Douglas PARTNERS

GROUNDED EXPERTISE

Report on Detailed site investigation (contamination)

Proposed Battery Energy Storage System (BESS)

103 Cabbage Tree Road, Williamtown NSW

Prepared for Hive Battery Developments Pty Ltd

Project 226269.01

17 May 2024

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Executive Summary

Douglas Partners Pty Ltd (Douglas) has prepared this detailed site investigation for contamination (DSI) for a proposed battery energy storage system (BESS) at 103 Cabbage Tree Road, Williamtown NSW (the site).

It is understood that the proposed development comprises construction of a fill platform to support the proposed battery energy storage system (BESS), construction of BESS, temporary excavation for a service trench and construction of a driveway from Cabbage Tree Road to the BESS.

The objective of the DSI is to assess the suitability of the site for the proposed development and whether further investigation and/or remediation / management is required. It is understood that the report will be used to support a development application for the proposed development.

The current investigation included review of the preliminary site investigation (PSI), preparation of a brief sampling quality and analysis plan (SAQP), drilling boreholes using hand auger and installation of groundwater monitoring wells in the boreholes, excavation of test pits, collection of soil samples from pits and groundwater samples from wells, laboratory analysis of selected soil and groundwater samples and preparation of this DSI report. The findings of the DSI are summarised as follows:

Soil: Laboratory analysis of selected soil samples collected for this assessment indicated contaminant concentrations were generally below the site assessment criteria (SAC) for industrial land use.

Asbestos was not detected in laboratory analysis completed to date, however, building materials such as tile, brick, concrete, ceramics were observed in below-ground fill and this is considered an indication of hazardous building materials (HBM) such as asbestos. Fibro sheeting materials were also identified adjacent to the site in (Douglas, 2024) which may contain asbestos. There is therefore a risk that HBM including asbestos may be present in surface soils / fill within the site or adjacent to the site within the larger property.

The risk of exposure to asbestos (if present) for the proposed development would be low given the proposed access road and BESS hardstand will be constructed with imported fill (minimising access to existing fill materials). Construction workers could be exposed to impacted soils/fill (if present) however during excavation of the service trench and general earthworks. An unexpected finds protocol (UFP) is therefore recommended to be outlined in the contractors construction environmental management plan (CEMP) as a precautionary measure to manage such risks in the event that HBM (including ACM) are identified during construction.

Groundwater: Laboratory analysis of selected groundwater samples collected for this assessment indicated contaminant concentrations were generally below the SAC for industrial land use, except for minor exceedances of the SAC for metals and PFAS. The concentrations of metals and PFAS in groundwater are considered to be attributed to background concentrations within the RAAF Williamtown PFAS Management Zone.

While the risks posed by the elevated heavy metals and PFAS in groundwater are considered low to human health based on the testing undertaken to date, work health and safety management plans for construction works likely to intercept groundwater (i.e. during trenching works) should include typical measures to minimise exposure to groundwater. This could include undertaking works during a dry period where groundwater levels are low / below the proposed excavation depth, use of appropriate personal protective equipment, adoption of work practices to minimise contact with groundwater and adhering to good personal hygiene practices.

In summary based on the results of the DSI it is considered that the site is suitable for the proposed industrial development. An UFP should be incorporated into the contractors CEMP to manage potential unexpected finds including HBM and hydrocarbon impacts if identified during construction.

Table of Contents

Report on Detailed site investigation (contamination)
Proposed Battery Energy Storage System (BESS)
103 Cabbage Tree Road, Williamtown NSW

1. Introduction

Douglas Partners Pty Ltd (Douglas) has been engaged by Quintasenergy on behalf of Hive Battery Developments Pty Ltd to prepare this detailed site investigation for contamination (DSI) for a proposed battery energy storage system (BESS) at 103 Cabbage Tree Road, Williamtown NSW (the site). The site is shown on Drawing 1, Appendix A.

The investigation was undertaken with reference to with Douglas' proposal 226269.01.P.001.Rev0 dated 14 February 2024.

The objective of the DSI is to assess the suitability of the site for the proposed development and whether further investigation and/or remediation / management is required. It is understood that the report will be used to support a development application for the proposed development.

This report must be read in conjunction with all appendices including the notes provided in Appendix B.

The following key guidelines were consulted in the preparation of this report:

- NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013); and
- NSW EPA *Guidelines for Consultants Reporting on Contaminated Land* (NSW EPA, 2020).

2. Proposed Development

Based on a review of the proposed development plans supplied by the client (HDB, project 23003 (BESS), drawing 2, rev G) and provided in Appendix A it is understood that the proposed development comprises the following:

- Construction of a fill platform to the south of the residential dwelling to support the proposed battery energy storage system (BESS);
- Construction of BESS on the fill platform;
- Temporary excavation of a service trench from the BESS to the existing connection point to the north-east. It is understood the trench will be 0.5 m wide, 1 m deep and a total length of approximately 90 m;
- Construction of a 4 m wide new access road from Cabbage Tree Road to BESS. The access road will be partly align with the existing access road as shown in Drawing 1, Appendix A.

As per email correspondence dated 26 March 2024 service trench alignment has been modified from the supplied drawings and runs down the eastern property boundary to the connection point (see Figure 1).

