Internal Standard 13C2 8:2FTS	50 - 150	167 [9]
PGD0893-18	Extraction Internal Standard 13C4 PFBA	50 - 150	21.0 [9]
	Extraction Internal Standard 13C2 8:2FTS	50 - 150	176 [9]
	Extraction Internal Standard 13C2 6:2FTS	50 - 150	167 [9]
	Extraction Internal Standard d5 N EtFOSAA	50 - 150	160 [9]
PGD0893-19	Extraction Internal Standard 13C3 PFPeA	50 - 150	46.0 [9]
	Extraction Internal Standard 13C4 PFBA	50 - 150	## [9]
	Extraction Internal Standard 13C2 8:2FTS	50 - 150	153 [9]
PGD0893-20	Extraction Internal Standard d5 N EtFOSAA	50 - 150	163 [9]
	Extraction Internal Standard 13C4 PFBA	50 - 150	27.0 [9]
	Extraction Internal Standard 13C2 6:2FTS	50 - 150	163 [9]
	Extraction Internal Standard 13C2 8:2FTS	50 - 150	190 [9]

ORG-029|PFAS Extended List (Matrix)| Batch BGD4309

Sample ID	Analyte	% Limits	% Recovery
PGD0893-01	Extraction Internal Standard 13C2 4:2FTS	50 - 150	49.2
PGD0893-08	Extraction Internal Standard 13C2 4:2FTS	50 - 150	48.9
	Extraction Internal Standard 13C2 PFDoDA	50 - 150	35.1
	Extraction Internal Standard 13C2 PFTeDA	50 - 150	38.4
	Extraction Internal Standard d5 N EtFOSAA	50 - 150	32.8
	Extraction Internal Standard 13C2 PFUnDA	50 - 150	30.2
PGD0893-09	Extraction Internal Standard 13C2 4:2FTS	50 - 150	45.2
PGD0893-11	Extraction Internal Standard 13C2 4:2FTS	50 - 150	45.6

ORG-029|PFAS Extended List (Matrix)| Batch BGD4724

Sample ID	Analyte	% Limits	% Recovery
PGD0893-23	Extraction Internal Standard 13C2 PFTeDA	50 - 150	168
	Extraction Internal Standard 13C2 PFUnDA	50 - 150	154

Data Quality Assessment Summary PGD0893

Outliers: QC Frequency

INORG-004 Elutriate|NAGD Elutriate Extraction (SW) - PFAS (Soil)| Batch BGD4963

Analysis	QC Type	Expected	Reported
Elutriate Extraction SW - PFAS	Duplicate	2	0

ORG-023_F1_TOT|Volatile TRH and BTEX (Water)| Batch BGD3127

Analysis	QC Type	Expected	Reported
vTRH&MBTEXN	Duplicate	1	0
	Matrix Spike	1	0

ORG-029|PFAS Extended List (Soil)| Batch BGD4309

Analysis	QC Type	Expected	Reported
PFAS EXT-ISTD	Matrix Spike	2	1
PFAS-Extended	Matrix Spike	2	1

ORG-029|PFAS Extended List (Water)| Batch BGD4724

Analysis	QC Type	Expected	Reported
PFAS EXT-ISTD	Duplicate	1	0
	Matrix Spike	1	0
PFAS-Extended	Duplicate	1	0
	Matrix Spike	1	0

ORG-029|NAGD Seawater Elutriate - PFAS Extended List - Trace Level (Soil)| Batch BGD5160

Analysis	QC Type	Expected	Reported
PFAS Ext - NAGD Elutriate (SW)	Duplicate	2	0
	Matrix Spike	1	0
PFAS Ext - ISTD NAGD Elutriate (SW)	Duplicate	2	0
	Matrix Spike	1	0

Quality Control PGD0893

ORG-023_F1_TOT | Volatile TRH and BTEX (Water) | Batch BGD3127

Analyte	Units	PQL	Blank	LCS %
TRH C6-C9	µg/L	10	<10	109
TRH C6-C10	µg/L	10	<10	107
Methyl tert butyl ether (MTBE)	µg/L	1.0	<1.0	[NA]
Benzene	µg/L	1.0	<1.0	104
Toluene	µg/L	1.0	<1.0	86.1
Ethylbenzene	µg/L	1.0	<1.0	98.4
meta+para Xylene	µg/L	2.0	<2.0	99.6
ortho-Xylene	µg/L	1.0	<1.0	98.7
Naphthalene (value used in F2 calc)	µg/L	1.0	<1.0	[NA]
Surrogate Dibromofluoromethane	*%*		*96.1*	*93.8*
Surrogate Toluene-D8	*%*		*84.4*	*77.4*
Surrogate 4-Bromofluorobenzene	*%*		*93.8*	*98.0*

ORG-023_F1_TOT | Volatile TRH and BTEX - NAGD (Soil) | Batch BGD3776

Analyte	Units	PQL	Blank	DUP1 PGD0893-01 Samp | QC | RPD %	DUP2 PGD0893-11 Samp | QC | RPD %	LCS %	Spike % PGD0893-02
TRH C6-C9	mg/kg	25	<25	<25 | <25 | [NA]	<25 | <25 | [NA]	119	100
TRH C6-C10	mg/kg	25	<25	<25 | <25 | [NA]	<25 | <25 | [NA]	118	101
TRH C6-C10 less BTEX (F1)	mg/kg	25	<25	<25 | <25 | [NA]	<25 | <25 | [NA]	[NA]	[NA]
Benzene	mg/kg	0.20	<0.20	<0.20 | <0.20 | [NA]	<0.20 | <0.20 | [NA]	89.4	77.4
Toluene	mg/kg	0.20	<0.20	<0.20 | <0.20 | [NA]	<0.20 | <0.20 | [NA]	88.8	76.9
Ethylbenzene	mg/kg	0.20	<0.20	<0.20 | <0.20 | [NA]	<0.20 | <0.20 | [NA]	88.9	75.8
Total Xylene	mg/kg	0.60	<0.60	<0.60 | <0.60 | [NA]	<0.60 | <0.60 | [NA]	[NA]	[NA]
Surrogate aaa-Trifluorotoluene	*%*		*93.7*	*79.4 | 75.7*	*70.3 | 69.0*	*111*	*95.2*

ORG-023_F1_TOT | Volatile TRH and BTEX - NAGD (Soil) | Batch BGD3777

Analyte	Units	PQL	Blank	DUP1 PGD0893-17 Samp | QC | RPD %	DUP2 BGD3777-DUP2# Samp | QC | RPD %	LCS %	Spike % PGD0893-18
TRH C6-C9	mg/kg	25	<25	<25 | <25 | [NA]	<25 | <25 | [NA]	118	77.3
TRH C6-C10	mg/kg	25	<25	<25 | <25 | [NA]	<25 | <25 | [NA]	122	79.4
TRH C6-C10 less BTEX (F1)	mg/kg	25	<25	<25 | <25 | [NA]	<25 | <25 | [NA]	[NA]	[NA]
Benzene	mg/kg	0.20	<0.20	<0.20 | <0.20 | [NA]	<0.20 | <0.20 | [NA]	94.1	62.8
Toluene	mg/kg	0.20	<0.20	<0.20 | <0.20 | [NA]	<0.20 | <0.20 | [NA]	92.4	62.5
Ethylbenzene	mg/kg	0.20	<0.20	<0.20 | <0.20 | [NA]	<0.20 | <0.20 | [NA]	92.0	62.7
Total Xylene	mg/kg	0.60	<0.60	<0.60 | <0.60 | [NA]	<0.60 | <0.60 | [NA]	[NA]	[NA]
Surrogate aaa-Trifluorotoluene	*%*		*97.4*	*75.5 | 72.4*	*94.0 | 88.2*	*114*	*78.8*

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

ORG-020 | Semi-volatile TRH (Water) | Batch BGD3221

Analyte	Units	PQL	Blank	DUP1 PGD0893-21 Samp | QC | RPD %	DUP2 BGD3221-DUP2# Samp | QC | RPD %	LCS %	Spike % BGD3221-MS1#
TRH C10-C14	µg/L	50	<50	<50 | <50 | [NA]	<50 | <50 | [NA]	90.8	84.4
TRH C15-C28	µg/L	100	<100	161 | 154 | [NA]	<100 | <100 | [NA]	89.0	84.9
TRH C29-C36	µg/L	100	<100	<100 | <100 | [NA] [14]	<100 | <100 | [NA]	103	95.3
TRH >C10-C16	µg/L	50	<50	98.5 | 95.8 | [NA]	<50 | <50 | [NA]	91.8	86.5
TRH >C16-C34 (F3)	µg/L	100	<100	<100 | <100 | [NA]	<100 | <100 | [NA]	91.6	87.1
TRH >C34-C40 (F4)	µg/L	100	<100	<100 | <100 | [NA]	<100 | <100 | [NA]	89.4	83.6
Surrogate o-Terphenyl	*%*		*85.4*	*93.3 | 75.2*	*91.9 | 83.5*	*## [6]*	*##[6]*

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

Quality Control PGD0893

ORG-020|Semi-volatile TRH - NAGD (Soil) | Batch BGD3783

Analyte	Units	PQL	Blank	DUP1 PGD0893-01 Samp | QC | RPD %	DUP2 PGD0893-11 Samp | QC | RPD %	LCS %	Spike % PGD0893-02
TRH C10-C14	mg/kg	25	<25	<25 | <25 | [NA]	<25 | <25 | [NA]	99.4	106
TRH C15-C28	mg/kg	25	<25	31.4 | 37.5 | [NA]	<25 | <25 | [NA]	99.2	119
TRH C29-C36	mg/kg	25	<25	95.5 | 108 | [NA]	46.1 | 39.2 | [NA]	92.3	##[5]
TRH >C10-C16	mg/kg	25	<25	<25 | <25 | [NA]	<25 | <25 | [NA]	102	114
TRH >C16-C34 (F3)	mg/kg	25	<25	99.0 | 112 | [NA]	52.8 | 40.6 | [NA]	99.0	123
TRH >C34-C40 (F4)	mg/kg	25	<25	38.8 | 52.8 | [NA]	<25 | <25 | [NA]	99.4	##[5]

ORG-020|Semi-volatile TRH - NAGD (Soil) | Batch BGD3784

Analyte	Units	PQL	Blank	DUP1 PGD0893-22 Samp | QC | RPD %	LCS %	Spike % PGD0893-22
TRH C10-C14	mg/kg	25	<25	<25 | <25 | [NA]	108	105
TRH C15-C28	mg/kg	25	<25	<25 | <25 | [NA]	108	105
TRH C29-C36	mg/kg	25	<25	<25 | <25 | [NA]	116	122
TRH >C10-C16	mg/kg	25	<25	<25 | <25 | [NA]	111	108
TRH >C16-C34 (F3)	mg/kg	25	<25	<25 | <25 | [NA]	109	107
TRH >C34-C40 (F4)	mg/kg	25	<25	<25 | <25 | [NA]	105	108

ORG-022_PAH|Polycyclic Aromatic Hydrocarbons (Water) | Batch BGD3221

Analyte	Units	PQL	Blank	DUP1 PGD0893-21 Samp | QC | RPD %	DUP2 BGD3221-DUP2# Samp | QC | RPD %	LCS %	Spike % BGD3221-MS2#
Naphthalene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	99.1	73.9
Acenaphthylene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	[NA]	[NA]
Acenaphthene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	99.2	73.0
Fluorene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	101	74.8
Phenanthrene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	105	77.3
Anthracene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	[NA]	[NA]
Fluoranthene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	104	77.6
Pyrene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	107	78.7
Benzo(a)anthracene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	[NA]	[NA]
Chrysene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	94.8	70.3
Benzo(b,j,k)fluoranthene	µg/L	0.20	<0.20	<0.20 | <0.20 | [NA]	<0.20 | <0.20 | [NA]	[NA]	[NA]
Benzo(a)pyrene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	98.9	71.4
Indeno(1,2,3-c,d)pyrene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	[NA]	[NA]
Dibenzo(a,h)anthracene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	[NA]	[NA]
Benzo(g,h,i)perylene	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	[NA]	[NA]
Surrogate p-Terphenyl-D14	*%*		*105*	*117 | 93.1*	*108 | 98.4*	*106*	*72.5*

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

Quality Control PGD0893

ORG-022_PAH | Polycyclic Aromatic Hydrocarbons - NAGD (Soil) | Batch BGD3785

Analyte	Units	PQL	Blank	DUP1 PGD0893-01 Samp | QC | RPD %	DUP2 PGD0893-11 Samp | QC | RPD %	LCS %	Spike % PGD0893-02
Naphthalene	µg/kg	5.0	<5.0	10.6 | 10.3 | [NA]	10.1 | 14.4 | [NA]	107	##[4]
2-Methylnaphthalene	µg/kg	5.0	<5.0	8.81 | 9.10 | [NA]	7.27 | 13.7 | [NA] [16]	[NA]	[NA]
Acenaphthylene	µg/kg	5.0	<5.0	45.8 | 43.1 | 6.08	24.8 | 28.4 | 13.6	[NA]	[NA]
Acenaphthene	µg/kg	5.0	<5.0	<5.0 | <5.0 | [NA]	<5.0 | <5.0 | [NA]	[NA]	[NA]
Fluorene	µg/kg	5.0	<5.0	7.24 | 6.79 | [NA]	5.15 | 6.53 | [NA]	99.3	66.8
Phenanthrene	µg/kg	5.0	<5.0	79.7 | 81.5 | 2.31	46.1 | 53.5 | 14.9	104	68.0
Anthracene	µg/kg	5.0	<5.0	33.9 | 35.8 | 5.30	22.4 | 25.4 | [NA]	[NA]	[NA]
Fluoranthene	µg/kg	5.0	<5.0	542 | 467 | 14.9	266 | 250 | [NA]	107	##[2]
Pyrene	µg/kg	5.0	<5.0	658 | 579 | 12.8	356 | 327 | [NA]	109	##[2]
Benzo(a)anthracene	µg/kg	5.0	<5.0	269 | 234 | [NA]	104 | 121 | 15.3	[NA]	[NA]
Chrysene	µg/kg	5.0	<5.0	269 | 234 | [NA]	94.3 | 105 | 10.7	109	##[2]
Benzo(b,j,k)fluoranthene	µg/kg	10	<10	671 | 597 | [NA]	340 | 316 | [NA]	[NA]	[NA]
Benzo(e)pyrene	µg/kg	5.0	<5.0	303 | 272 | [NA]	118 | 130 | 10.2	[NA]	[NA]
Benzo(a)pyrene	µg/kg	5.0	<5.0	456 | 411 | [NA]	223 | 210 | [NA]	128	89.3
Perylene	µg/kg	5.0	<5.0	121 | 106 | [NA]	47.4 | 56.5 | 17.4	[NA]	[NA]
Indeno(1,2,3-c,d)pyrene	µg/kg	5.0	<5.0	319 | 284 | [NA]	157 | 153 | [NA]	[NA]	[NA]
Dibenzo(a,h)anthracene	µg/kg	5.0	<5.0	<100 | <100 | [NA] [13]	<100 | <100 | [NA] [13]	[NA]	[NA]
Benzo(g,h,i)perylene	µg/kg	5.0	<5.0	307 | 262 | [NA]	154 | 144 | [NA]	[NA]	[NA]
Coronene	µg/kg	5.0	<5.0	127 | 112 | [NA]	<100 | <100 | [NA] [13]	[NA]	[NA]
Surrogate p-Terphenyl-D14	*%*		*87.0*	*63.9 / 76.5*	*74.1 / 89.0*	*63.5*	*##[7]*