It is understood that aside from the excavation for the proposed service trench, disturbance to existing site soils will be limited, as the driveway and BESS are proposed to be constructed on newly imported fill.

The site boundary (development footprint) is shown on Drawing 1, Appendix A and Figure 1 below.

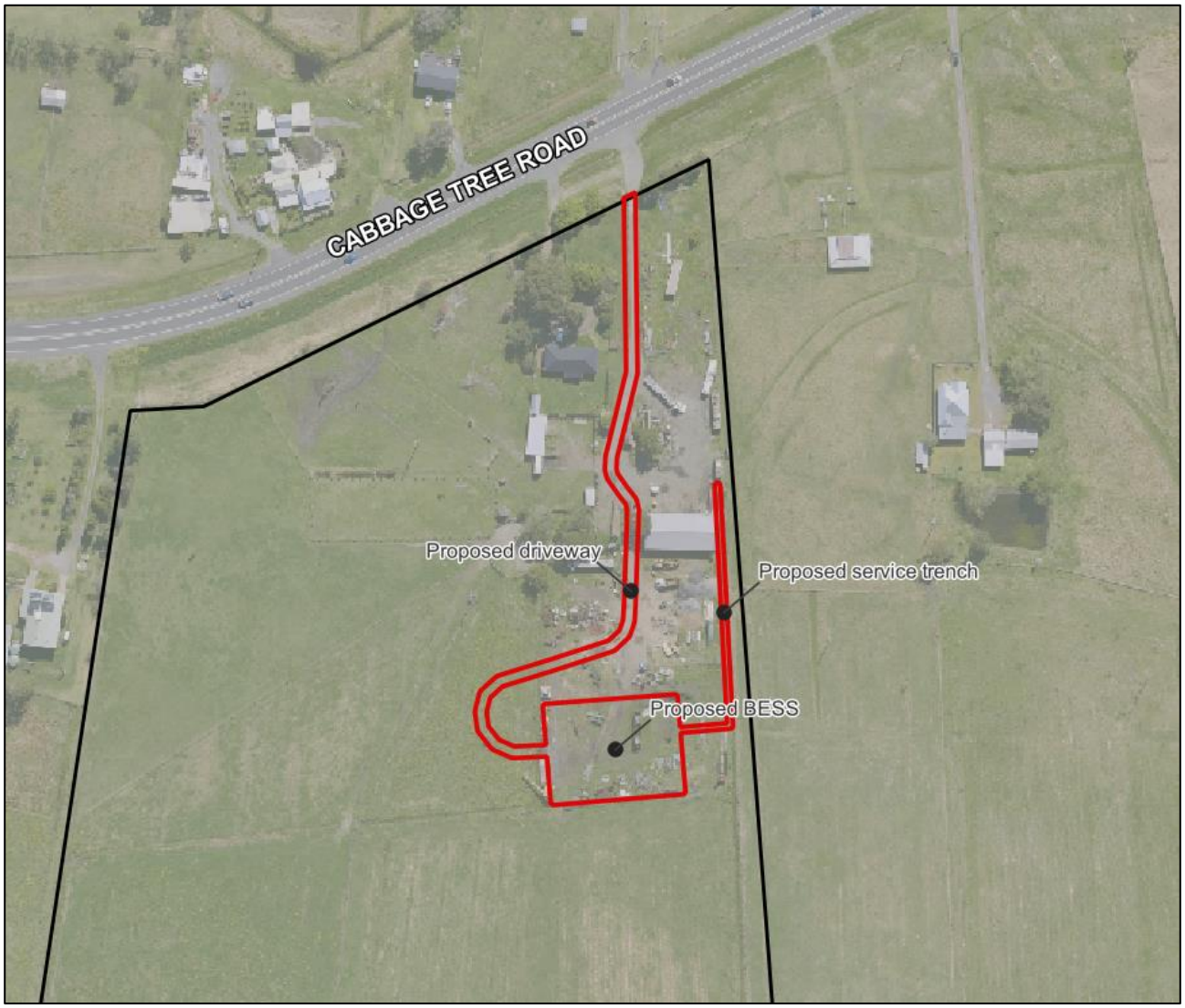


Figure 1: Site location, site boundary shown in red, lot boundary shown in black

3. Scope of Work

The scope of work is summarised as follows:

Preliminaries

- Preparation of safety and quality plans;
- Before You Dig Australia (BYDA) enquiry;
- Review of preliminary conceptual site model (CSM) (Douglas, 2024); and

- Preparation of brief sampling quality and analysis plan (SAQP) (refer to Section 8).

Field work (subsurface investigation)

Details of the field work completed to date is detailed in Section 10.1 and summarised as follows:

- Establishment of environmental engineer to site;
- Service location of proposed test locations using an accredited underground services locator;
- Drilling of boreholes using hand auger (designated 101 and 102);
- Excavation of test pits using an excavator and hand tools (designated 103 to 105 and 109 to 119);
    - Pit 103 to 108 were excavated for an alternative driveway design (superseded by current design). Pit 103 to 105 are relatively close to proposed service trench and results have therefore been included in this report. Pit 106 to 108 are relatively distant from the site and therefore results have not been included or analysed as a part of this investigation;
- Collection of soil samples from boreholes and test pits at regular depth intervals for identification and testing purposes, with reference to standard contamination sampling protocols;
- Screening of soil samples collected for the presence of volatile organic compounds (VOCs) using a photoionisation detector (PID);
- Installation of groundwater monitoring wells within selected boreholes (101 and 102);
- Development, purging and sampling of groundwater monitoring wells (101 and 102);
- Screening of groundwater monitoring well headspace and groundwater headspace for the presence of VOCs using a PID;
- Laboratory analysis of selected soil and groundwater samples collected for a suite of relevant contaminants.

Reporting

- Preparation of this report presenting the methods and results of the investigation, including an assessment of contamination, an assessment of the suitability of the site for the proposed development, preliminary waste classification, additional investigation requirements and requirements for remediation / management.

4. Site Information

Site Address	103 Cabbage Tree Road, Williamtown
Legal Description	Part Lot 1 DP996491
Approximate Area	Approximately 2800 m^2 of 9.3 ha allotment
Zoning	Rural landscape (RU2)
Local Council Area	Port Stephens Council (PSC)
Current Use	Rural residential
Surrounding Uses	Rural residential
Site Address	103 Cabbage Tree Road, Williamtown

5. Environmental Setting

Topography	Reference to NSW Department of Planning Central and Hunter Coast LiDAR 0.5 m contours indicates the regional topography is generally between RL0 (AHD) (drainage channels and low lying areas to the south of the site) and RL2 (generally to the north of the site). Site levels appear slope to the south, with levels between RL0.5 and RL1.5.
Soil Landscape	Reference to NSW Soil Landscapes of Central NSW index indicates the site is underlain by the 'Bobs Farm' soil landscape which typically comprises broad inter-barrier estuarine flats on the Tomago coastal plain. Typical limitations include: permanently high water tables, seasonal waterlogging, foundation hazard, flood hazard and potential acid sulfate soils.
Geology	Reference to NSW Seamless Geology mapping indicates the site is underlain by two geological units as follows: • Northern portion of the site: Holocene aged estuarine channel deposits which typically comprise sand, silt, clay, shell and gravel; and • Southern portion of the site: Holocene aged estuarine swamp which typically comprises organic mud, peat, clay silt and sand.
Acid Sulfate Soils	Reference to NSW Acid Sulfate Soil risk mapping indicates the site is mapped as high probability of occurrence between 1 m and 3 m below ground surface.
Surface Water and Groundwater	Search of NSW registered groundwater bores indicates the following registered groundwater bores within 500 m of the site: • 150 m west – GW078012 – 24/11/1992 – domestic use standing water at 1.5 m below ground level; and • 350 m north-east – GW067175 – domestic use – standing water at 1.5 m. Based on the regional topography and the inferred flow direction of nearby water courses, the anticipated flow direction of groundwater and surface water beneath the site is to the south towards The Fourteen Foot Drain (assumed to be fresh water) which is to the south of the site (downgradient), this drain then flows into Fullerton Cove (assumed to be estuarine/marine water). Given the site is within Williamtown primary PFAS management zone, beneficial uses of groundwater and surface water is likely to be limited.

6. Summary of Previous Investigations

6.1 Preliminary Site Investigation (contamination) – Douglas Partners (Douglas, 2024)

Douglas have previously undertaken a preliminary site investigation (contamination) (PSI) for the proposed BESS in January 2024. The investigation included site history review, site walkover and preparation of a preliminary conceptual site model (CSM).

The results of the PSI indicated the potential for gross contamination at the site arising from on-site sources is generally considered to be low to moderate, with the main risks associated with potential HBM from demolition and renovation of buildings, potential contaminants within imported filling (source unknown) and vehicle/truck/machinery maintenance (and storage of associated chemicals/hydrocarbons) on unsealed areas.

Furthermore, the results of the PSI indicate the site is down gradient of the Williamtown RAAF Base and within the primary PFAS management zone. Therefore, the potential for PFAS contamination at the site is considered to be high.

An assessment of subsurface soils and groundwater was recommended prior to development in order to assess the identified potential sources of contamination and assess site suitability with regard to the proposed development.

6.2 Geotechnical and Acid Sulfate Soil Assessment – Douglas Partners (Douglas, 2023)

Douglas have previously undertaken a geotechnical and acid sulfate soil assessment for the proposed power connection conduits in December 2023. The investigation included drilling of two bores in the vicinity of the proposed BESS area. Subsurface conditions encountered by these bores were fill comprising gravelly sand / sandy clay / silty sandy clay to a maximum depth of 1.0 m, underlain by sandy clay / silty clay to a maximum depth of 3.0 m (limit of investigation). Filling included observations of brick, building material and rootlets.

Groundwater was observed from 0.9 to 2.6 m below ground level whilst the bores remained open. It should be noted that groundwater levels are affected by factors such as climatic conditions and soil permeability and therefore vary with time.

Selected soil samples were subject to acid sulfate soil screening and acid base accounting. Results of laboratory testing indicated the presence of acid sulfate soils in subsurface soils at the site and recommended disturbance of ASS be managed under a site-specific acid sulfate soil management plan (included in the report).