ORG-022_PAH | Polycyclic Aromatic Hydrocarbons - NAGD (Soil) | Batch BGD3786

Analyte	Units	PQL	Blank	DUP1 PGD0893-22 Samp | QC | RPD %	LCS %	Spike % PGD0893-22
Naphthalene	µg/kg	5.0	<5.0	<5.0 | <5.0 | [NA]	104	69.4
2-Methylnaphthalene	µg/kg	5.0	<5.0	<5.0 | <5.0 | [NA]	[NA]	[NA]
Acenaphthylene	µg/kg	5.0	<5.0	<5.0 | <5.0 | [NA]	[NA]	[NA]
Acenaphthene	µg/kg	5.0	<5.0	<5.0 | <5.0 | [NA]	[NA]	[NA]
Fluorene	µg/kg	5.0	<5.0	<5.0 | <5.0 | [NA]	98.7	78.0
Phenanthrene	µg/kg	5.0	<5.0	<5.0 | <5.0 | [NA]	119	83.7
Anthracene	µg/kg	5.0	<5.0	<5.0 | <5.0 | [NA]	[NA]	[NA]
Fluoranthene	µg/kg	5.0	<5.0	<5.0 | <5.0 | [NA]	125	95.1
Pyrene	µg/kg	5.0	<5.0	<5.0 | <5.0 | [NA]	123	95.5
Benzo(a)anthracene	µg/kg	5.0	<5.0	<5.0 | <5.0 | [NA]	[NA]	[NA]
Chrysene	µg/kg	5.0	<5.0	<5.0 | <5.0 | [NA]	112	89.4
Benzo(b,j,k)fluoranthene	µg/kg	10	<10	<10 | <10 | [NA]	[NA]	[NA]
Benzo(e)pyrene	µg/kg	5.0	<5.0	<5.0 | <5.0 | [NA]	[NA]	[NA]
Benzo(a)pyrene	µg/kg	5.0	<5.0	<5.0 | <5.0 | [NA]	125	120
Perylene	µg/kg	5.0	<5.0	<5.0 | <5.0 | [NA]	[NA]	[NA]
Indeno(1,2,3-c,d)pyrene	µg/kg	5.0	<5.0	<5.0 | <5.0 | [NA]	[NA]	[NA]
Dibenzo(a,h)anthracene	µg/kg	5.0	<5.0	<5.0 | <5.0 | [NA]	[NA]	[NA]
Benzo(g,h,i)perylene	µg/kg	5.0	<5.0	<5.0 | <5.0 | [NA]	[NA]	[NA]
Coronene	µg/kg	5.0	<5.0	<5.0 | <5.0 | [NA]	[NA]	[NA]
Surrogate p-Terphenyl-D14	*%*		*79.2*	*131 / 73.2*	*70.5*	*84.8*

ORG-022 | Organochlorine Pesticides (Soil) | Batch BGD3792

Analyte	Units	PQL	Blank	DUP1 PGD0893-01 Samp | QC | RPD %	DUP2 PGD0893-11 Samp | QC | RPD %	LCS %	Spike % PGD0893-02
Toxaphene	mg/kg	2.0	<2.0	<10 | <10 | [NA] [13]	<10 | <10 | [NA] [13]	[NA]	[NA]
Surrogate p-Terphenyl-D14	*%*		*97.8*	*85.1 / 82.5*	*105 / 102*	*99.5*	*102*

Quality Control PGD0893

ORG-022|Organochlorine Pesticides (Soil) | Batch BGD3793

Analyte	Units	PQL	Blank	DUP1 PGD0893-17 Samp | QC | RPD %	DUP2 BGD3793-DUP2# Samp | QC | RPD %	LCS %	Spike % PGD0893-18
Toxaphene	mg/kg	2.0	<2.0	<10 | <10 | [NA] [13]	<10 | <10 | [NA] [13]	[NA]	[NA]
Surrogate p-Terphenyl-D14	*%*		*107*	*88.4 | 103*	*94.1 | 101*	*110*	*111*

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

ORG-022|Organochlorine Pesticides (Water) | Batch BGD3221

Analyte	Units	PQL	Blank	DUP3 PGD0893-21 Samp | QC | RPD %	DUP4 BGD3221-DUP4# Samp | QC | RPD %	LCS %	Spike % BGD3221-MS4#
Toxaphene	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	[NA]	[NA]
alpha-BHC	µg/L	0.20	<0.20	<0.20 | <0.20 | [NA]	<0.20 | <0.20 | [NA]	99.7	74.9
Hexachlorobenzene	µg/L	0.20	<0.20	<0.20 | <0.20 | [NA]	<0.20 | <0.20 | [NA]	[NA]	[NA]
beta-BHC	µg/L	0.20	<0.20	<0.20 | <0.20 | [NA]	<0.20 | <0.20 | [NA]	97.0	74.6
gamma-BHC	µg/L	0.20	<0.20	<0.20 | <0.20 | [NA]	<0.20 | <0.20 | [NA]	[NA]	[NA]
delta-BHC	µg/L	0.20	<0.20	<0.20 | <0.20 | [NA]	<0.20 | <0.20 | [NA]	[NA]	[NA]
Heptachlor	µg/L	0.20	<0.20	<0.20 | <0.20 | [NA]	<0.20 | <0.20 | [NA]	110	81.9
Aldrin	µg/L	0.20	<0.20	<0.20 | <0.20 | [NA]	<0.20 | <0.20 | [NA]	88.8	63.3
Heptachlor epoxide	µg/L	0.20	<0.20	<0.20 | <0.20 | [NA]	<0.20 | <0.20 | [NA]	110	82.6
trans-Chlordane	µg/L	0.20	<0.20	<0.20 | <0.20 | [NA]	<0.20 | <0.20 | [NA]	[NA]	[NA]
cis-Chlordane	µg/L	0.20	<0.20	<0.20 | <0.20 | [NA]	<0.20 | <0.20 | [NA]	[NA]	[NA]
Endosulfan I	µg/L	0.20	<0.20	<0.20 | <0.20 | [NA]	<0.20 | <0.20 | [NA]	[NA]	[NA]
4,4'-DDE	µg/L	0.20	<0.20	<0.20 | <0.20 | [NA]	<0.20 | <0.20 | [NA]	102	73.8
Dieldrin	µg/L	0.20	<0.20	<0.20 | <0.20 | [NA]	<0.20 | <0.20 | [NA]	104	77.3
Endrin	µg/L	0.20	<0.20	<0.20 | <0.20 | [NA]	<0.20 | <0.20 | [NA]	101	76.5
4,4'-DDD	µg/L	0.20	<0.20	<0.20 | <0.20 | [NA]	<0.20 | <0.20 | [NA]	107	79.3
Endosulfan II	µg/L	0.20	<0.20	<0.20 | <0.20 | [NA]	<0.20 | <0.20 | [NA]	[NA]	[NA]
Endrin aldehyde	µg/L	0.20	<0.20	<0.20 | <0.20 | [NA]	<0.20 | <0.20 | [NA]	[NA]	[NA]
4,4'-DDT	µg/L	0.20	<0.20	<0.20 | <0.20 | [NA]	<0.20 | <0.20 | [NA]	[NA]	[NA]
Endosulfan sulfate	µg/L	0.20	<0.20	<0.20 | <0.20 | [NA]	<0.20 | <0.20 | [NA]	105	79.4
Endrin ketone	µg/L	0.20	<0.20	<0.20 | <0.20 | [NA]	<0.20 | <0.20 | [NA]	[NA]	[NA]
Methoxychlor	µg/L	0.20	<0.20	<0.20 | <0.20 | [NA]	<0.20 | <0.20 | [NA]	[NA]	[NA]
Mirex	µg/L	0.20	<0.20	<0.20 | <0.20 | [NA]	<0.20 | <0.20 | [NA]	[NA]	[NA]
Surrogate 4-chloro-3-nitrobenzotrifluoride	*%*		*102*	*115 | 92.1*	*105 | 98.4*	*104*	*76.2*
Surrogate p-Terphenyl-D14	*%*		*88.3*	*73.5 | 67.7*	*78.0 | 74.8*	*87.4*	*76.8*

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

Quality Control PGD0893

ORG-025|Organochlorine Pesticides - ANZG (Soil) | Batch BGD3785

Analyte	Units	PQL	Blank	DUP1 PGD0893-01 Samp | QC | RPD %	DUP2 PGD0893-11 Samp | QC | RPD %	LCS %	Spike % PGD0893-02
alpha-BHC	µg/kg	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	107	85.7
Hexachlorobenzene	µg/kg	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	[NA]	[NA]
beta-BHC	µg/kg	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	109	96.3
gamma-BHC	µg/kg	0.30	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	[NA]	[NA]
delta-BHC	µg/kg	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	[NA]	[NA]
Heptachlor	µg/kg	1.0	<1.0	<20 | <20 | [NA] [13]	<20 | <20 | [NA] [13]	112	76.7
Aldrin	µg/kg	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	94.0	##[4]
Heptachlor epoxide	µg/kg	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	101	91.0
trans-Chlordane	µg/kg	0.50	<0.50	<0.50 | <0.50 | [NA]	<0.50 | <0.50 | [NA]	[NA]	[NA]
cis-Chlordane	µg/kg	0.50	<0.50	<0.50 | <0.50 | [NA]	<0.50 | <0.50 | [NA]	[NA]	[NA]
Endosulfan I	µg/kg	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	[NA]	[NA]
4,4'-DDE	µg/kg	1.0	<1.0	<20 | <20 | [NA] [8][13]	<20 | <20 | [NA] [8][13]	106	96.2[8]
Dieldrin	µg/kg	0.20	<1.0	<20 | <20 | [NA] [13]	<20 | <20 | [NA] [13]	108	72.7
Endrin	µg/kg	0.20	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	116	116
4,4'-DDD	µg/kg	1.0	<1.0	<20 | <20 | [NA] [8][13]	<20 | <20 | [NA] [8][13]	107	102[8][13]
Endosulfan II	µg/kg	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	[NA]	[NA]
4,4'-DDT	µg/kg	1.0	<1.0	<20 | <20 | [NA] [8][13]	<20 | <20 | [NA] [8][13]	[NA]	[NA]
Endosulfan sulfate	µg/kg	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	103	113
Endrin ketone	µg/kg	1.0	<1.0	<20 | <20 | [NA] [13]	<20 | <20 | [NA] [13]	[NA]	[NA]
Methoxychlor	µg/kg	1.0	<1.0	<20 | <20 | [NA] [13]	<20 | <20 | [NA] [13]	[NA]	[NA]
Mirex	µg/kg	2.0	<2.0	<2.0 | <2.0 | [NA]	<2.0 | <2.0 | [NA]	[NA]	[NA]
Surrogate 4-chloro-3-nitrobenzotrifluoride	*%*		*70.9*	*##|##[NA] [7]*	*##|##[NA] [7]*	*61.8*	*##[7]*

ORG-025|Organochlorine Pesticides - ANZG (Soil) | Batch BGD3786

Analyte	Units	PQL	Blank	DUP1 PGD0893-22 Samp | QC | RPD %	LCS %	Spike % PGD0893-22
Chlordane	µg/kg		<1.0	<1.0 | <1.0 | [NA]	[NA]	[NA]
alpha-BHC	µg/kg	1.0	<1.0	<1.0 | <1.0 | [NA]	107	79.7
Hexachlorobenzene	µg/kg	1.0	<1.0	<1.0 | <1.0 | [NA]	[NA]	[NA]
beta-BHC	µg/kg	1.0	<1.0	<1.0 | <1.0 | [NA]	103	79.8
gamma-BHC	µg/kg	0.30	<0.30	<0.30 | <0.30 | [NA]	[NA]	[NA]
delta-BHC	µg/kg	1.0	<1.0	<1.0 | <1.0 | [NA]	[NA]	[NA]
Heptachlor	µg/kg	1.0	<1.0	<1.0 | <1.0 | [NA]	116	84.9
Aldrin	µg/kg	1.0	<1.0	<1.0 | <1.0 | [NA]	105	82.2
Heptachlor epoxide	µg/kg	1.0	<1.0	<1.0 | <1.0 | [NA]	114	87.8
trans-Chlordane	µg/kg	0.50	<0.50	<0.50 | <0.50 | [NA]	[NA]	[NA]
cis-Chlordane	µg/kg	0.50	<0.50	<0.50 | <0.50 | [NA]	[NA]	[NA]
Endosulfan I	µg/kg	1.0	<1.0	<1.0 | <1.0 | [NA]	[NA]	[NA]
4,4'-DDE	µg/kg	1.0	<1.0	<1.0 | <1.0 | [NA]	121	94.5
Dieldrin	µg/kg	0.20	<0.20	<0.20 | <0.20 | [NA]	122	98.0
Endrin	µg/kg	0.20	<0.20	<0.20 | <0.20 | [NA]	127	105
4,4'-DDD	µg/kg	1.0	<1.0	<1.0 | <1.0 | [NA]	117	97.7
Endosulfan II	µg/kg	1.0	<1.0	<1.0 | <1.0 | [NA]	[NA]	[NA]
Endrin aldehyde	µg/kg	1.0	<1.0	<1.0 | <1.0 | [NA]	[NA]	[NA]
4,4'-DDT	µg/kg	1.0	<1.0	<1.0 | <1.0 | [NA]	[NA]	[NA]
Endosulfan sulfate	µg/kg	1.0	<1.0	<1.0 | <1.0 | [NA]	123	96.4
Endrin ketone	µg/kg	1.0	<1.0	<1.0 | <1.0 | [NA]	[NA]	[NA]
Methoxychlor	µg/kg	1.0	<1.0	<1.0 | <1.0 | [NA]	[NA]	[NA]
Mirex	µg/kg	2.0	<2.0	<2.0 | <2.0 | [NA]	[NA]	[NA]
Surrogate 4-chloro-3-nitrobenzotrifluoride	*%*		*73.3*	*110|62.2*	*66.0*	*70.2*

Quality Control PGD0893

ORG-021/022/025_PCB|Polychlorinated Biphenyls (Water) | Batch BGD3221

Analyte	Units	PQL	Blank	DUP1 PGD0893-21 Samp | QC | RPD %	DUP2 BGD3221-DUP2# Samp | QC | RPD %	LCS %	Spike % BGD3221-MS2#
Aroclor 1016	µg/L	2.0	<2.0	<2.0 | <2.0 | [NA]	<2.0 | <2.0 | [NA]	[NA]	[NA]
Aroclor 1221	µg/L	2.0	<2.0	<2.0 | <2.0 | [NA]	<2.0 | <2.0 | [NA]	[NA]	[NA]
Aroclor 1232	µg/L	2.0	<2.0	<2.0 | <2.0 | [NA]	<2.0 | <2.0 | [NA]	[NA]	[NA]
Aroclor 1242	µg/L	2.0	<2.0	<2.0 | <2.0 | [NA]	<2.0 | <2.0 | [NA]	[NA]	[NA]
Aroclor 1248	µg/L	2.0	<2.0	<2.0 | <2.0 | [NA]	<2.0 | <2.0 | [NA]	[NA]	[NA]
Aroclor 1254	µg/L	2.0	<2.0	<2.0 | <2.0 | [NA]	<2.0 | <2.0 | [NA]	[NA]	[NA]
Aroclor 1260	µg/L	2.0	<2.0	<2.0 | <2.0 | [NA]	<2.0 | <2.0 | [NA]	[NA]	[NA]
PCB C103	µg/L			0.00 | 0.00 | [NA]	0.00 | 0.00 | [NA]	111	81.5
Surrogate 2-Fluorobiphenyl	*%*		*102*	*119 | 91.2*	*103 | 96.1*	*102*	*74.3*

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

ORG-025|Polychlorinated Biphenyls - NAGD (Soil) | Batch BGD3785

Analyte	Units	PQL	Blank	DUP1 PGD0893-01 Samp | QC | RPD %	DUP2 PGD0893-11 Samp | QC | RPD %	LCS %	Spike % PGD0893-02
PCB C103	µg/kg			<0.50 | <0.50 | [NA]	<0.50 | <0.50 | [NA]	102	92.4
Total PCBs	µg/kg	5.0	<5.0	<5.0 | <5.0 | [NA]	<5.0 | <5.0 | [NA]	[NA]	[NA]
Surrogate 2-Fluorobiphenyl	*%*		*79.4*	*##|##[NA] [7]*	*##|##[NA] [7]*	*65.6*	*##[7]*

ORG-025|Polychlorinated Biphenyls - NAGD (Soil) | Batch BGD3786

Analyte	Units	PQL	Blank	DUP1 PGD0893-22 Samp | QC | RPD %	LCS %	Spike % PGD0893-22
PCB C103	µg/kg			<0.50 | <0.50 | [NA]	116	85.4
Total PCBs	µg/kg	5.0	<5.0	<5.0 | <5.0 | [NA]	[NA]	[NA]
Surrogate 2-Fluorobiphenyl	*%*		*79.6*	*121 | 72.9*	*70.7*	*77.8*

ORG-022|Synthetic Pyrethroids (Soil) | Batch BGD3785

Analyte	Units	PQL	Blank	DUP1 PGD0893-01 Samp | QC | RPD %	DUP2 PGD0893-11 Samp | QC | RPD %	LCS %	Spike % PGD0893-02
Bifenthrin	µg/kg	10	<10	18.9 | 28.5 | [NA]	<10 | <10 | [NA]	136	##[4]
lamda-Cyhalothrin	µg/kg	10	<10	<10 | <10 | [NA]	<10 | <10 | [NA]	121	##[4]
cis-Permethrin	µg/kg	10	<10	<10 | <10 | [NA]	<10 | <10 | [NA]	[NA]	[NA]
trans-Permethrin	µg/kg	10	<10	<10 | <10 | [NA]	<10 | <10 | [NA]	[NA]	[NA]
Cyfluthrin	µg/kg	100	<100	<100 | <100 | [NA]	<100 | <100 | [NA]	[NA]	[NA]
Cypermethrin	µg/kg	100	<100	<100 | <100 | [NA]	<100 | <100 | [NA]	[NA]	[NA]
Esfenvalerate	µg/kg	10	<10	<10 | <10 | [NA]	<10 | <10 | [NA]	[NA]	[NA]
Deltamethrin	µg/kg	10	<10	<200 | <200 | [NA] [13]	<200 | <200 | [NA] [13]	[NA]	[NA]
Surrogate p-Terphenyl-D14	*%*		*87.0*	*63.9 | 76.5*	*74.1 | 89.0*	*63.5*	*##[7]*

ORG-022|Synthetic Pyrethroids (Soil) | Batch BGD3786

Analyte	Units	PQL	Blank	DUP1 PGD0893-22 Samp | QC | RPD %	LCS %	Spike % PGD0893-22
Bifenthrin	µg/kg	10	<10	<10 | <10 | [NA]	128	135
lamda-Cyhalothrin	µg/kg	10	<10	<10 | <10 | [NA]	118	108
cis-Permethrin	µg/kg	10	<10	<10 | <10 | [NA]	[NA]	[NA]
trans-Permethrin	µg/kg	10	<10	<10 | <10 | [NA]	[NA]	[NA]
Cyfluthrin	µg/kg	100	<100	<100 | <100 | [NA]	[NA]	[NA]
Cypermethrin	µg/kg	100	<100	<100 | <100 | [NA]	[NA]	[NA]
Esfenvalerate	µg/kg	10	<10	<10 | <10 | [NA]	[NA]	[NA]
Deltamethrin	µg/kg	10	<10	<10 | <10 | [NA]	[NA]	[NA]
Surrogate p-Terphenyl-D14	*%*		*79.2*	*131 | 73.2*	*70.5*	*84.8*

Quality Control PGD0893

ORG-029|Diuron/Fluometuron (Soil) | Batch BGD3289

Analyte	Units	PQL	Blank	DUP2 PGD0893-01 Samp | QC | RPD %	LCS %	Spike % PGD0893-02
Fluometuron	µg/kg	10	<10	<10 | <10 | [NA]	131	112
Diuron	µg/kg	10	<10	<10 | <10 | [NA]	117	114
Surrogate Terbuthylazine-d5	*%*		*98.7*	*88.9 | 68.8*	*69.9*	*87.5*

ORG-029|Diuron/Fluometuron (Soil) | Batch BGD3290

Analyte	Units	PQL	Blank	DUP1 PGD0893-19 Samp | QC | RPD %	LCS %	Spike % PGD0893-20
Fluometuron	µg/kg	10	<10	<10 | <10 | [NA]	112	104
Diuron	µg/kg	10	<10	<10 | <10 | [NA]	111	113
Surrogate Terbuthylazine-d5	*%*		*82.8*	*70.3 | 62.1*	*90.4*	*64.1*

ORG-029|Diuron/Fluometuron (Water) | Batch BGD3375

Analyte	Units	PQL	Blank	DUP1 PGD0893-21 Samp | QC | RPD %	LCS %	Spike % BGD3375-MS1#
Fluometuron	µg/L	0.020	<0.020	<0.020 | <0.020 | [NA]	99.5	112
Diuron	µg/L	0.020	<0.020	<0.020 | <0.020 | [NA]	100	96.4
Surrogate Terbuthylazine-d5	*%*		*100*	*101 | 97.8*	*96.8*	*103*

ORG-025_TBT_S|Organometallics (Soil) | Batch BGD3781

Analyte	Units	PQL	Blank	DUP1 PGD0893-01 Samp | QC | RPD %	DUP2 PGD0893-11 Samp | QC | RPD %	LCS %	Spike % PGD0893-02
Monobutyltin	µg/kg	20		<100 | <20 | [NA] [12]	<100 | <100 | [NA] [12]	[NA]	[NA]
Monobutyltin as Sn	µg/kg	20	<20	<100 | <20 | [NA] [12]	<100 | <100 | [NA] [12]	[NA]	[NA]
Dibutyltin	µg/kg	0.5		<5.00 | <0.50 | [NA] [12]	18.7 | 26.1 | [NA]	105	90.4
Dibutyltin as Sn	µg/kg	0.50	<0.50	<5.00 | <0.50 | [NA] [12]	9.52 | 13.3 | [NA]	[NA]	[NA]
Tributyltin	µg/kg	0.5		<5.0 | <5.0 | [NA] [12]	<12 | <12 | [NA] [12]	108	68.0
Tributyltin as Sn	µg/kg	0.50	<0.50	<5.0 | <5.0 | [NA] [12]	<5.0 | <5.0 | [NA] [12]	[NA]	[NA]
Surrogate Triphenyltin	*%*		*101*	*91.0 | 89.8*	*94.9 | 92.5*	*99.6*	*97.7*

ORG-025_TBT_S|Organometallics (Soil) | Batch BGD3782

Analyte	Units	PQL	Blank	DUP1 PGD0893-22 Samp | QC | RPD %	LCS %	Spike % PGD0893-22
Monobutyltin	µg/kg	20		<20 | <20 | [NA]	[NA]	[NA]
Monobutyltin as Sn	µg/kg	20	<20	<20 | <20 | [NA]	[NA]	[NA]
Dibutyltin	µg/kg	0.5		<0.50 | <0.50 | [NA]	104	112
Dibutyltin as Sn	µg/kg	0.50	<0.50	<0.50 | <0.50 | [NA]	[NA]	[NA]
Tributyltin	µg/kg	0.5		<0.50 | <0.50 | [NA]	108	118
Tributyltin as Sn	µg/kg	0.50	<0.50	<0.50 | <0.50 | [NA]	[NA]	[NA]
Surrogate Triphenyltin	*%*		*102*	*103 | 102*	*103*	*98.0*

ORG-025_TBT_W|Organometallics (Water) | Batch BGD4111

Analyte	Units	PQL	Blank	DUP1 PGD0893-23 Samp | QC | RPD %	LCS %	Spike % PGD0893-23
Monobutyltin	µg/L	0.02		<0.020 | <0.020 | [NA]	[NA]	[NA]
Monobutyltin as Sn	µg/L	0.020	<0.020	<0.020 | <0.020 | [NA]	[NA]	[NA]
Dibutyltin	µg/L	0.002		<0.0020 | <0.0020 | [NA]	103	98.6
Dibutyltin as Sn	µg/L	0.0020	<0.0020	<0.0020 | <0.0020 | [NA]	[NA]	[NA]
Tributyltin	µg/L	0.002		<0.0020 | <0.0020 | [NA]	99.5	108
Tributyltin as Sn	µg/L	0.0020	<0.0020	<0.0020 | <0.0020 | [NA]	[NA]	[NA]
Surrogate Triphenyltin	*%*		*99.2*	*103 | 101*	*99.5*	*103*

Quality Control PGD0893

ORG-022|ADWG - GCMS SVOCs (Soil) | Batch BGD3792

Analyte	Units	PQL	Blank	DUP1 PGD0893-01 Samp | QC | RPD %	DUP2 PGD0893-11 Samp | QC | RPD %	LCS %	Spike % PGD0893-02
Chlorothalonil	µg/kg	500	<500	<500 | <500 | [NA]	<500 | <500 | [NA]	128	81.4
Surrogate p-Terphenyl-D14	*%*		*108*	*107 | 86.1*	*93.3 | 94.0*	*99.0*	*98.8*

ORG-022|ADWG - GCMS SVOCs (Soil) | Batch BGD3793

Analyte	Units	PQL	Blank	DUP1 PGD0893-17 Samp | QC | RPD %	DUP2 BGD3793-DUP2# Samp | QC | RPD %	LCS %	Spike % PGD0893-18
Chlorothalonil	µg/kg	500	<500	<500 | <500 | [NA]	<500 | <500 | [NA]	110	##[4]
Surrogate p-Terphenyl-D14	*%*		*80.4*	*82.8 | 86.9*	*96.1 | 107*	*88.3*	*80.8*

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

ORG-022_W|ADWG - GCMS SVOCs (Water) | Batch BGD3221

Analyte	Units	PQL	Blank	DUP1 PGD0893-21 Samp | QC | RPD %	DUP2 BGD3221-DUP2# Samp | QC | RPD %	LCS %	Spike % BGD3221-MS3#
Fluazifop-p-butyl	µg/L	0.50	<0.50	<0.50 | <0.50 | [NA]	<0.50 | <0.50 | [NA]	95.2	108
Dichlobenil	µg/L	0.50	<0.50	<0.50 | <0.50 | [NA]	<0.50 | <0.50 | [NA]	80.4	88.2
Etridiazole	µg/L	0.50	<0.50	<0.50 | <0.50 | [NA]	<0.50 | <0.50 | [NA]	95.0	107
Vernolate	µg/L	0.50	<0.50	<0.50 | <0.50 | [NA]	<0.50 | <0.50 | [NA]	78.1	89.5
Pebulate	µg/L	0.50	<0.50	<0.50 | <0.50 | [NA]	<0.50 | <0.50 | [NA]	78.1	88.5
Propachlor	µg/L	0.50	<0.50	<0.50 | <0.50 | [NA]	<0.50 | <0.50 | [NA]	78.0	93.8
Chlorothalonil	µg/L	0.50	<0.50	<0.50 | <0.50 | [NA]	<0.50 | <0.50 | [NA]	102	112
Pirimicarb	µg/L	0.50	<0.50	<0.50 | <0.50 | [NA]	<0.50 | <0.50 | [NA]	[NA]	[NA]
Pronamide	µg/L	0.50	<0.50	<0.50 | <0.50 | [NA]	<0.50 | <0.50 | [NA]	91.2	101
Terbacil	µg/L	0.50	<0.50	<0.50 | <0.50 | [NA]	<0.50 | <0.50 | [NA]	82.6	90.8
Metalaxyl	µg/L	0.50	<0.50	<0.50 | <0.50 | [NA]	<0.50 | <0.50 | [NA]	90.6	103
Triadimefon	µg/L	0.50	<0.50	<0.50 | <0.50 | [NA]	<0.50 | <0.50 | [NA]	85.1	93.5
Fipronil	µg/L	0.50	<0.50	<0.50 | <0.50 | [NA]	<0.50 | <0.50 | [NA]	97.1	118
Napropamide	µg/L	0.50	<0.50	<0.50 | <0.50 | [NA]	<0.50 | <0.50 | [NA]	89.6	99.9
Flamprop-methyl	µg/L	0.50	<0.50	<0.50 | <0.50 | [NA]	<0.50 | <0.50 | [NA]	84.9	96.7
Procymidome	µg/L	0.50	<0.50	<0.50 | <0.50 | [NA]	<0.50 | <0.50 | [NA]	92.5	100
Hexaconazole	µg/L	0.50	<0.50	<0.50 | <0.50 | [NA]	<0.50 | <0.50 | [NA]	88.8	104
Diclofop Methyl	µg/L	0.50	<0.50	<0.50 | <0.50 | [NA]	<0.50 | <0.50 | [NA]	91.5	97.8
Propargite	µg/L	0.50	<0.50	<0.50 | <0.50 | [NA]	<0.50 | <0.50 | [NA]	82.1	101
Bioresmethrin	µg/L	0.50	<0.50	<0.50 | <0.50 | [NA]	<0.50 | <0.50 | [NA]	[NA]	[NA]
Piperonyl butoxide	µg/L	0.50	<0.50	<0.50 | <0.50 | [NA]	<0.50 | <0.50 | [NA]	85.5	96.1
Fenarimol	µg/L	0.50	<0.50	<0.50 | <0.50 | [NA]	<0.50 | <0.50 | [NA]	80.3	100
Hexachlorophene	µg/L	0.50	<0.50	<0.50 | <0.50 | [NA]	<0.50 | <0.50 | [NA]	[NA]	[NA]
Fluridone	µg/L	0.50	<0.50	<0.50 | <0.50 | [NA]	<0.50 | <0.50 | [NA]	95.8	117
Esfenvalerate	µg/L	0.50	<0.50	<0.50 | <0.50 | [NA]	<0.50 | <0.50 | [NA]	83.3	97.4
Azoxystrobin	µg/L	0.50	<0.50	<0.50 | <0.50 | [NA]	<0.50 | <0.50 | [NA]	72.3	110
Surrogate p-Terphenyl-D14	*%*		*103*	*117 | 96.4*	*98.2 | 97.1*	*93.1*	*96.9*

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

METALS-020|Acid Extractable Metals (Soil) | Batch BGD3775

Analyte	Units	PQL	Blank	DUP1 PGD0893-17 Samp | QC | RPD %	DUP2 PGD0893-17 Samp | QC | RPD %	LCS %	Spike % PGD0893-18
Chromium	mg/kg	1.0	<1.0	44.4 | 41.7 | 6.43	44.4 | 42.7 | 3.92	91.6	97.1

Analyte	Units	PQL	Blank	DUP3 BGD3775-DUP3# Samp | QC | RPD %	DUP4 BGD3775-DUP4# Samp | QC | RPD %	LCS %
Chromium	mg/kg	1		9.06 | 12.4 | 30.9	9.06 | 12.6 | 32.5	[NA]

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

Quality Control PGD0893

METALS-020|Acid Extractable Metals (Soil) | Batch BGD3791

Analyte	Units	PQL	Blank	DUP1 PGD0893-01 Samp | QC | RPD %	DUP2 PGD0893-01 Samp | QC | RPD %	LCS %	Spike % PGD0893-02
Chromium	mg/kg	1.0	<1.0	50.6 | 54.0 | 6.60	50.6 | 55.0 | 8.40	95.4	99.8

Analyte	Units	PQL	Blank	DUP3 PGD0893-11 Samp | QC | RPD %	DUP4 PGD0893-11 Samp | QC | RPD %	LCS %
Chromium	mg/kg	1		74.8 | 73.1 | 2.36	74.8 | 74.1 | 0.960	[NA]

METALS-020|Acid Extractable Metals (Water) | Batch BGD3393

Analyte	Units	PQL	Blank	DUP1 PGD0893-23 Samp | QC | RPD %	DUP2 BGD3393-DUP2# Samp | QC | RPD %	LCS %	Spike % BGD3393-MS1#
Phosphorus	mg/L	0.050	<0.050	<0.25 | <0.25 | [NA]	<0.050 | <0.050 | [NA]	99.8	##[2]