6.3 Soil and Surface Water Testing – Douglas Partners (Douglas, 2018)

Douglas have previously undertaken soil and surface water testing along Cabbage Tree Road in August 2018. The investigation included drilling one bore and sampling surface waters from a drain adjacent to Cabbage Tree Road approximately 180 m north-east of the site (named ‘Location 3’). Results of laboratory testing indicated the following:

- Detections of PFOA, PFOS, PFHxS, PFHxA and PFHpA in soil sample tested (3/0.1 m); and
- Detections of PFOA, PFOS, PFBS, PFHxS, PFBA, PFHxA, PFHpA and PFNA in surface water sample tested (SW3).

6.4 RAAF Base Williamtown PFAS Management Area Plan - AECOM (AECOM, 2023)

AECOM have developed a PFAS management area plan (PMAP) for the RAAF base Williamtown in December 2023. The PMAP was updated to incorporate progress of remediation, new data, changes in policy and advances in understanding PFAS.

Pertinent findings from this report are as follows:

- The site is within the primary management zone (northern portion of the site) and secondary management zone (southern portion of the site);
- Surface water and groundwater flow from RAAF base flows south towards the site. Groundwater levels at the site is mapped as approximately RL 0 to RL 1;
- Groundwater monitoring well (named MW230S), approximately 50 m west of the site, not sampled in May 2021 monitoring round.

Report included figures which summarised groundwater, surface water and sediment sampling conducted in May 2021. PFOS + PFHxS was detected in numerous groundwater/surface water samples in the vicinity of the site. Absence of PFOS + PFHxS in sediment samples in the vicinity of the site.

7. Preliminary Conceptual Site Model

A conceptual site model (CSM) is a representation of site-related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. The CSM provides the framework for identifying how the site became contaminated and how potential receptors may be exposed to contamination either in the present or the future i.e. it enables an assessment of the potential source – pathway – receptor linkages (complete pathways).

Based on the previous investigation by Douglas (Douglas, 2024), the following potential sources of contamination and associated contaminants of potential concern (CoPC) have been identified and summarised in Table 1.

Table 1: Summary Of Potential Sources

Potential sources and associated CoPC
On site **S1:** Demolition and renovations of former buildings. COPC include metals and asbestos. **S2:** Fill associated with driveways, fill pads and general site filling. COPC include metals, total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene, xylene (BTEX), polycyclic aromatic hydrocarbons (PAH), polychlorinated biphenyls (PCB), organochlorine pesticides (OCP), organophosphorus pesticides (OCP), phenols and asbestos subject to source. **S3:** Spills and leaks associated with storage of hydrocarbons, storage / maintenance of vehicles and associated machinery within or adjacent to the site. COPC include metals, TRH, BTEX, PAH, volatile organic compounds (VOC) and phenols. **S4:** Agricultural production (cropping) and yard maintenance and associated use of pesticides and fertilisers. COPC include metals, pesticides (including OCP, OPP) TRH, BTEX, PAH, nutrients.
Off site **S5:** Incinerator. COPC include metals, TRH, PAH and dioxins. **S6:** PFAS in surface water and groundwater, associated with RAAF Base Williamtown COPC include PFAS.

The following potential human and environmental receptors, along with relevant potential pathways, have been identified and summarised in Table 2.

Table 2: Summary Of Potential Receptors And Pathways

Potential human receptors
HR1: Current users – rural residential/commercial **HR2:** Construction and maintenance workers **HR3:** End users – rural residential/commercial **HR4:** Adjacent site users – rural residential
Potential environmental receptors
ER1: Surface water – The Fourteen Foot Drain and Fullerton Cove **ER2:** Groundwater **ER3:** Terrestrial ecosystems
Potential pathways to human receptors
HP1: Ingestion and dermal contact **HP2:** Inhalation of dust and/or vapours
Potential pathways to environmental receptors
EP1: Surface water run-off **EP2:** Leaching of contaminants and vertical migration into groundwater **EP3:** Lateral migration of groundwater providing base flow to water bodies **EP4:** Inhalation, ingestion and absorption

Summary Of Potentially Complete Exposure Pathways

A 'source–pathway–receptor' approach has been used to assess the potential risks of harm being caused to human or environmental receptors from contamination sources on or in the vicinity of the site, via exposure pathways (potential complete pathways). The possible pathways between the above sources (S1 to S6) and receptors are provided in below in Table 3.