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

Quality Control PGD0893

METALS-022|Acid Extractable Low Level Metals (Soil) | Batch BGD3775

Analyte	Units	PQL	Blank	DUP1 PGD0893-17 Samp | QC | RPD %	DUP2 PGD0893-17 Samp | QC | RPD %	LCS %	Spike % PGD0893-18
Aluminium	mg/kg	1.0	<1.0	24800 | 23400 | 5.73	24800 | 24100 | 2.93	81.0	##[2]
Antimony	mg/kg	0.50	<0.50	<0.50 | <0.50 | [NA]	<0.50 | <0.50 | [NA]	106	90.3
Arsenic	mg/kg	0.50	<0.50	9.80 | 9.09 | 7.49	9.80 | 8.87 | 10.0	100	94.0
Barium	mg/kg	0.50	<0.50	14.2 | 13.8 | 3.17	14.2 | 14.2 | 0.319	101	102
Beryllium	mg/kg	0.50	<0.50	0.811 | 0.767 | [NA]	0.811 | 0.781 | [NA]	97.9	89.7
Boron	mg/kg	2.0	<2.0	54.1 | 52.5 | 3.16	54.1 | 52.8 | 2.51	91.1	92.9
Cadmium	mg/kg	0.10	<0.10	0.103 | <0.10 | [NA] [14]	0.103 | 0.107 | [NA]	98.8	96.6
Cobalt	mg/kg	0.50	<0.50	8.83 | 8.16 | 7.85	8.83 | 8.32 | 5.86	106	99.7
Copper	mg/kg	0.50	<0.50	69.2 | 63.3 | 8.79	69.2 | 65.0 | 6.25	100	102
Iron	mg/kg	1.0	<1.0	26400 | 24800 | 6.45	26400 | 25100 | 5.17	103	##[2]
Lead	mg/kg	0.50	<0.50	67.8 | 63.4 | 6.68	67.8 | 64.3 | 5.31	102	95.7
Manganese	mg/kg	0.50	<0.50	193 | 179 | 7.74	193 | 176 | 9.41	90.7	96.7
Mercury	mg/kg	0.010	<0.010	0.140 | 0.128 | 8.87	0.140 | 0.126 | 10.1	122	86.8
Molybdenum	mg/kg	0.50	<0.50	2.10 | 2.27 | [NA]	2.10 | 1.99 | [NA]	94.5	101
Nickel	mg/kg	0.50	<0.50	14.9 | 14.0 | 5.90	14.9 | 14.2 | 4.36	98.9	101
Selenium	mg/kg	0.20	<0.20	0.651 | 0.650 | [NA]	0.651 | 0.607 | [NA]	113	100
Silver	mg/kg	0.10	<0.10	0.174 | 0.167 | [NA]	0.174 | 0.173 | [NA]	97.4	94.7
Vanadium	mg/kg	0.50	<0.50	53.5 | 49.5 | 7.69	53.5 | 50.5 | 5.80	97.1	103
Zinc	mg/kg	0.50	<0.50	230 | 212 | 8.38	230 | 218 | 5.35	102	105

Analyte	Units	PQL	Blank	DUP3 BGD3775-DUP3# Samp | QC | RPD %	DUP4 BGD3775-DUP4# Samp | QC | RPD %	LCS %
Aluminium	mg/kg	1		2180 | 3350 | 42.1 [15]	2180 | 2550 | 15.5	[NA]
Antimony	mg/kg	0.5		<0.50 | <0.50 | [NA]	<0.50 | <0.50 | [NA]	[NA]
Arsenic	mg/kg	0.5		2.16 | 3.12 | 36.6	2.16 | 3.45 | 46.1 [15]	[NA]
Barium	mg/kg	0.5		14.4 | 18.5 | 24.8	14.4 | 60.6 | 123 [15]	[NA]
Beryllium	mg/kg	0.5		<0.50 | <0.50 | [NA]	<0.50 | <0.50 | [NA]	[NA]
Boron	mg/kg	2		7.54 | 9.46 | [NA]	7.54 | 10.1 | [NA]	[NA]
Cadmium	mg/kg	0.1		<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	[NA]
Cobalt	mg/kg	0.5		1.18 | 0.890 | [NA]	1.18 | 0.866 | [NA]	[NA]
Copper	mg/kg	0.5		9.54 | 10.4 | 8.87	9.54 | 9.12 | 4.49	[NA]
Iron	mg/kg	1		3560 | 4710 | 27.9	3560 | 66400 | 180 [15]	[NA]
Lead	mg/kg	0.5		43.1 | 54.9 | 24.2	43.1 | 48.9 | 12.6	[NA]
Manganese	mg/kg	0.5		27.4 | 26.8 | 2.26	27.4 | 67.0 | 83.8 [15]	[NA]
Mercury	mg/kg	0.01		0.0220 | 0.0303 | [NA]	0.0220 | 0.0366 | [NA] [14]	[NA]
Molybdenum	mg/kg	0.5		<0.50 | <0.50 | [NA]	<0.50 | 0.801 | [NA] [14]	[NA]
Nickel	mg/kg	0.5		2.43 | 2.34 | [NA]	2.43 | 2.01 | [NA]	[NA]
Selenium	mg/kg	0.2		<0.20 | <0.20 | [NA]	<0.20 | <0.20 | [NA]	[NA]
Silver	mg/kg	0.1		<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	[NA]
Vanadium	mg/kg	0.5		7.69 | 12.2 | 45.2 [15]	7.69 | 14.6 | 62.0 [15]	[NA]
Zinc	mg/kg	0.5		36.1 | 43.9 | 19.7	36.1 | 68.4 | 61.9 [15]	[NA]

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

Quality Control PGD0893

METALS-022|Acid Extractable Low Level Metals (Soil) | Batch BGD3791

Analyte	Units	PQL	Blank	DUP1 PGD0893-01 Samp | QC | RPD %	DUP2 PGD0893-01 Samp | QC | RPD %	LCS %	Spike % PGD0893-02
Aluminium	mg/kg	1.0	<1.0	20800 | 22000 | 5.45	20800 | 22200 | 6.25	80.6	##[2]
Antimony	mg/kg	0.50	<0.50	0.582 | 0.648 | [NA]	0.582 | 0.712 | [NA]	105	91.7
Arsenic	mg/kg	0.50	<0.50	15.0 | 17.5 | 15.0	15.0 | 15.4 | 2.67	99.4	93.1
Barium	mg/kg	0.50	<0.50	28.2 | 28.8 | 2.14	28.2 | 29.3 | 3.63	100	99.8
Beryllium	mg/kg	0.50	<0.50	0.861 | 0.875 | [NA]	0.861 | 0.894 | [NA]	95.7	90.3
Boron	mg/kg	2.0	<2.0	28.5 | 31.2 | 8.91	28.5 | 31.5 | 9.83	85.8	90.7
Cadmium	mg/kg	0.10	<0.10	0.193 | 0.212 | [NA]	0.193 | 0.202 | [NA]	101	97.8
Cobalt	mg/kg	0.50	<0.50	9.94 | 10.5 | 5.51	9.94 | 10.4 | 4.54	104	95.8
Copper	mg/kg	0.50	<0.50	55.1 | 56.8 | 2.99	55.1 | 59.1 | 6.97	97.6	98.2
Iron	mg/kg	1.0	<1.0	34600 | 37000 | 6.81	34600 | 36700 | 5.96	108	##[2]
Lead	mg/kg	0.50	<0.50	61.3 | 63.0 | 2.73	61.3 | 63.9 | 4.04	102	98.8
Manganese	mg/kg	0.50	<0.50	135 | 137 | 0.969	135 | 140 | 3.66	90.2	96.1
Mercury	mg/kg	0.010	<0.010	0.266 | 0.326 | 20.4	0.266 | 0.272 | 2.27	124	115
Molybdenum	mg/kg	0.50	<0.50	2.24 | 2.64 | [NA]	2.24 | 2.45 | [NA]	94.4	103
Nickel	mg/kg	0.50	<0.50	14.1 | 15.0 | 6.32	14.1 | 15.2 | 8.06	96.0	97.6
Selenium	mg/kg	0.20	<0.20	0.467 | 0.513 | [NA]	0.467 | 0.553 | [NA]	108	98.1
Silver	mg/kg	0.10	<0.10	0.334 | 0.342 | [NA]	0.334 | 0.350 | [NA]	97.3	94.9
Vanadium	mg/kg	0.50	<0.50	63.0 | 67.9 | 7.56	63.0 | 66.5 | 5.49	94.5	104
Zinc	mg/kg	0.50	<0.50	186 | 194 | 4.03	186 | 198 | 6.33	102	105

Analyte	Units	PQL	Blank	DUP3 PGD0893-11 Samp | QC | RPD %	DUP4 PGD0893-11 Samp | QC | RPD %	LCS %
Aluminium	mg/kg	1		37800 | 36800 | 2.60	37800 | 36800 | 2.52	[NA]
Antimony	mg/kg	0.5		<0.50 | <0.50 | [NA]	<0.50 | <0.50 | [NA]	[NA]
Arsenic	mg/kg	0.5		12.7 | 12.7 | 0.536	12.7 | 12.5 | 0.912	[NA]
Barium	mg/kg	0.5		27.4 | 26.8 | 2.11	27.4 | 27.0 | 1.52	[NA]
Beryllium	mg/kg	0.5		1.26 | 1.23 | [NA]	1.26 | 1.21 | [NA]	[NA]
Boron	mg/kg	2		69.4 | 70.0 | 0.889	69.4 | 69.6 | 0.284	[NA]
Cadmium	mg/kg	0.1		0.164 | 0.166 | [NA]	0.164 | 0.168 | [NA]	[NA]
Cobalt	mg/kg	0.5		14.8 | 14.4 | 2.50	14.8 | 14.4 | 3.12	[NA]
Copper	mg/kg	0.5		109 | 106 | 1.92	109 | 105 | 3.24	[NA]
Iron	mg/kg	1		42900 | 42400 | 1.07	42900 | 42100 | 1.72	[NA]
Lead	mg/kg	0.5		109 | 109 | 0.179	109 | 107 | 2.31	[NA]
Manganese	mg/kg	0.5		280 | 280 | 0.142	280 | 283 | 0.934	[NA]
Mercury	mg/kg	0.01		0.260 | 0.263 | 1.13	0.260 | 0.256 | 1.78	[NA]
Molybdenum	mg/kg	0.5		1.42 | 1.46 | [NA]	1.42 | 1.42 | [NA]	[NA]
Nickel	mg/kg	0.5		24.5 | 23.9 | 2.64	24.5 | 24.0 | 2.28	[NA]
Selenium	mg/kg	0.2		0.675 | 0.676 | [NA]	0.675 | 0.698 | [NA]	[NA]
Silver	mg/kg	0.1		0.434 | 0.398 | [NA]	0.434 | 0.430 | [NA]	[NA]
Vanadium	mg/kg	0.5		84.2 | 83.4 | 0.989	84.2 | 82.7 | 1.82	[NA]
Zinc	mg/kg	0.5		392 | 385 | 1.74	392 | 383 | 2.45	[NA]

METALS-021|Acid Extractable Low Level Metals (Water) | Batch BGD3388

Analyte	Units	PQL	Blank	DUP1 PGD0893-21 Samp | QC | RPD %	DUP2 BGD3388-DUP2# Samp | QC | RPD %	LCS %	Spike % PGD0893-23
Mercury	µg/L	0.050	<0.050	<0.050 | <0.050 | [NA]	<0.050 | <0.050 | [NA]	116	83.6

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

Quality Control PGD0893

METALS-022|Acid Extractable Low Level Metals (Water) | Batch BGD3389

Analyte	Units	PQL	Blank	DUP1 PGD0893-23 Samp | QC | RPD %	DUP2 BGD3389-DUP2# Samp | QC | RPD %	LCS %	Spike % BGD3389-MS1#
Aluminium	µg/L	10	<10	40.2 | 48.5 | [NA]	<10 | <10 | [NA]	105	93.7
Arsenic	µg/L	1.0	<1.0	2.80 | 3.08 | [NA]	<1.0 | <1.0 | [NA]	110	109
Barium	µg/L	1.0	<1.0	23.1 | 23.1 | 0.0865	102 | 102 | 0.0196	108	92.7
Beryllium	µg/L	0.50	<0.50	<1.0 | <1.0 | [NA]	<0.50 | <0.50 | [NA]	87.1	103
Boron	µg/L	20	<20	5060 | 5280 | 4.16	<20 | <20 | [NA]	101	96.0
Cadmium	µg/L	0.10	<0.10	<0.20 | <0.20 | [NA]	<0.10 | <0.10 | [NA]	107	108
Chromium	µg/L	1.0	<1.0	<2.0 | <2.0 | [NA]	<1.0 | <1.0 | [NA]	112	108
Cobalt	µg/L	1.0	<1.0	<2.0 | <2.0 | [NA]	<1.0 | <1.0 | [NA]	119	106
Copper	µg/L	1.0	<1.0	8.24 | 2.60 | [NA] [14]	4.59 | 4.29 | [NA]	117	102
Iron	µg/L	10	<10	78.3 | 80.2 | [NA]	149 | 147 | 1.19	112	84.2
Lead	µg/L	1.0	<1.0	<2.0 | <2.0 | [NA]	<1.0 | <1.0 | [NA]	105	94.8
Manganese	µg/L	1.0	<1.0	30.9 | 31.4 | 1.86	9.96 | 9.93 | 0.281	106	100
Molybdenum	µg/L	1.0	<1.0	15.0 | 15.2 | 1.19	<1.0 | <1.0 | [NA]	110	115
Nickel	µg/L	1.0	<1.0	<2.0 | <2.0 | [NA]	1.87 | 1.86 | [NA]	113	99.7
Selenium	µg/L	1.0	<1.0	<2.0 | <2.0 | [NA]	4.79 | 4.86 | [NA]	114	107
Silver	µg/L	1.0	<1.0	<2.0 | <2.0 | [NA]	<1.0 | <1.0 | [NA]	104	95.7
Vanadium	µg/L	1.0	<1.0	5.08 | 5.04 | [NA]	1.99 | 1.96 | [NA]	112	115
Zinc	µg/L	1.0	<1.0	11.6 | 10.9 | 6.42	13.9 | 13.7 | 1.49	115	96.2

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

METALS-022|Dissolved Low Level Metals (Water) | Batch BGD3381

Analyte	Units	PQL	Blank	DUP1 BGD3381-DUP1# Samp | QC | RPD %	DUP2 BGD3381-DUP2# Samp | QC | RPD %	LCS %	Spike % PGD0893-23
Chromium	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	1.90 | 1.94 | [NA]	104	108

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

Quality Control PGD0893

METALS-022_NEUT | NAGD Elutriate Metals - SW (Soil) | Batch BGD3859

Analyte	Units	PQL	Blank	DUP1 PGD0893-02 Samp | QC | RPD %	DUP2 PGD0893-02 Samp | QC | RPD %	LCS %	Spike % PGD0893-12
Aluminium	mg/L	0.010	<0.010	<0.020 | <0.020 | [NA]	<0.020 | <0.020 | [NA]	103	98.6
Antimony	mg/L	0.001		0.00248 | 0.00202 | [NA] [15]	0.00248 | <0.0020 | [NA] [15]	[NA]	94.4
Arsenic	mg/L	0.0010	<0.0010	0.00278 | 0.00246 | [NA]	0.00278 | 0.00278 | [NA]	105	97.6
Barium	mg/L	0.0010	<0.0010	0.0323 | 0.0278 | 14.9	0.0323 | 0.0285 | 12.6	101	80.3
Beryllium	mg/L	0.0005		<0.0010 | <0.0010 | [NA]	<0.0010 | <0.0010 | [NA]	[NA]	112
Boron	mg/L	0.02		5.41 | 5.46 | 0.880	5.41 | 5.58 | 2.97	[NA]	116
Cadmium	mg/L	0.00010	<0.00010	<0.00020 | <0.00020 | [NA]	<0.00020 | <0.00020 | [NA]	107	88.9
Chromium	mg/L	0.0010	<0.0010	<0.0020 | <0.0020 | [NA]	<0.0020 | <0.0020 | [NA]	106	99.9
Cobalt	mg/L	0.0010	<0.0010	<0.0020 | <0.0020 | [NA]	<0.0020 | <0.0020 | [NA]	107	95.3
Copper	mg/L	0.0010	<0.0010	<0.0020 | <0.0020 | [NA]	<0.0020 | <0.0020 | [NA]	109	88.7
Iron	mg/L	0.010	<0.010	<0.020 | <0.020 | [NA]	<0.020 | <0.020 | [NA]	103	92.4
Lead	mg/L	0.0010	<0.0010	<0.0020 | <0.0020 | [NA]	<0.0020 | <0.0020 | [NA]	108	86.8
Manganese	mg/L	0.0010	<0.0010	0.336 | 0.579 | 53.2 [15]	0.336 | 0.587 | 54.5 [15]	103	97.4
Molybdenum	mg/L	0.001		0.0211 | 0.0160 | 27.2 [15]	0.0211 | 0.0156 | 30.1 [15]	[NA]	99.7
Nickel	mg/L	0.0010	<0.0010	<0.0020 | <0.0020 | [NA]	<0.0020 | <0.0020 | [NA]	108	90.4
Selenium	mg/L	0.0010	<0.0010	<0.0020 | <0.0020 | [NA]	<0.0020 | <0.0020 | [NA]	105	87.6
Silver	mg/L	0.001		<0.0020 | <0.0020 | [NA]	<0.0020 | <0.0020 | [NA]	[NA]	90.6
Vanadium	mg/L	0.001		0.00548 | 0.00468 | [NA]	0.00548 | 0.00526 | [NA]	[NA]	107
Zinc	mg/L	0.0010	<0.0010	<0.0020 | <0.0020 | [NA]	<0.0020 | <0.0020 | [NA]	106	87.8

Analyte	Units	PQL	Blank	DUP3 PGD0893-03 Samp | QC | RPD %	DUP4 PGD0893-03 Samp | QC | RPD %	LCS %
Aluminium	mg/L	0.01		<0.020 | <0.020 | [NA]	<0.020 | <0.020 | [NA]	[NA]
Antimony	mg/L	0.001		<0.0020 | 0.00232 | [NA] [15]	<0.0020 | 0.00220 | [NA] [15]	[NA]
Arsenic	mg/L	0.001		0.00250 | 0.00216 | [NA]	0.00250 | 0.00218 | [NA]	[NA]
Barium	mg/L	0.001		0.0285 | 0.0255 | 11.3	0.0285 | 0.0252 | 12.4	[NA]
Beryllium	mg/L	0.0005		<0.0010 | <0.0010 | [NA]	<0.0010 | <0.0010 | [NA]	[NA]
Boron	mg/L	0.02		5.56 | 5.66 | 1.81	5.56 | 5.69 | 2.30	[NA]
Cadmium	mg/L	0.0001		<0.00020 | <0.00020 | [NA]	<0.00020 | <0.00020 | [NA]	[NA]
Chromium	mg/L	0.001		<0.0020 | <0.0020 | [NA]	<0.0020 | <0.0020 | [NA]	[NA]
Cobalt	mg/L	0.001		<0.0020 | <0.0020 | [NA]	<0.0020 | <0.0020 | [NA]	[NA]
Copper	mg/L	0.001		<0.0020 | <0.0020 | [NA]	<0.0020 | <0.0020 | [NA]	[NA]
Iron	mg/L	0.01		<0.020 | <0.020 | [NA]	<0.020 | <0.020 | [NA]	[NA]
Lead	mg/L	0.001		<0.0020 | <0.0020 | [NA]	<0.0020 | <0.0020 | [NA]	[NA]
Manganese	mg/L	0.001		0.580 | 0.694 | 17.9	0.580 | 0.725 | 22.3 [15]	[NA]
Molybdenum	mg/L	0.001		0.0160 | 0.0164 | 2.10	0.0160 | 0.0165 | 2.95	[NA]
Nickel	mg/L	0.001		<0.0020 | <0.0020 | [NA]	<0.0020 | <0.0020 | [NA]	[NA]
Selenium	mg/L	0.001		<0.0020 | <0.0020 | [NA]	<0.0020 | <0.0020 | [NA]	[NA]
Silver	mg/L	0.001		<0.0020 | <0.0020 | [NA]	<0.0020 | <0.0020 | [NA]	[NA]
Vanadium	mg/L	0.001		0.00526 | 0.00646 | [NA] [15]	0.00526 | 0.00676 | [NA] [15]	[NA]
Zinc	mg/L	0.001		<0.0020 | <0.0020 | [NA]	<0.0020 | <0.0020 | [NA]	[NA]

METALS-021_NEUT | NAGD Elutriate Metals - SW (Soil) | Batch BGD3860

Analyte	Units	PQL	Blank	DUP1 PGD0893-02 Samp | QC | RPD %	DUP2 PGD0893-02 Samp | QC | RPD %	LCS %	Spike % PGD0893-12
Mercury	mg/L	0.000050	<0.000050	<0.000050 | <0.000050 | [NA]	<0.000050 | <0.000050 | [NA]	80.0	76.0

Analyte	Units	PQL	Blank	DUP3 PGD0893-03 Samp | QC | RPD %	DUP4 PGD0893-03 Samp | QC | RPD %	LCS %
Mercury	mg/L	0.00005		<0.000050 | <0.000050 | [NA]	<0.000050 | <0.000050 | [NA]	[NA]

Quality Control PGD0893

METALS-020_1MHCL | Dilute Acid Extractable Bioavailable Metals (1M HCl) (Soil) | Batch BGE4254

Analyte	Units	PQL	Blank	DUP1 PGD0893-03 Samp | QC | RPD %	DUP2 PGD0893-11 Samp | QC | RPD %	LCS %
Copper	mg/kg	1.0	<1.0	11.4 | 17.9 | 44.8 [15]	46.2 | 42.4 | 8.39	92.0
Lead	mg/kg	1.0	<1.0	12.9 | 18.8 | 37.1	79.0 | 82.2 | 4.03	83.7
Mercury	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	41.2
Nickel	mg/kg	1.0	<1.0	<1.0 | 1.01 | [NA] [14]	2.63 | 2.49 | [NA]	86.7
Zinc	mg/kg	1.0	<1.0	39.8 | 58.5 | 37.9	280 | 292 | 4.14	82.1

Analyte	Units	PQL	Blank	DUP3 PGD0893-03 Samp | QC | RPD %	DUP4 PGD0893-11 Samp | QC | RPD %	LCS %
Copper	mg/kg	1		11.4 | 12.6 | 10.5	46.2 | 50.1 | 8.23	[NA]
Lead	mg/kg	1		12.9 | 16.3 | 23.3	79.0 | 84.2 | 6.35	[NA]
Mercury	mg/kg	0.1		<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	[NA]
Nickel	mg/kg	1		<1.0 | <1.0 | [NA]	2.63 | 2.80 | [NA]	[NA]
Zinc	mg/kg	1		39.8 | 49.8 | 22.3	280 | 299 | 6.48	[NA]

INORG-129 | Simultaneously Extractable Bioavailable Metals (SEM) & AVS (Soil) | Batch BGD4877

Analyte	Units	PQL	Blank	DUP1 PGD0893-01 Samp | QC | RPD %	DUP2 PGD0893-02 Samp | QC | RPD %	LCS %	Spike % PGD0893-03
Acid Volatile Sulfide (AVS)	µmole/g	0.50	<0.50	7.32 | 7.49 | 2.24	0.920 | 0.821 | [NA]	102	90.6

INORG-137 | Inorganics - Carbon, Nitrogen and Sulfur Species (Soil) | Batch BGD3117

Analyte	Units	PQL	Blank	DUP1 PGD0893-01 Samp | QC | RPD %	DUP2 PGD0893-11 Samp | QC | RPD %	LCS %
Total Organic Carbon	%	0.010	<0.010	2.43 | 2.50 | 2.88	3.59 | 3.55 | 1.04	[NA]

INORG-079 | Inorganics - Carbon, Nitrogen and Sulfur Species (Water) | Batch BGD3231

Analyte	Units	PQL	Blank	DUP1 BGD3231-DUP1# Samp | QC | RPD %	DUP2 BGD3231-DUP2# Samp | QC | RPD %	LCS %	Spike % BGD3231-MS1#
Total Organic Carbon	mg/L	1.0	<1.0	4290 | 4310 | 0.307	58.9 | 60.2 | 2.16	103	86.4

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-118 | Inorganics - Speciated Cr (III/VI) and Fe (II/III) (Water) | Batch BGD3430

Analyte	Units	PQL	Blank	DUP1 PGD0893-21 Samp | QC | RPD %	DUP2 BGD3430-DUP2# Samp | QC | RPD %	LCS %	Spike % BGD3430-MS1#
Hexavalent Chromium	mg/L	0.0050	<0.0050	<0.0050 | <0.0050 | [NA]	<0.0050 | <0.0050 | [NA]	102	100

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-118 | Inorganics - Speciated Cr (III/VI) and Fe (II/III) (Water) | Batch BGD3431

Analyte	Units	PQL	Blank	DUP1 PGD0893-21 Samp | QC | RPD %	LCS %	Spike % PGD0893-21
Hexavalent Chromium (Total)	mg/L	0.0050	<0.0050	<0.0050 | <0.0050 | [NA]	101	106

Quality Control PGD0893

INORG-057 | Inorganics - Nutrients (Water) | Batch BGD3183

Analyte	Units	PQL	Blank	DUP1 PGD0893-21 Samp | QC | RPD %	DUP2 BGD3183-DUP2# Samp | QC | RPD %	LCS %	Spike % PGD0893-23
Ammonia as N	mg/L	0.0050	<0.0050	<0.0050 | <0.0050 | [NA]	<0.0050 | <0.0050 | [NA]	108	94.5
Nitrate as N	mg/L	0.0050	<0.0050	<0.0050 | 0.00632 | [NA] [14]	1.76 | 1.79 | 1.71	109	99.0
Nitrate as NO3 by calculation	mg/L	0.020	<0.020			[NA]	[NA]
Nitrite as N	mg/L	0.0050	<0.0050	<0.0050 | <0.0050 | [NA]	<0.0050 | <0.0050 | [NA]	87.7	102
Nitrite as NO2 by calculation	mg/L	0.020	<0.020			[NA]	[NA]
NOx as N	mg/L	0.0050	<0.0050	<0.0050 | 0.00632 | [NA] [14]	1.76 | 1.79 | 1.71	109	99.0
Phosphate as P	mg/L	0.0050	<0.0050	<0.0050 | <0.0050 | [NA]	0.0216 | 0.0198 | [NA]	103	110

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-127 | Inorganics - Nutrients (Water) | Batch BGD3490

Analyte	Units	PQL	Blank	DUP1 BGD3490-DUP1# Samp | QC | RPD %	DUP2 BGD3490-DUP2# Samp | QC | RPD %	LCS %	Spike % BGD3490-MS1#
Total Nitrogen	mg/L	0.10	<0.10	6.07 | 6.15 | 1.27	5.06 | 4.90 | 3.33	110	77.4

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-118 | Inorganics - General Chemical Parameters (Soil) | Batch BGD3769

Analyte	Units	PQL	Blank	DUP1 PGD0893-01 Samp | QC | RPD %	DUP2 PGD0893-11 Samp | QC | RPD %	LCS %	Spike % PGD0893-02
Hexavalent Chromium	mg/kg	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	98.5	##[3]

INORG-118 | Inorganics - General Chemical Parameters (Soil) | Batch BGD3770

Analyte	Units	PQL	Blank	DUP1 PGD0893-22 Samp | QC | RPD %	LCS %	Spike % BGD3770-MS1#
Hexavalent Chromium	mg/kg	1.0	<1.0	<1.0 | <1.0 | [NA]	98.0	99.2

INORG-008 | Inorganics - Moisture (Soil) | Batch BGD3764

Analyte	Units	PQL	Blank	DUP1 PGD0893-01 Samp | QC | RPD %	DUP2 PGD0893-11 Samp | QC | RPD %	LCS %
Moisture	%	0.1		54.7 | 54.6 | 0.201	69.1 | 68.7 | 0.566	[NA]

INORG-008 | Inorganics - Moisture (Soil) | Batch BGD3765

Analyte	Units	PQL	Blank	DUP1 PGD0893-17 Samp | QC | RPD %	DUP2 BGD3765-DUP2# Samp | QC | RPD %	LCS %
Moisture	%	0.1		56.8 | 61.7 | 8.27	9.63 | 8.45 | 13.1	[NA]

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-055/062 | NAGD Elutriate Inorganics - SW (Soil) | Batch BGD4228

Analyte	Units	PQL	Blank	DUP1 PGD0893-02 Samp | QC | RPD %	DUP2 PGD0893-12 Samp | QC | RPD %	LCS %	Spike % PGD0893-03
Total Nitrogen	mg/L	0.50	<0.10	0.693 | 0.679 | 2.02	1.36 | 1.39 | 1.96	108	70.9

Quality Control PGD0893

INORG-060_TP|NAGD Elutriate Inorganics - SW (Soil) | Batch BGD4343

Analyte	Units	PQL	Blank	DUP1 PGD0893-02 Samp | QC | RPD %	DUP2 PGD0893-12 Samp | QC | RPD %	LCS %	Spike % PGD0893-03
Total Phosphorus	mg/L	0.010	<0.010	0.0551 | 0.0454 | 19.4	0.0455 | 0.0407 | [NA]	94.0	100

Analyte	Units	PQL	Blank	LCS %
Total Phosphorus	mg/L	0.010	<0.010	[NA]

INORG-057|NAGD Elutriate Inorganics - SW (Soil) | Batch BGD4349

Analyte	Units	PQL	Blank	DUP1 PGD0893-02 Samp | QC | RPD %	DUP2 PGD0893-12 Samp | QC | RPD %	LCS %	Spike % PGD0893-03
Ammonia as N	mg/L	0.0050	<0.0050	0.320 | 0.297 | 7.44	0.805 | 0.785 | 2.54	107	98.9
Nitrate as N	mg/L	0.0050	<0.0050	<0.0050 | <0.0050 | [NA]	<0.0050 | <0.0050 | [NA]	108	105
Nitrite as N	mg/L	0.0050	<0.0050	<0.0050 | <0.0050 | [NA]	<0.0050 | <0.0050 | [NA]	102	115
NOx as N	mg/L	0.025	<0.0050	<0.0050 | <0.0050 | [NA]	<0.0050 | <0.0050 | [NA]	108	105
Phosphate as P	mg/L	0.0050	<0.0050	0.0176 | 0.0153 | [NA]	<0.0050 | <0.0050 | [NA]	120	119

INORG-118|NAGD Elutriate Inorganics - SW (Soil) | Batch BGD4699

Analyte	Units	PQL	Blank	DUP1 PGD0893-01 Samp | QC | RPD %	DUP2 PGD0893-11 Samp | QC | RPD %	LCS %	Spike % PGD0893-02
Hexavalent Chromium	mg/L	0.0050	<0.0050	<0.050 | <0.050 | [NA] [1]	<0.050 | <0.050 | [NA] [1]	95.1	102