Table 3: Summary Of Potentially Complete Exposure Pathways

Source And COPC	Exposure Pathway	Receptor	Risk Management Action
S1: Demolition and renovations of former buildings: metals and asbestos. **S2:** Fill: metals, TRH, BTEXN, PAH, PCB, OCP, OPP, phenols and asbestos. **S3:** Spills and leaks associated with storage of hydrocarbons, storage / maintenance of vehicles: TRH, BTEX, PAH, VOC and phenols. **S4:** Agricultural: metals, pesticides (including OCP, OPP) TRH, BTEXN, PAH and nutrients.	**HP1:** Ingestion and dermal contact **HP2:** Inhalation of dust and/or vapours	**HR1:** Current users (rural residential/commercial) **HR2:** Construction and maintenance workers **HR3:** End users (industrial)	An intrusive investigation is recommended to assess possible contamination including testing of the soils and groundwater.
	HP2: Inhalation of dust and/or vapours	**HR4:** Adjacent site users (rural residential)	
	EP1: Surface water run-off **EP3:** Lateral migration of groundwater providing base flow to water bodies	**ER1:** Surface water	
	EP2: Leaching of contaminants and vertical migration into groundwater	**ER2:** Groundwater	
	EP4: Inhalation, ingestion and absorption	**ER3:** Terrestrial ecosystems	
S5 (off site): Incinerator: metals, TRH, PAH and dioxins.	**HP2:** Inhalation of dust and/or vapours	**HR1:** Current users (rural residential/commercial) **HR2:** Construction and maintenance workers **HR3:** End users (industrial)	An intrusive investigation is recommended to assess possible contamination including testing of the soils and groundwater.
	EP1: Surface water run-on **EP3:** Lateral migration of groundwater onto site	**ER1:** Surface water **ER2:** Groundwater	
	EP4: Inhalation, ingestion and absorption	**ER3:** Terrestrial ecosystems	
S6 (off-site): RAAF Base Williamtown: PFAS.	**HP2:** Inhalation of dust and/or vapours	**HR1:** Current users (rural residential/commercial) **HR2:** Construction and maintenance workers **HR3:** End users (industrial)	An intrusive investigation is recommended to assess possible contamination including testing of the soils, surface water and groundwater.
	EP1: Surface water run-on **EP3:** Lateral migration of groundwater onto site	**ER1:** Surface water **ER2:** Groundwater	
	EP4: Inhalation, ingestion and absorption	**ER3:** Terrestrial ecosystems	

8. Sampling Plan

8.1 Data Quality Objectives

The DSI was devised with reference to the seven-step data quality objectives (DQO) process which is provided in Appendix B Schedule B2, NEPC (2013). The data quality objective process is outlined in Appendix C.

8.2 Soil Sampling Rationale

Based on the CSM and data quality objectives (DQO) the following sampling rationale was adopted.

Table 2 of NSW EPA (2022) recommends a minimum of 9 sampling points for a site of 0.3 ha for site characterisation based on the detection of circular hot spots using a systemic grid sampling pattern (NSW EPA, 2022).

The systematic grid spacing was adjusted to target specific areas of concern identified within site history and the CSM (ie combined systematic and targeted sampling rationale).

Borehole and test pit locations are shown on Drawing 1, Appendix A, with the rationale provided in Table 4 below.

Table 4: Sampling Rationale

Location ID	Source# (see Table 3)	Type	Rationale
101* and 102*	S1 to S4 and S6	Hand auger	Downgradient of maintenance shed and fill pad and within proposed trench alignment. Well installed to assess groundwater quality likely to be intercepted during trenching.
103	S1 to S4 and S6	Test pit	General site coverage, down gradient of fill platform.
104	S1 to S4 and S6	Test pit	Within former building footprint and adjacent to maintenance shed.
105	S1 to S4 and S6	Test pit	General site coverage, down gradient of storage area/waste oil IBC.
109	S2 to S4 and S6	Test pit	Positioned within fill.
110	S2 to S4 and S6	Test pit	Positioned within fill.
111	S2 to S4 and S6	Test pit	Positioned within fill.
112	S2 to S4 and S6	Test pit	Positioned within proposed trench alignment.
113	S4 and S6	Test pit	Positioned within proposed driveway alignment.

Location ID	Source# (see Table 3)	Type	Rationale
114	S2 to S4 and S6	Test pit	Positioned within proposed driveway alignment and within fill and adjacent to fuel tank in stockpile of metal
115	S2 to S4 and S6	Test pit	Positioned within proposed driveway alignment and within fill and adjacent to fuel tank in stockpile of metal
116	S1 to S5 and S6	Test pit	Positioned within proposed driveway alignment, fill and former building footprint.
117	S2 to S4 and S6	Test pit	Positioned within proposed driveway alignment and within fill.
118	S2 to S4 and S6	Test pit	Positioned within proposed driveway alignment and within fill and adjacent to fuel tank in stockpile of metal.
119	S2 to S4 and S6	Test pit	Positioned within proposed driveway alignment and within fill.

Notes to table:
* indicates groundwater monitoring well installed/sampled at location
# Potential source of contamination

Soil samples were collected from each borehole / test pit at depths of approximately 0.1 m, 0.5 m, 1.0 m and every 0.5 m thereafter, and changes in lithology or signs of contamination.

The general sampling methods are described in the field work methodology, included in Appendix D.

8.3 Groundwater Sampling Rationale

In order to assess the current groundwater contamination status likely to be intercepted during trench construction for the proposed development, sampling from two monitoring wells (101 and 102) was undertaken.

The locations were selected based on the following rationale:

- 101 – positioned adjacent to location 112 and will provide data on the concentration of contaminants in groundwater likely to be intercepted during construction of the service trench; and
- 102 – positioned adjacent to location 104 adjacent to maintenance shed and will provide data on the concentration of contaminants in groundwater likely to be intercepted during construction of trench.

The general sampling methods are described in the field work methodology, included in Appendix D.

9. Site Assessment Criteria

The site assessment criteria (SAC) applied in the current investigation are informed by the CSM (Section 7) which identified human and environmental receptors to potential contamination on the site. Analytical results are assessed (as a Tier 1 assessment) against the SAC comprising primarily the investigation and screening levels of Schedule B1 of NEPC (2013).

The investigation and screening levels applied in the current investigation comprise levels adopted for a generic commercial / industrial land use scenario. The derivation of the SAC is included in Appendix E and the adopted SAC are listed on the summary analytical results tables in Appendix G.