Quality Control PGD0893

ORG-029|PFAS Extended List (Soil) | Batch BGD4309

Analyte	Units	PQL	Blank	DUP1 PGD0893-01 Samp | QC | RPD %	DUP2 PGD0893-11 Samp | QC | RPD %	LCS %	Spike % PGD0893-02
Perfluorobutanesulfonic acid (PFBS)	µg/kg	0.10	<0.10	<0.200 | <0.10 | [NA] [10]	<0.300 | <0.10 | [NA] [10]	101	104
Perfluoropentanesulfonic acid (PFPeS)	µg/kg	0.10	<0.10	<0.200 | <0.10 | [NA] [10]	<0.300 | <0.10 | [NA] [10]	106	107
Perfluorohexanesulfonic acid (PFHxS)	µg/kg	0.10	<0.10	<0.200 | <0.10 | [NA] [10]	<0.300 | 0.109 | [NA] [10]	102	105
Perfluoroheptanesulfonic acid (PFHpS)	µg/kg	0.10	<0.10	<0.200 | <0.10 | [NA] [10]	<0.300 | <0.10 | [NA] [10]	105	108
Perfluorooctanesulfonic acid (PFOS)	µg/kg	0.10	<0.10	1.46 | 1.44 | 1.57 [10]	2.34 | 1.75 | 28.9 [10]	98.7	100
Perfluorodecanesulfonic acid (PFDS)	µg/kg	0.20	<0.20	<0.400 | <0.20 | [NA] [10]	<0.600 | <0.20 | [NA] [10]	103	101
Perfluorobutanoic acid (PFBA)	µg/kg	0.20	<0.20	<0.400 | <0.20 | [NA] [10]	<0.600 | <0.20 | [NA] [10]	98.1	98.9
Perfluoropentanoic acid (PFPeA)	µg/kg	0.20	<0.20	<0.400 | <0.20 | [NA] [10]	<0.600 | <0.20 | [NA] [10]	106	108
Perfluorohexanoic acid (PFHxA)	µg/kg	0.10	<0.10	<0.200 | <0.10 | [NA] [10]	<0.300 | <0.10 | [NA] [10]	101	95.5
Perfluoroheptanoic acid (PFHpA)	µg/kg	0.10	<0.10	<0.200 | <0.10 | [NA] [10]	<0.300 | <0.10 | [NA] [10]	98.6	101
Perfluorooctanoic acid (PFOA)	µg/kg	0.10	<0.10	<0.200 | <0.10 | [NA] [10]	<0.300 | <0.10 | [NA] [10]	99.8	100
Perfluorononanoic acid (PFNA)	µg/kg	0.10	<0.10	<0.200 | <0.10 | [NA] [10]	<0.300 | <0.10 | [NA] [10]	100	100
Perfluorodecanoic acid (PFDA)	µg/kg	0.50	<0.50	<1.00 | <0.50 | [NA] [10]	<1.50 | <0.50 | [NA] [10]	112	114
Perfluoroundecanoic acid (PFUnDA)	µg/kg	0.50	<0.50	<1.00 | <0.50 | [NA] [10]	<1.50 | <0.50 | [NA] [10]	107	110
Perfluorododecanoic acid (PFDoDA)	µg/kg	0.50	<0.50	<1.00 | <0.50 | [NA] [10]	<1.50 | <0.50 | [NA] [10]	94.0	96.5
Perfluorotridecanoic acid (PFTrDA)	µg/kg	0.50	<0.50	<1.00 | <0.50 | [NA] [10]	<1.50 | <0.50 | [NA] [10]	101	103
Perfluorotetradecanoic acid (PFTeDA)	µg/kg	5.0	<5.0	<10.0 | <5.0 | [NA] [10]	<15.0 | <5.0 | [NA] [10]	93.1	93.3
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/kg	0.10	<0.10	<0.200 | <0.10 | [NA] [10]	<0.300 | <0.10 | [NA] [10]	94.1	98.9
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/kg	0.10	<0.10	<0.200 | <0.10 | [NA] [10]	<0.300 | <0.10 | [NA] [10]	94.2	94.7
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/kg	0.20	<0.20	<0.400 | <0.20 | [NA] [10]	<0.600 | <0.20 | [NA] [10]	99.8	98.3
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/kg	0.20	<0.20	<0.400 | <0.20 | [NA] [10]	<0.600 | <0.20 | [NA] [10]	102	125
Perfluorooctane sulfonamide (FOSA)	µg/kg	1.0	<1.0	<2.00 | <1.0 | [NA] [10]	<3.00 | <1.0 | [NA] [10]	103	104
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/kg	1.0	<1.0	<2.00 | <1.0 | [NA] [10]	<3.00 | <1.0 | [NA] [10]	109	110
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/kg	1.0	<1.0	<2.00 | <1.0 | [NA] [10]	<3.00 | <1.0 | [NA] [10]	100	99.2
N-Methyl perfluorooctane sulfonamidoethanol	µg/kg	1.0	<1.0	<2.00 | <1.0 | [NA] [10]	<3.00 | <1.0 | [NA] [10]	109	105
N-Ethyl perfluorooctane sulfonamidoethanol	µg/kg	5.0	<5.0	<10.0 | <5.0 | [NA] [10]	<15.0 | <5.0 | [NA] [10]	102	103
N-Methyl perfluorooctane sulfonamidoacetic acid	µg/kg	0.20	<0.20	<0.400 | <0.20 | [NA] [10]	<0.600 | <0.20 | [NA] [10]	97.8	102
N-Ethyl perfluorooctane sulfonamidoacetic acid	µg/kg	0.20	<0.20	<0.400 | <0.20 | [NA] [10]	<0.600 | <0.20 | [NA] [10]	98.2	105
Surrogate 13C8 PFOS	%		*100*	*99.4 | 102*	*99.0 | 99.6*	*101*	*101*
Surrogate 13C2 PFOA	%		*101*	*98.9 | 93.0*	*101 | 98.5*	*97.6*	*96.4*
Extraction Internal Standard 13C3 PFBS	%		*97.9*	*77.8 | 78.6 | 0.997*	*74.4 | 75.0 | 0.883*	[NA]	[NA]
Extraction Internal Standard 18O2 PFHxS	%		*99.3*	*81.9 | 79.9 | 2.46*	*76.1 | 74.6 | 1.90*	[NA]	[NA]
Extraction Internal Standard 13C4 PFOS	%		*98.9*	*80.8 | 78.8 | 2.57*	*74.6 | 72.4 | 3.01*	[NA]	[NA]
Extraction Internal Standard 13C4 PFBA	%		*103*	*73.2 | 72.2 | 1.40*	*66.8 | 66.4 | 0.646*	[NA]	[NA]
Extraction Internal Standard 13C3 PFPeA	%		*100*	*75.6 | 75.1 | 0.571*	*70.6 | 70.6 | 0.0142*	[NA]	[NA]
Extraction Internal Standard 13C2 PFHxA	%		*97.2*	*83.2 | 79.0 | 5.16*	*71.1 | 74.0 | 3.91*	[NA]	[NA]
Extraction Internal Standard 13C4 PFHpA	%		*100*	*81.3 | 79.5 | 2.26*	*74.2 | 72.1 | 2.95*	[NA]	[NA]
Extraction Internal Standard 13C4 PFOA	%		*103*	*80.8 | 80.8 | 0.0247*	*75.2 | 75.0 | 0.280*	[NA]	[NA]
Extraction Internal Standard 13C5 PFNA	%		*101*	*82.4 | 79.8 | 3.17*	*75.6 | 76.8 | 1.63*	[NA]	[NA]
Extraction Internal Standard 13C2 PFDA	%		*95.2*	*83.3 | 81.7 | 2.00*	*75.5 | 78.9 | 4.40*	[NA]	[NA]
Extraction Internal Standard 13C2 PFUnDA	%		*105*	*78.9 | 74.0 | 6.45*	*78.3 | 80.4 | 2.55*	[NA]	[NA]
Extraction Internal Standard 13C2 PFDoDA	%		*95.7*	*85.0 | 82.3 | 3.23*	*76.7 | 80.9 | 5.27*	[NA]	[NA]
Extraction Internal Standard 13C2 PFTeDA	%		*110*	*91.6 | 92.2 | 0.620*	*88.4 | 86.1 | 2.65*	[NA]	[NA]
Extraction Internal Standard 13C2 4:2FTS	%		*103*	*49.2 | 50.0 | 1.47*	*45.6 | 47.0 | 3.02*	[NA]	[NA]
Extraction Internal Standard 13C2 6:2FTS	%		*109*	*59.8 | 59.8 | 0.0836*	*55.5 | 55.1 | 0.687*	[NA]	[NA]
Extraction Internal Standard 13C2 8:2FTS	%		*112*	*78.7 | 75.3 | 4.52*	*70.6 | 76.2 | 7.53*	[NA]	[NA]
Extraction Internal Standard 13C8 FOSA	%		*106*	*80.4 | 81.4 | 1.26*	*75.4 | 75.7 | 0.384*	[NA]	[NA]
Extraction Internal Standard d3 N MeFOSA	%		*103*	*76.1 | 79.5 | 4.33*	*73.9 | 72.8 | 1.53*	[NA]	[NA]
Extraction Internal Standard d5 N EtFOSA	%		*103*	*77.0 | 77.1 | 0.117*	*73.1 | 71.7 | 1.89*	[NA]	[NA]
Extraction Internal Standard d7 N MeFOSE	%		*93.4*	*79.8 | 78.0 | 2.33*	*72.1 | 67.9 | 5.91*	[NA]	[NA]
Extraction Internal Standard d9 N EtFOSE	%		*96.6*	*78.9 | 77.6 | 1.64*	*74.2 | 73.0 | 1.75*	[NA]	[NA]
Extraction Internal Standard d3 N MeFOSAA	%		*110*	*87.4 | 88.4 | 1.15*	*83.7 | 84.3 | 0.691*	[NA]	[NA]
Extraction Internal Standard d5 N EtFOSAA	%		*105*	*72.3 | 72.4 | 0.111*	*71.3 | 70.8 | 0.647*	[NA]	[NA]

Quality Control PGD0893

ORG-029|PFAS Extended List (Soil) | Batch BGD4309

Analyte	Units	PQL	Blank	DUP3 PGD0893-20 Samp | QC | RPD %	LCS %
Perfluorobutanesulfonic acid (PFBS)	µg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]	100
Perfluoropentanesulfonic acid (PFPeS)	µg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]	104
Perfluorohexanesulfonic acid (PFHxS)	µg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]	101
Perfluoroheptanesulfonic acid (PFHpS)	µg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]	105
Perfluorooctanesulfonic acid (PFOS)	µg/kg	0.10	<0.10	0.683 | 0.599 | 13.1	102
Perfluorodecanesulfonic acid (PFDS)	µg/kg	0.20	<0.20	<0.20 | <0.20 | [NA]	106
Perfluorobutanoic acid (PFBA)	µg/kg	0.20	<0.20	<0.20 | <0.20 | [NA]	97.7
Perfluoropentanoic acid (PFPeA)	µg/kg	0.20	<0.20	<0.20 | <0.20 | [NA]	107
Perfluorohexanoic acid (PFHxA)	µg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]	100
Perfluoroheptanoic acid (PFHpA)	µg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]	100
Perfluorooctanoic acid (PFOA)	µg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]	99.8
Perfluorononanoic acid (PFNA)	µg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]	101
Perfluorodecanoic acid (PFDA)	µg/kg	0.50	<0.50	<0.50 | <0.50 | [NA]	102
Perfluoroundecanoic acid (PFUnDA)	µg/kg	0.50	<0.50	<0.50 | <0.50 | [NA]	103
Perfluorododecanoic acid (PFDoDA)	µg/kg	0.50	<0.50	<0.50 | <0.50 | [NA]	98.4
Perfluorotridecanoic acid (PFTrDA)	µg/kg	0.50	<0.50	<0.50 | <0.50 | [NA]	97.3
Perfluorotetradecanoic acid (PFTeDA)	µg/kg	5.0	<5.0	<5.0 | <5.0 | [NA]	95.2
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]	99.3
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]	97.5
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/kg	0.20	<0.20	<0.20 | <0.20 | [NA]	98.3
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/kg	0.20	<0.20	<0.20 | <0.20 | [NA]	101
Perfluorooctane sulfonamide (FOSA)	µg/kg	1.0	<1.0	<1.0 | <1.0 | [NA]	101
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/kg	1.0	<1.0	<1.0 | <1.0 | [NA]	107
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/kg	1.0	<1.0	<1.0 | <1.0 | [NA]	102
N-Methyl perfluorooctane sulfonamidoethanol	µg/kg	1.0	<1.0	<1.0 | <1.0 | [NA]	107
N-Ethyl perfluorooctane sulfonamidoethanol	µg/kg	5.0	<5.0	<5.0 | <5.0 | [NA]	105
N-Methyl perfluorooctane sulfonamidoacetic acid	µg/kg	0.20	<0.20	<0.20 | <0.20 | [NA]	106
N-Ethyl perfluorooctane sulfonamidoacetic acid	µg/kg	0.20	<0.20	<0.20 | <0.20 | [NA]	103
Surrogate 13C8 PFOS	%		*99.4*	*95.4 | 99.5*	*103*
Surrogate 13C2 PFOA	%		*102*	*104 | 100*	*100*
Extraction Internal Standard 13C3 PFBS	%		*99.7*	*79.1 | 85.1 | 7.36*	*[NA]*
Extraction Internal Standard 18O2 PFHxS	%		*97.2*	*80.7 | 84.9 | 5.05*	*[NA]*
Extraction Internal Standard 13C4 PFOS	%		*98.6*	*83.8 | 85.6 | 2.10*	*[NA]*
Extraction Internal Standard 13C4 PFBA	%		*102*	*71.0 | 77.8 | 9.09*	*[NA]*
Extraction Internal Standard 13C3 PFPeA	%		*99.8*	*77.0 | 81.2 | 5.40*	*[NA]*
Extraction Internal Standard 13C2 PFHxA	%		*99.7*	*82.4 | 86.8 | 5.20*	*[NA]*
Extraction Internal Standard 13C4 PFHpA	%		*99.5*	*81.7 | 85.0 | 3.93*	*[NA]*
Extraction Internal Standard 13C4 PFOA	%		*101*	*79.1 | 87.2 | 9.83*	*[NA]*
Extraction Internal Standard 13C5 PFNA	%		*105*	*84.3 | 88.6 | 4.91*	*[NA]*
Extraction Internal Standard 13C2 PFDA	%		*101*	*82.4 | 92.3 | 11.2*	*[NA]*
Extraction Internal Standard 13C2 PFUnDA	%		*103*	*84.2 | 97.9 | 15.1*	*[NA]*
Extraction Internal Standard 13C2 PFDoDA	%		*109*	*93.2 | 98.7 | 5.71*	*[NA]*
Extraction Internal Standard 13C2 PFTeDA	%		*124*	*106 | 108 | 1.54*	*[NA]*
Extraction Internal Standard 13C2 4:2FTS	%		*103*	*64.3 | 68.0 | 5.55*	*[NA]*
Extraction Internal Standard 13C2 6:2FTS	%		*110*	*66.0 | 71.3 | 7.84*	*[NA]*
Extraction Internal Standard 13C2 8:2FTS	%		*117*	*77.5 | 85.5 | 9.87*	*[NA]*
Extraction Internal Standard 13C8 FOSA	%		*106*	*83.4 | 91.3 | 9.04*	*[NA]*
Extraction Internal Standard d3 N MeFOSA	%		*103*	*79.1 | 83.2 | 5.09*	*[NA]*
Extraction Internal Standard d5 N EtFOSA	%		*101*	*80.5 | 85.7 | 6.23*	*[NA]*
Extraction Internal Standard d7 N MeFOSE	%		*92.7*	*83.1 | 89.6 | 7.48*	*[NA]*
Extraction Internal Standard d9 N EtFOSE	%		*97.4*	*82.4 | 86.8 | 5.15*	*[NA]*
Extraction Internal Standard d3 N MeFOSAA	%		*120*	*100 | 106 | 5.39*	*[NA]*
Extraction Internal Standard d5 N EtFOSAA	%		*112*	*82.1 | 88.2 | 7.06*	*[NA]*

Quality Control PGD0893

ORG-029|PFAS Extended List (Water) | Batch BGD4724

Analyte	Units	PQL	Blank	LCS %
Perfluorobutanesulfonic acid (PFBS)	µg/L	0.010	<0.010	97.2
Perfluoropentanesulfonic acid (PFPeS)	µg/L	0.010	<0.010	89.7
Perfluorohexanesulfonic acid (PFHxS)	µg/L	0.010	<0.010	92.4
Perfluoroheptanesulfonic acid (PFHpS)	µg/L	0.010	<0.010	90.1
Perfluorooctanesulfonic acid (PFOS)	µg/L	0.010	<0.010	90.9
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.020	<0.020	88.8
Perfluorobutanoic acid (PFBA)	µg/L	0.020	<0.020	93.2
Perfluoropentanoic acid (PFPeA)	µg/L	0.020	<0.020	94.7
Perfluorohexanoic acid (PFHxA)	µg/L	0.010	<0.010	92.7
Perfluoroheptanoic acid (PFHpA)	µg/L	0.010	<0.010	89.9
Perfluorooctanoic acid (PFOA)	µg/L	0.010	<0.010	101
Perfluorononanoic acid (PFNA)	µg/L	0.010	<0.010	91.1
Perfluorodecanoic acid (PFDA)	µg/L	0.020	<0.020	103
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.020	<0.020	97.6
Perfluorododecanoic acid (PFDoDA)	µg/L	0.050	<0.050	96.6
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.10	<0.10	87.2
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.50	<0.50	97.2
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.010	<0.010	93.0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.010	<0.010	90.4
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.020	<0.020	93.3
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.020	<0.020	99.6
Perfluorooctane sulfonamide (FOSA)	µg/L	0.10	<0.10	97.4
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.050	<0.050	95.3
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.10	<0.10	87.9
N-Methyl perfluorooctane sulfonamidoethanol	µg/L	0.050	<0.050	87.9
N-Ethyl perfluorooctane sulfonamidoethanol	µg/L	0.50	<0.50	98.6
N-Methyl perfluorooctane sulfonamidoacetic acid	µg/L	0.020	<0.020	96.0
N-Ethyl perfluorooctane sulfonamidoacetic acid	µg/L	0.020	<0.020	90.2
Surrogate 13C8 PFOS	*%*		*99.6*	*92.7*
Surrogate 13C2 PFOA	*%*		*98.0*	*102*
Extraction Internal Standard 13C3 PFBS	*%*		*99.0*	*[NA]*
Extraction Internal Standard 18O2 PFHxS	*%*		*97.0*	*[NA]*
Extraction Internal Standard 13C4 PFOS	*%*		*96.4*	*[NA]*
Extraction Internal Standard 13C4 PFBA	*%*		*104*	*[NA]*
Extraction Internal Standard 13C3 PFPeA	*%*		*102*	*[NA]*
Extraction Internal Standard 13C2 PFHxA	*%*		*101*	*[NA]*
Extraction Internal Standard 13C4 PFHpA	*%*		*103*	*[NA]*
Extraction Internal Standard 13C4 PFOA	*%*		*105*	*[NA]*
Extraction Internal Standard 13C5 PFNA	*%*		*102*	*[NA]*
Extraction Internal Standard 13C2 PFDA	*%*		*93.5*	*[NA]*
Extraction Internal Standard 13C2 PFUnDA	*%*		*101*	*[NA]*
Extraction Internal Standard 13C2 PFDoDA	*%*		*99.2*	*[NA]*
Extraction Internal Standard 13C2 PFTeDA	*%*		*89.0*	*[NA]*
Extraction Internal Standard 13C2 4:2FTS	*%*		*102*	*[NA]*
Extraction Internal Standard 13C2 6:2FTS	*%*		*110*	*[NA]*
Extraction Internal Standard 13C2 8:2FTS	*%*		*115*	*[NA]*
Extraction Internal Standard 13C8 FOSA	*%*		*105*	*[NA]*
Extraction Internal Standard d3 N MeFOSA	*%*		*101*	*[NA]*
Extraction Internal Standard d5 N EtFOSA	*%*		*97.7*	*[NA]*
Extraction Internal Standard d7 N MeFOSE	*%*		*97.9*	*[NA]*
Extraction Internal Standard d9 N EtFOSE	*%*		*96.4*	*[NA]*
Extraction Internal Standard d3 N MeFOSAA	*%*		*115*	*[NA]*
Extraction Internal Standard d5 N EtFOSAA	*%*		*108*	*[NA]*

Quality Control PGD0893

ORG-029|NAGD Seawater Elutriate - PFAS Extended List - Trace Level (Soil) | Batch BGD5160

Analyte	Units	PQL	Blank	LCS %
Perfluorobutanesulfonic acid (PFBS)	µg/L	0.00040	<0.00040	98.6
Perfluoropentanesulfonic acid (PFPeS)	µg/L	0.0010	<0.0010	116
Perfluorohexanesulfonic acid (PFHxS)	µg/L	0.00020	<0.00020	113
Perfluoroheptanesulfonic acid (PFHpS)	µg/L	0.0010	<0.0010	101
Perfluorooctanesulfonic acid (PFOS)	µg/L	0.00020	<0.00020	111
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.0020	<0.0020	116
Perfluorobutanoic acid (PFBA)	µg/L	0.0020	<0.0020	110
Perfluoropentanoic acid (PFPeA)	µg/L	0.0020	<0.0020	117
Perfluorohexanoic acid (PFHxA)	µg/L	0.00040	<0.00040	110
Perfluoroheptanoic acid (PFHpA)	µg/L	0.00040	<0.00040	104
Perfluorooctanoic acid (PFOA)	µg/L	0.00020	<0.00020	96.8
Perfluorononanoic acid (PFNA)	µg/L	0.0010	<0.0010	117
Perfluorodecanoic acid (PFDA)	µg/L	0.0020	<0.0020	94.0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.0020	<0.0020	128
Perfluorododecanoic acid (PFDoDA)	µg/L	0.0050	<0.0050	115
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.010	<0.010	120
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.050	<0.050	102
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.0010	<0.0010	99.6
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.00040	<0.00040	112
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.00040	<0.00040	123
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.0020	<0.0020	128
Perfluorooctane sulfonamide (FOSA)	µg/L	0.010	<0.010	111
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.050	<0.050	102
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.10	<0.10	103
N-Methyl perfluorooctane sulfonamidoethanol	µg/L	0.050	<0.050	102
N-Ethyl perfluorooctane sulfonamidoethanol	µg/L	0.50	<0.50	101
N-Methyl perfluorooctane sulfonamidoacetic acid	µg/L	0.0020	<0.0020	114
N-Ethyl perfluorooctane sulfonamidoacetic acid	µg/L	0.0020	<0.0020	129
Surrogate 13C8 PFOS	%		*85.8*	*82.4*
Surrogate 13C2 PFOA	%		*101*	*112*
Extraction Internal Standard 13C3 PFBS	%		*73.0*	*[NA]*
Extraction Internal Standard 18O2 PFHxS	%		*72.0*	*[NA]*
Extraction Internal Standard 13C4 PFOS	%		*64.0*	*[NA]*
Extraction Internal Standard 13C4 PFBA	%		*89.0*	*[NA]*
Extraction Internal Standard 13C3 PFPeA	%		*76.0*	*[NA]*
Extraction Internal Standard 13C2 PFHxA	%		*81.0*	*[NA]*
Extraction Internal Standard 13C4 PFHpA	%		*88.0*	*[NA]*
Extraction Internal Standard 13C4 PFOA	%		*84.0*	*[NA]*
Extraction Internal Standard 13C5 PFNA	%		*71.0*	*[NA]*
Extraction Internal Standard 13C2 PFDA	%		*70.0*	*[NA]*
Extraction Internal Standard 13C2 PFUnDA	%		*75.0*	*[NA]*
Extraction Internal Standard 13C2 PFDoDA	%		*72.0*	*[NA]*
Extraction Internal Standard 13C2 PFTeDA	%		*55.0*	*[NA]*
Extraction Internal Standard 13C2 4:2FTS	%		*130*	*[NA]*
Extraction Internal Standard 13C2 6:2FTS	%		*102*	*[NA]*
Extraction Internal Standard 13C2 8:2FTS	%		*113*	*[NA]*
Extraction Internal Standard 13C8 FOSA	%		*72.0*	*[NA]*
Extraction Internal Standard d3 N MeFOSA	%		*99.0*	*[NA]*
Extraction Internal Standard d5 N EtFOSA	%		*99.0*	*[NA]*
Extraction Internal Standard d7 N MeFOSE	%		*105*	*[NA]*
Extraction Internal Standard d9 N EtFOSE	%		*105*	*[NA]*
Extraction Internal Standard d3 N MeFOSAA	%		*85.0*	*[NA]*
Extraction Internal Standard d5 N EtFOSAA	%		*90.0*	*[NA]*

Quality Control PGD0893

INORG-068|Chromium Reducible Sulfur Suite (Soil) | Batch BGD3118

Analyte	Units	PQL	Blank	DUP1 PGD0893-01 Samp | QC | RPD %	DUP2 PGD0893-11 Samp | QC | RPD %	LCS %
pH KCl	pH units		NT	8.44 | 8.44 | 0.00	8.15 | 8.16 | 0.123	94.3
TAA	moles H+/t	5.0	<5.0	<5.0 | <5.0 | [NA]	<5.0 | <5.0 | [NA]	99.6
s-TAA	% w/w S	0.010	<0.010	<0.010 | <0.010 | [NA]	<0.010 | <0.010 | [NA]	[NA]
Chromium Reducible Sulfur	% w/w	0.0050	<0.0050	0.400 | 0.402 | 0.327	0.565 | 0.568 | 0.529	101
a-Chromium Reducible Sulfur	moles H+/t	3.0	<3.0	250 | 250 | 0.328	353 | 354 | 0.529	[NA]
SHCl	% w/w S	0.0050	<0.0050	NT | NT | [NA]	NT | NT | [NA]	[NA]
SKCl	% w/w S	0.0050	<0.0050	NT | NT | [NA]	NT | NT | [NA]	[NA]
SNAS	% w/w S	0.0050	<0.0050	NT | NT | [NA]	NT | NT | [NA]	[NA]
a-SNAS	moles H+/t	5.0	<5.0	NT | NT | [NA]	NT | NT | [NA]	[NA]
s-SNAS	% w/w S	0.010	<0.010	NT | NT | [NA]	NT | NT | [NA]	[NA]
Fineness Factor	-	1.5	NT	1.50 | 1.50 | [NA]	1.50 | 1.50 | [NA]	[NA]
ANCBT	% CaCO3	0.010	<0.010	13.9 | 13.9 | 0.0360	2.81 | 2.83 | 0.532	NT
a-ANCBT	moles H+/t	5.0	<5.0	2780 | 2770 | 0.0360	562 | 565 | 0.532	[NA]
s-ANCBT	% w/w S	0.010	<0.010	4.45 | 4.45 | 0.0360	0.901 | 0.906 | 0.532	[NA]
s-Net Acidity	% w/w S	0.0050	<0.0050	<0.0050 | <0.0050 | [NA]	<0.0050 | <0.0050 | [NA]	[NA]
a-Net Acidity	moles H+/t	5.0	<5.0	<5.0 | <5.0 | [NA]	<5.0 | <5.0 | [NA]	[NA]
Liming rate	kg CaCO3/t	0.75	<0.75	<0.75 | <0.75 | [NA]	<0.75 | <0.75 | [NA]	[NA]
s-Net Acidity without ANCE	% w/w S	0.0050	<0.0050	0.400 | 0.402 | 0.327	0.565 | 0.568 | 0.529	[NA]
a-Net Acidity without ANCE	moles H+/t	5.0	<5.0	250 | 250 | 0.328	353 | 354 | 0.529	[NA]
Liming rate without ANCE	kg CaCO3/t	0.75	<0.75	18.7 | 18.8 | 0.328	26.5 | 26.6 | 0.529	[NA]

ORG-025_TBT_TCLP|NAGD Elutriate Organometallics - SW (Soil) | Batch BGD3945

Analyte	Units	PQL	Blank	DUP1 PGD0893-03 Samp | QC | RPD %	DUP2 PGD0893-12 Samp | QC | RPD %	LCS %	Spike % PGD0893-04
Monobutyltin	µg/L	0.05		<0.050 | <0.050 | [NA]	<0.050 | <0.050 | [NA]	[NA]	[NA]
Monobutyltin as Sn	µg/L	0.050	<0.050	<0.050 | <0.050 | [NA]	<0.050 | <0.050 | [NA]	[NA]	[NA]
Dibutyltin	µg/L	0.01		<0.010 | <0.010 | [NA]	<0.010 | <0.010 | [NA]	113	103
Dibutyltin as Sn	µg/L	0.010	<0.010	<0.010 | <0.010 | [NA]	<0.010 | <0.010 | [NA]	[NA]	[NA]
Tributyltin	µg/L	0.01		<0.010 | <0.010 | [NA]	<0.010 | <0.010 | [NA]	111	103
Tributyltin as Sn	µg/L	0.010	<0.010	<0.010 | <0.010 | [NA]	<0.010 | <0.010 | [NA]	[NA]	[NA]
Surrogate Triphenyltin	*%*		*99.9*	*99.2 | 99.7*	*100 | 99.0*	*98.9*	*100*

QC Comments

Identifier	Description
[1]	Matrix interference - sample contained elevated chloride levels.
[2]	Spike recovery is not applicable due to the relatively high analyte background in the sample (>3* spike level). However, the LCS recovery is within acceptance criteria.
[3]	Spike recovery is outside routine acceptance criteria (70-130%), this may be due to suspected non-homogeneity and/or matrix interference effects. However, an acceptable recovery was achieved for the LCS.
[4]	Spike recovery is outside routine acceptance criteria (60-140%), this may be due to suspected non-homogeneity and/or matrix interference effects. However, an acceptable recovery was achieved for the LCS.
[5]	Spike recovery is outside routine acceptance criteria (60-140%). Where recoveries of <20% and >200% are attributable to matrix interference effects, there will be a high uncertainty associated with the parent result.
[6]	Surrogate recovery is outside routine acceptance criteria (60-140%) as a result of the high concentration of analyte(s) in the sample.
[7]	Surrogate recovery was outside routine acceptance criteria (60-140%) due to sample matrix effects. This may be due to the presence of carbon and/or other artefacts. An acceptable recovery was achieved for the LCS surrogates.
[8]	DDT can break down to DDD and DDE during analysis due to sample matrix. The DDT breakdown exceeded the recommended breakdown criteria of 20% after running the samples, therefore levels of DDE, DDD, DDT may be slightly elevated or underestimated.
[10]	PQL(s) has/have been raised due to the high moisture content in the sample, resulting in a higher effective dilution factor.
[12]	PQL(s) has/have been raised due to matrix interference.
[13]	PQL has been raised due to matrix requiring dilution
[14]	Duplicate %RPD may be flagged as an outlier to routine laboratory acceptance, however, where one or both results are <10*PQL, the RPD acceptance criteria increases exponentially.
[15]	The laboratory duplicate RPD acceptance criteria has been exceeded. Sample heterogeneity suspected. 3 sets of data have been provided to help demonstrate the degree of non-homogeneity within the sample as well as assessing the analytical precision.
[16]	The laboratory duplicate RPD acceptance criteria has been exceeded. Results are accepted due to the inhomogeneous nature of the sample.

B.2 MAFRL Laboratory Reports

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: Sophie Cochrane
Customer: BMT
Address: Level 4, 20 Parkland Road, Osborne Park 6017

Date of Issue: 30/04/2025
Date Received: 10/04/2025
Our Reference: BMT25-17

Sample Name:	AP1
Sampling Date:	10/04/2025
Sample Type:	Sediment
MAFRL Job Code:	BMT25-17
Client Reference:	003555.000_004
Analysis Date:	29/04/2025
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**2.12**
Very Fine Silt % (4-8µm)	1.90
Fine Silt % (8-16µm)	2.18
Medium Silt % (16-31µm)	1.27
Course Silt % (31-63µm)	0.87
Total Silt (4-63µm)	**6.22**
Very Fine sand % (63-125µm)	0.27
Fine sand % (125-250µm)	7.57
Medium sand % (250-500µm)	55.48
Coarse sand % (500-1000µm)	26.38
Very Coarse sand % (1000-2000µm)	0.72
Total Sand (63-2000µm)	**90.42**
Total Gravels (>2000µm)	**1.25**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	26.38
1000	0.72
2000	0.34
4000	0.52
8000	0.39
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)	397.83
Minimum settling velocity of 50% of particles (mm s^1)	130.51
Time for 50% of particles to settle over 1 m (hours)	0.002
D10 (µm)	193.89
Minimum settling velocity of 90% of particles (mm s^1)	31.00
Time for 90% of particles to settle over 1 m (hours)	0.009

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, plant material and shell present.

Signatory: Jamie Woodward
Date: 30/04/2025

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.