10. Results

10.1 Field Work Results

10.1.1 Soil

The boreholes and test pits (designated 101 to 105 and 109 to 119) were drilled/excavated between 28 February 2024 and 9 April 2024. Details of the subsurface conditions encountered are detailed on the logs in Appendix F. The logs recorded the following general sub-surface units:

Unit 1 – Fill/topsoil

- Unit 1.1 – Topsoil/ silty sand: generally comprising brown silty sand, with rootlets (Bore 101 and Pit 103, 113 and 114 only);
- Unit 1.2 – Fill / silty sand / gravelly sand / sandy clay: generally comprising brown to grey silty sand, inclusions of asphalt, brick, ceramic, concrete, geofabric, glass, metal, plastic, PVC, rubber and tile (most test locations see Table 5.).
- Unit 1.3 – Fill (other) / silty sand: generally comprising dark brown to grey with rootlets, inclusions of metal, paper (Pit 109 to Pit 112 and Pit 116 only).

Unit 2 – Natural

- Unit 2 – sandy clay / clay: dark brown mottled orange / grey mottled orange.
  - Clayey sand between 1.8 m to 2.0 m depth (Bore 102 only); and
  - Silty sand between 0.3 m to 0.7 m depth (Pit 114 only).

Subsurface summary of units encountered at each test location is shown in Table 5.

Table 5: Subsurface summary

Unit	Location Depth Range Encountered (m below ground level)															
	101	102	103	104	105	109	110	111	112	113	114	115	116	117	118	119
1.1	0.0 - 0.2	-	0.0 - 0.2	-	-	-	-	-	-	0.0 - 0.4	0.3 – 0.7	-	-	-	-	-
1.2	-	0.0 - 0.8	-	0.0 - 0.8	0.0 - 0.6	-	-	-	-	-	0.0 - 0.3	0.0 - 0.6	0.0 - 0.45	0.0 - 0.4	0.0 - 0.25	0.0 - 0.35
1.3	-	-	-	-	-	0.0 - 0.2	0.0 - 0.25	0.0 - 0.6	0.0 - 0.15	-	-	-	0.45 - 0.7	-	-	-
2	0.2 - 2.0*	0.8 - 2.8*	0.2 to 1.0*	0.8 - 1.0*	0.6 - 1.1*	0.2 - 1.1*	0.25 - 1.0*	0.6 - 1.0*	0.15 – 1.0*	0.4 - 0.70*	0.7- 0.95*	0.6 - 1.1*	0.7 - 1.0*	0.4 - 0.5*	0.25 - 0.50*	0.35 - 0.5*

Notes to table:
* limit of investigation

No visual or olfactory evidence (e.g. staining, odours, free phase product) was observed during the investigations to suggest the presence of contamination within the soils or groundwater observed at the site except for:

- Pale green staining observed at Pit 118 at 0.25 m to 0.30 m, suggesting potential hydrocarbon impact at Pit 118. It is noted Pit 118 was located adjacent to an empty fuel tank in a metal stockpile.

The PID screening of samples collected suggested the following:

- PID between 9 ppm and 47 ppm at Pit 118 and Pit 119 suggesting the potential presence of hydrocarbons or volatile organic compounds at Pit 118 and Pit 119; and
- Remainder of locations / samples screen recorded values of less than 6 ppm (mostly less than 1 ppm) suggesting the absence, or very low concentrations, of VOC in the samples tested.

Observations of free groundwater during drilling / excavation of bores / pits are summarised in Table 6. It should be noted that groundwater levels are affected by factors such as climatic conditions and soil permeability and therefore vary with time.

Table 6: Summary of groundwater observations during drilling/excavation

Location	Date	Depth to groundwater (m below ground level)
101	28 February 2024	1.2
102	28 February 2024	1.2
103	13 March 2024	>1.0*
104	13 March 2024	>1.0*
105	13 March 2024	>1.1*
109	13 March 2024	>1.1*
110	13 March 2024	>1.1*
111	13 March 2024	>1.0*
112	13 March 2024	>0.75*
113	9 April 2024	0.65
114	9 April 2024	>0.95*
115	9 April 2024	1.0
116	9 April 2024	0.9
117	9 April 2024	>0.5*
118	9 April 2024	>0.5*
119	9 April 2024	>0.5*

Notes to table:
* limit of investigation

10.1.2 **Groundwater**

Groundwater monitoring well construction is detailed on the borehole logs in Appendix F and are summarised in Table 7.

Table 7: Summary of groundwater monitoring well construction

Well ID	Ground Level RL	Screened Interval (m Bgl)	Screened Interval RL
101	1.2	0.30 to 1.80	0.9 to -0.6
102	1.3	0.75 to 2.25	0.55 to -0.95

Notes to table:
AHD Australian Height Datum
RL Reduced level (m AHD)
bgl below ground level

Groundwater levels were gauged within the installed wells on the site between 29 February 2024 to 9 April 2024 using an electronic oil/water interface meter. The measured water levels are shown in Table 8 and with measured field parameters (during sampling) in Table 9.