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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: Sophie Cochrane
Customer: BMT
Address: Level 4, 20 Parkland Road, Osborne Park 6017

Date of Issue: 30/04/2025
Date Received: 10/04/2025
Our Reference: BMT25-17

Sample Name:	AP2
Sampling Date:	10/04/2025
Sample Type:	Sediment
MAFRL Job Code:	BMT25-17
Client Reference:	003555.000_004
Analysis Date:	29/04/2025
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**12.58**
Very Fine Silt % (4-8µm)	12.27
Fine Silt % (8-16µm)	15.47
Medium Silt % (16-31µm)	14.68
Course Silt % (31-63µm)	11.35
Total Silt (4-63µm)	**53.77**
Very Fine sand % (63-125µm)	7.54
Fine sand % (125-250µm)	5.32
Medium sand % (250-500µm)	2.68
Coarse sand % (500-1000µm)	2.42
Very Coarse sand % (1000-2000µm)	1.97
Total Sand (63-2000µm)	**19.93**
Total Gravels (>2000µm)	**13.72**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	2.42
1000	1.97
2000	5.96
4000	7.76
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)	24.48
Minimum settling velocity of 50% of particles (mm s^1)	0.49
Time for 50% of particles to settle over 1 m (hours)	0.562
D10 (µm)	3.30
Minimum settling velocity of 90% of particles (mm s^1)	0.01
Time for 90% of particles to settle over 1 m (hours)	30.850

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: 30/04/2025

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: Sophie Cochrane
Customer: BMT
Address: Level 4, 20 Parkland Road, Osborne Park 6017

Date of Issue: 30/04/2025
Date Received: 10/04/2025
Our Reference: BMT25-17

Sample Name:	AP3
Sampling Date:	10/04/2025
Sample Type:	Sediment
MAFRL Job Code:	BMT25-17
Client Reference:	003555.000_004
Analysis Date:	29/04/2025
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**5.86**
Very Fine Silt % (4-8µm)	4.73
Fine Silt % (8-16µm)	4.68
Medium Silt % (16-31µm)	3.09
Course Silt % (31-63µm)	2.65
Total Silt (4-63µm)	**15.15**
Very Fine sand % (63-125µm)	2.33
Fine sand % (125-250µm)	13.51
Medium sand % (250-500µm)	32.05
Coarse sand % (500-1000µm)	25.41
Very Coarse sand % (1000-2000µm)	1.52
Total Sand (63-2000µm)	**74.82**
Total Gravels (>2000µm)	**4.16**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	25.41
1000	1.52
2000	0.94
4000	0.86
8000	2.36
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)	332.23
Minimum settling velocity of 50% of particles (mm s^1)	91.02
Time for 50% of particles to settle over 1 m (hours)	0.003
D10 (µm)	7.37
Minimum settling velocity of 90% of particles (mm s^1)	0.04
Time for 90% of particles to settle over 1 m (hours)	6.199

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
Muddy sand with some plant material and shell present.

Signatory: Jamie Woodward
Date: 30/04/2025

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

Accreditation Number: 10603
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Murdoch University

PARTICLE SIZE ANALYSIS REPORT

Contact: Sophie Cochrane
Customer: BMT
Address: Level 4, 20 Parkland Road, Osborne Park 6017

Date of Issue: 30/04/2025
Date Received: 10/04/2025
Our Reference: BMT25-17

Sample Name:	EQ1
Sampling Date:	10/04/2025
Sample Type:	Sediment
MAFRL Job Code:	BMT25-17
Client Reference:	003555.000_004
Analysis Date:	24/04/2025
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**20.15**
Very Fine Silt % (4-8µm)	14.79
Fine Silt % (8-16µm)	16.54
Medium Silt % (16-31µm)	17.09
Course Silt % (31-63µm)	16.93
Total Silt (4-63µm)	**65.35**
Very Fine sand % (63-125µm)	9.45
Fine sand % (125-250µm)	3.05
Medium sand % (250-500µm)	1.33
Coarse sand % (500-1000µm)	0.54
Very Coarse sand % (1000-2000µm)	0.11
Total Sand (63-2000µm)	**14.47**
Total Gravels (>2000µm)	**0.02**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	0.54
1000	0.11
2000	0.02
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)	15.09
Minimum settling velocity of 50% of particles (mm s^1)	0.19
Time for 50% of particles to settle over 1 m (hours)	1.479
D10 (µm)	2.15
Minimum settling velocity of 90% of particles (mm s^1)	0.00
Time for 90% of particles to settle over 1 m (hours)	72.764

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: 30/04/2025

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Marine and Freshwater Research Laboratory
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PARTICLE SIZE ANALYSIS REPORT

Contact: Sophie Cochrane
Customer: BMT
Address: Level 4, 20 Parkland Road, Osborne Park 6017

Date of Issue: 30/04/2025
Date Received: 10/04/2025
Our Reference: BMT25-17

Sample Name:	EQ2_1
Sampling Date:	10/04/2025
Sample Type:	Sediment
MAFRL Job Code:	BMT25-17
Client Reference:	003555.000_004
Analysis Date:	24/04/2025
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**9.65**
Very Fine Silt % (4-8µm)	7.12
Fine Silt % (8-16µm)	7.71
Medium Silt % (16-31µm)	8.16
Course Silt % (31-63µm)	10.66
Total Silt (4-63µm)	**33.65**
Very Fine sand % (63-125µm)	15.98
Fine sand % (125-250µm)	23.29
Medium sand % (250-500µm)	11.97
Coarse sand % (500-1000µm)	3.89
Very Coarse sand % (1000-2000µm)	0.85
Total Sand (63-2000µm)	**55.99**
Total Gravels (>2000µm)	**0.72**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	3.89
1000	0.85
2000	0.72
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)	88.20
Minimum settling velocity of 50% of particles (mm s^1)	6.41
Time for 50% of particles to settle over 1 m (hours)	0.043
D10 (µm)	4.16
Minimum settling velocity of 90% of particles (mm s^1)	0.01
Time for 90% of particles to settle over 1 m (hours)	19.510

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, shell and rock present.

Signatory: Jamie Woodward
Date: 30/04/2025

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PARTICLE SIZE ANALYSIS REPORT

Contact: Sophie Cochrane
Customer: BMT
Address: Level 4, 20 Parkland Road, Osborne Park 6017

Date of Issue: 30/04/2025
Date Received: 10/04/2025
Our Reference: BMT25-17

Sample Name:	EQ2_2
Sampling Date:	10/04/2025
Sample Type:	Sediment
MAFRL Job Code:	BMT25-17
Client Reference:	003555.000_004
Analysis Date:	24/04/2025
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**8.57**
Very Fine Silt % (4-8µm)	6.23
Fine Silt % (8-16µm)	6.63
Medium Silt % (16-31µm)	6.96
Course Silt % (31-63µm)	9.07
Total Silt (4-63µm)	**28.88**
Very Fine sand % (63-125µm)	14.97
Fine sand % (125-250µm)	24.49
Medium sand % (250-500µm)	14.26
Coarse sand % (500-1000µm)	5.79
Very Coarse sand % (1000-2000µm)	1.46
Total Sand (63-2000µm)	**60.98**
Total Gravels (>2000µm)	**1.57**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	5.79
1000	1.46
2000	1.57
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)	115.14
Minimum settling velocity of 50% of particles (mm s^1)	10.93
Time for 50% of particles to settle over 1 m (hours)	0.025
D10 (µm)	4.73
Minimum settling velocity of 90% of particles (mm s^1)	0.02
Time for 90% of particles to settle over 1 m (hours)	15.027

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, shell and rock present.

Signatory: Jamie Woodward
Date: 30/04/2025

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PARTICLE SIZE ANALYSIS REPORT

Contact: Sophie Cochrane
Customer: BMT
Address: Level 4, 20 Parkland Road, Osborne Park 6017

Date of Issue: 30/04/2025
Date Received: 10/04/2025
Our Reference: BMT25-17

Sample Name:	EQ2_3
Sampling Date:	10/04/2025
Sample Type:	Sediment
MAFRL Job Code:	BMT25-17
Client Reference:	003555.000_004
Analysis Date:	24/04/2025
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**6.93**
Very Fine Silt % (4-8µm)	5.08
Fine Silt % (8-16µm)	5.14
Medium Silt % (16-31µm)	4.77
Course Silt % (31-63µm)	5.17
Total Silt (4-63µm)	**20.15**
Very Fine sand % (63-125µm)	7.98
Fine sand % (125-250µm)	16.97
Medium sand % (250-500µm)	12.75
Coarse sand % (500-1000µm)	8.32
Very Coarse sand % (1000-2000µm)	2.63
Total Sand (63-2000µm)	**48.65**
Total Gravels (>2000µm)	**24.26**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	8.32
1000	2.63
2000	3.12
4000	0.45
8000	20.69
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)	232.31
Minimum settling velocity of 50% of particles (mm s^1)	44.50
Time for 50% of particles to settle over 1 m (hours)	0.006
D10 (µm)	6.13
Minimum settling velocity of 90% of particles (mm s^1)	0.03
Time for 90% of particles to settle over 1 m (hours)	8.973

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: 30/04/2025

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PARTICLE SIZE ANALYSIS REPORT

Contact: Sophie Cochrane
Customer: BMT
Address: Level 4, 20 Parkland Road, Osborne Park 6017

Date of Issue: 30/04/2025
Date Received: 10/04/2025
Our Reference: BMT25-17

Sample Name:	EQ3
Sampling Date:	10/04/2025
Sample Type:	Sediment
MAFRL Job Code:	BMT25-17
Client Reference:	003555.000_004
Analysis Date:	24/04/2025
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**11.79**
Very Fine Silt % (4-8µm)	8.86
Fine Silt % (8-16µm)	9.43
Medium Silt % (16-31µm)	9.46
Course Silt % (31-63µm)	12.34
Total Silt (4-63µm)	**40.08**
Very Fine sand % (63-125µm)	17.12
Fine sand % (125-250µm)	20.26
Medium sand % (250-500µm)	7.06
Coarse sand % (500-1000µm)	2.03
Very Coarse sand % (1000-2000µm)	0.54
Total Sand (63-2000µm)	**47.01**
Total Gravels (>2000µm)	**1.11**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	2.03
1000	0.54
2000	0.48
4000	0.63
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)	57.35
Minimum settling velocity of 50% of particles (mm s^1)	2.71
Time for 50% of particles to settle over 1 m (hours)	0.102
D10 (µm)	3.42
Minimum settling velocity of 90% of particles (mm s^1)	0.01
Time for 90% of particles to settle over 1 m (hours)	28.866

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, shell and rock present.

Signatory: Jamie Woodward
Date: 30/04/2025

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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
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PARTICLE SIZE ANALYSIS REPORT

Contact: Sophie Cochrane
Customer: BMT
Address: Level 4, 20 Parkland Road, Osborne Park 6017

Date of Issue: 30/04/2025
Date Received: 10/04/2025
Our Reference: BMT25-17

Sample Name:	MB4
Sampling Date:	10/04/2025
Sample Type:	Sediment
MAFRL Job Code:	BMT25-17
Client Reference:	003555.00_004
Analysis Date:	28/04/2025
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**4.96**
Very Fine Silt % (4-8µm)	4.29
Fine Silt % (8-16µm)	4.51
Medium Silt % (16-31µm)	2.71
Course Silt % (31-63µm)	2.31
Total Silt (4-63µm)	**13.83**
Very Fine sand % (63-125µm)	0.82
Fine sand % (125-250µm)	20.81
Medium sand % (250-500µm)	55.01
Coarse sand % (500-1000µm)	2.77
Very Coarse sand % (1000-2000µm)	0.21
Total Sand (63-2000µm)	**79.62**
Total Gravels (>2000µm)	**1.59**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	2.77
1000	0.21
2000	0.34
4000	1.19
8000	0.05
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)	283.53
Minimum settling velocity of 50% of particles (mm s^1)	66.29
Time for 50% of particles to settle over 1 m (hours)	0.004
D10 (µm)	8.92
Minimum settling velocity of 90% of particles (mm s^1)	0.07
Time for 90% of particles to settle over 1 m (hours)	4.232

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
Muddy sand with some shell and plant material present.

Signatory: Jamie Woodward
Date: 30/04/2025

The results only apply to the sample as received and to the sample tested.
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Marine and Freshwater Research Laboratory
Tel: 08 93602907 Address: 90 South St, Murdoch, WA, 6150

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PARTICLE SIZE ANALYSIS REPORT

Contact: Sophie Cochrane
Customer: BMT
Address: Level 4, 20 Parkland Road, Osborne Park 6017

Date of Issue: 30/04/2025
Date Received: 10/04/2025
Our Reference: BMT25-17

Sample Name:	MB5
Sampling Date:	10/04/2025
Sample Type:	Sediment
MAFRL Job Code:	BMT25-17
Client Reference:	003555.000_004
Analysis Date:	28/04/2025
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**27.61**
Very Fine Silt % (4-8µm)	20.13
Fine Silt % (8-16µm)	19.45
Medium Silt % (16-31µm)	12.48
Course Silt % (31-63µm)	6.64
Total Silt (4-63µm)	**58.70**
Very Fine sand % (63-125µm)	3.28
Fine sand % (125-250µm)	1.25
Medium sand % (250-500µm)	0.39
Coarse sand % (500-1000µm)	0.33
Very Coarse sand % (1000-2000µm)	0.06
Total Sand (63-2000µm)	**5.31**
Total Gravels (>2000µm)	**8.39**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	0.33
1000	0.06
2000	0.12
4000	8.27
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)	8.64
Minimum settling velocity of 50% of particles (mm s^1)	0.06
Time for 50% of particles to settle over 1 m (hours)	4.517
D10 (µm)	1.66
Minimum settling velocity of 90% of particles (mm s^1)	0.00
Time for 90% of particles to settle over 1 m (hours)	121.810

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: 30/04/2025

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.

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PARTICLE SIZE ANALYSIS REPORT

Contact: Sophie Cochrane
Customer: BMT
Address: Level 4, 20 Parkland Road, Osborne Park 6017

Date of Issue: 30/04/2025
Date Received: 10/04/2025
Our Reference: BMT25-17

Sample Name:	MB6
Sampling Date:	10/04/2025
Sample Type:	Sediment
MAFRL Job Code:	BMT25-17
Client Reference:	003555.000_004
Analysis Date:	28/04/2025
Method Number:	9400

Wentworth Size Classifications	
Total Clay % (0-4µm)	**5.96**
Very Fine Silt % (4-8µm)	4.38
Fine Silt % (8-16µm)	4.05
Medium Silt % (16-31µm)	2.34
Course Silt % (31-63µm)	1.87
Total Silt (4-63µm)	**12.64**
Very Fine sand % (63-125µm)	0.46
Fine sand % (125-250µm)	21.61
Medium sand % (250-500µm)	55.37
Coarse sand % (500-1000µm)	2.80
Very Coarse sand % (1000-2000µm)	0.29
Total Sand (63-2000µm)	**80.54**
Total Gravels (>2000µm)	**0.86**

Extended range by sieving

Extended size, µm	Extended percent retained at size
500	2.80
1000	0.29
2000	0.35
4000	0.51
8000	0.00
16000	0.00

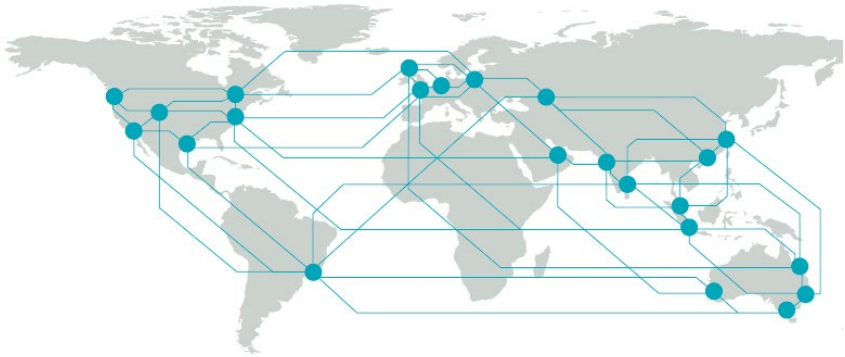
Settling Velocity calculations using Stokes Law	
Parameters	
Particle density (ρp)(g/cm^3)	2.65
Liquid density (ρf) (g/cm^3)	1.025
Acceleration due to Gravity (g) (ms^{-2})	9.81
Liquid viscosity (η) (cp)	1.074
*Liquid parameters based on seawater of 35ppt @ 20°C	
Calculations	
D50 (µm)	280.97
Minimum settling velocity of 50% of particles (mm s^1)	65.10
Time for 50% of particles to settle over 1 m (hours)	0.004
D10 (µm)	7.60
Minimum settling velocity of 90% of particles (mm s^1)	0.05
Time for 90% of particles to settle over 1 m (hours)	5.833

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
Muddy sand with some plant material and shell present.

Signatory: Jamie Woodward
Date: 30/04/2025

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.



BMT is a leading design, engineering, science and management consultancy with a reputation for engineering excellence. We are driven by a belief that things can always be better, safer, faster and more efficient. BMT is an independent organisation held in trust for its employees.

Level 2
150 St Georges Tce
Perth
WA 6000
Australia
+61 8 6163 4900

Registered in Australia
Registered no. 010 830 421
Registered office
Level 5, 348 Edward Street,
Brisbane QLD 4000 Australia

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