Table 8: Summary Of Groundwater Level Measurements

Well ID	Location of monitoring well	Ground level (RL)	TOC (RL)	29 February 2024 (prior to development)		13 March 2024 (prior to sampling)		9 April 2024 (gauging event)		Range of observations	
				m bTOC	RL	m bTOC	RL	m bTOC	RL	RL min	RL max
101	Southern area of proposed trench	1.2	1.9	1.9	0.0	2.0	-0.1	1.2	0.7	-0.1	0.7
102	Northern area of proposed trench	1.3	2.1	2.1	0.0	2.2	-0.1	1.3	0.8	-0.1	0.8

Notes:
AHD Australian Height Datum
RL Reduced level (m AHD)
SWL standing water level
bTOC below top of casing

Table 9: Summary Of Field Parameters (Groundwater) Prior To Sampling (13 March 2024)

Well ID	PID (ppm)		Thickness of free product	Temp. (°C)	pH	EC (µS/cm)	ORP (mV)	DO (ppm)	Turbidity (NTU)	Comment
	Well headspace	Groundwater headspace								
101	<1	<1	<1	29.7	6.4	937	6	0.71	>1000	Very turbid, dark brown, strong sulphur odour
102	<1	<1	<1	23.1	6.1	712	-49	0.11	170	Slightly turbid, pale brown, trace sulphur odour

Notes to table:
PID Photoionisation detector
DO Dissolved oxygen
NTU Nephelometric turbidity units
EC Electrical conductivity
ORP Oxidation reduction potential

Based on the groundwater level measurements and surface topography, groundwater is expected to be flowing to the south towards The Fourteen Foot Drain then Fullerton Cove.

The dissolved oxygen levels indicated generally low oxygen conditions. The pH was slightly acidic (i.e. 6.1 to 6.4). The electrical conductivity values are typical of fresh water. Redox potential indicates slightly oxidising conditions at 101 and reducing conditions at 102. No light non-aqueous phase liquid (LNAPL) was observed during gauging. The PID screening recorded values of less than 1 ppm in well headspace and groundwater headspace suggesting the absence, or very low concentrations, of VOC in the groundwater screened.

10.2 Laboratory Analytical Results

Laboratory testing was undertaken on selected soil and groundwater samples for the CoPC outlined within the preliminary CSM (see Section 7). The analytical programme for the current assessment is summarised in Table 10.

Table 10: Summary Of Laboratory Testing Programme

Media	Analytes Tested	Number Of Primary Samples	Number Of Replicate Samples
Soil	TRH, BTEX, PAH, metals	22	3
	OCP, OPP, PCB	10	3
	PFAS	5	0
	Asbestos 500ml	10	0
	Asbestos ID (fragment)	1	0
Groundwater	Metals, TRH, BTEX, PAH, VOC, PFAS	4	1

Notes to table:

TRH	total recoverable hydrocarbons
BTEX	benzene, toluene, ethylbenzene, xylene
PAH	polycyclic aromatic hydrocarbons
OCP	organochlorine pesticides
OPP	organophosphorus pesticides
PCB	polychlorinated biphenyls
PFAS	per and polyfluorinated substances
VOC	volatile organic compounds

The laboratory testing was undertaken by Envirolab Services Pty Ltd, a NATA accredited laboratory. Analytical methods used are shown in the laboratory sheets in Appendix G.

The results of laboratory analysis are summarised in the following tables in Appendix G:

- Table G1: Summary of Laboratory Results – Land use
- Table G2: Summary of Laboratory Results – Waste classification
- Table G3: Summary of Laboratory Results – Groundwater

The laboratory certificates of analysis together with the chain of custody and sample receipt information is provided in Appendix G.

11. Discussion

11.1 Soils

Land use

The results of testing indicate BTEX, phenols, PCB, OCP and OPP were not detected above practical quantitation limits (PQL) at the sampling locations tested. The tested soil samples were within the SAC with the exception of:

- Benzo(a)pyrene – samples 105/0.5 m, 117/0-0.1 m, 118/0-0.1 m and D3/MJD (replicate of 118/0-0.1 m). These exceedances are less than 2.5 times the SAC and are therefore not considered a hotspot as per (NEPC, 2013). The NEPM (2013) ESL of 1.4 mg/kg for benzo(a)pyrene is understood to be based on a single invertebrate species referenced in the Canadian Soil Quality Guidelines (1999 and since updated) and is considered conservative in an Australian context. Higher reliability screening values have been published in CRC CARE *Risk-based Management and Remediation Guidance for Benzo(a)pyrene* (CRC CARE, 2017). The high reliability value of 172 mg/kg for aged contamination for commercial and industrial land use was recommended (CRC CARE, 2017) and therefore has been adopted. Therefore, the exceedances of ESL in the samples tested are not considered significant;
- Zinc – sample D1/LAH inter-laboratory duplicate (D1/LAH being a field duplicate sample of 105/0-0.1m) which contained a concentration of zinc of 510 mg/kg over the SAC (300mg/kg). It is noted that the zinc concentration in the primary, field duplicate and lab duplicate / triplicate samples ranged from 68 mg/kg to 510 mg/lg with an average concentration of 196 mg/kg which suggests the fill material are heterogenous and / or the results are influenced by trace metal particulates observed within the fill. The minor exceedances of this ecological investigation limit (EIL) is not considered to be significant for the proposed development on this basis and also given the development in the vicinity of Pits 115 comprises construction of a driveway (fill placement) overlying current site soils.

The results of testing have also been compared to residential land use criteria (HIL A) (NEPC, 2013) to assess the risk of soil contaminants to existing users of the site. The soils tested at the site were generally within the human health residential land use criteria with the exception of B(a)P TEQ in 105/0.5m, 117/0-0.1m and 118/0-0.1m, which exceed the health investigation level (HILA of 3 mg/kg).

While asbestos has not been detected in laboratory analysis, building demolition materials, such as tile, brick, ceramic, concrete were located in below-ground fill and these are considered as indicative of the possible presence of hazardous building materials (HBM), including asbestos. Fibro sheeting materials were also identified adjacent to the site in (Douglas, 2024) which may contain asbestos. Given the proposed development comprises importation of fill to construct the proposed driveway and fill mound, the risk of exposure to asbestos (if present within existing fill materials), however, is considered to be low post construction. It is noted that a detailed asbestos assessment (not currently completed), including screening of bulk soil samples with reference to NEPC (2013) would be required to adequately assess the risk to current site users (residential/commercial) or to construction workers during excavation of the proposed service trench (refer to Section 13 for further comments).

Preliminary Waste Classification

A preliminary waste classification was undertaken on tested soils to inform potential disposal options for soils tested. Analytical testing of soil samples detected exceedances of the contaminant threshold for general solid waste (GSW) CT1 for lead in one sample and benzo(a)pyrene in three samples.

As per the waste classification assessment guidelines (NSW EPA, 2014), toxicity characteristic leaching procedure (TCLP) analysis was conducted on samples with recorded total contaminant exceedances (CT1) to determine the leachable characteristics of the material and confirm waste classification.

Furthermore with reference to waste classification guidelines for PFAS containing soils (NSW EPA, 2016), TCLP was conducted on samples with PFAS concentrations detected above laboratory practical quantitation limits (PQL) to determine the leachable characteristics of the material and confirm waste classification.

Samples tested for asbestos indicated an absence of bonded asbestos and friable asbestos (FA) / asbestos fines (AF) in samples tested. It is noted that asbestos impacted soils are classified as "Special Waste" in additional to their chemical classification with reference to (NSW EPA, 2014).

All TCLP results were below the TCLP1 thresholds and total concentrations were below SCC1 thresholds indicating that the soils tested would be suitable for disposal as GSW (non-putrescible) (SCC1/TCLP1).

This waste classification is preliminary in nature Further assessment of the waste classification of site soils would be required (if off-site disposal was proposed) to confirm off-site disposal and/or re-use opportunities with reference to sampling design guidelines (NSW EPA, 2022), waste classification guidelines (NSW EPA, 2014) and appropriate resource recovery orders and exemptions (where applicable).

11.2 Groundwater

The analytical results indicate that groundwater sampled and tested were below practical quantitation limits (PQLs) for BTEX, PAH and VOC. All results were below the SAC, with the exception of:

- pH in both locations which were marginally below NHMRC (2012) recreational waters criteria (aesthetic only) and ANZECC (2000) default trigger values for low land rivers;
- Cobalt at 102 which marginally exceeded ANZG (2018) freshwater criterion of 1.4 µg/L;
- Copper at both locations which exceeded ANZG (2018) freshwater criterion (1.4 µg/L) and marine water criterion (1.3 µg/L);
- Manganese at both locations which exceeded ANZG (2018) marine water criterion of 80 µg/L;
- Nickel at 101 which marginally exceeded ANZG (2018) freshwater criterion of 11 µg/L;
- Zinc in both locations which exceeded ANZG (2018) freshwater/marine water criterion of 8 µg/L; and
- PFOS in both locations which exceeded the HEPA (2020) freshwater 99% LOP of 0.00023 µg/L.

Based on our experience in the area, the concentrations of metals and PFAS in groundwater are considered to be attributed to background concentrations within the RAAF Williamtown PFAS Management Zone.

Long-chain hydrocarbons (F2 and F3) were detected in groundwater in Well 102 which may be associated with site activities, however, concentrations are low and within the SAC and were not identified in the downgradient well (Well 101) suggesting the impact is localised. The result in consistent with the soil testing which only identified low concentrations of long-chain hydrocarbons (F2 to F4) in soil.

11.3 Data Quality Assurance And Quality Control

The data quality assurance and quality control (QA/QC) results are included in Appendix H. Based on the results of the field QA and field and laboratory QC, and evaluation against the data quality indicators (DQI) it is concluded that the field and laboratory test data obtained are generally reliable and useable for this assessment.

12. Revised Conceptual Site Model

The data collected for this DSI has generally confirmed that certain potential contaminant sources outlined in the CSM outlined in Section 7 pose a potentially complete pathway to the identified receptor(s) whilst others do not. No other sources of contamination have been identified as a result of the testing results. This is summarised in Table 11.

Table 11: Updated Summary Of Potentially Complete Exposure Pathways (Proposed Land Use)

Source And Copc	Exposure Pathway	Receptor	Risk Management Action
S1: Demolition and renovations of former buildings: asbestos. **S2:** Fill: asbestos.	**HP1:** Ingestion and dermal contact **HP2:** Inhalation of dust and/or vapours	**HR1:** Current users (rural residential / commercial) **HR2:** Construction and maintenance workers **HR3:** End users (industrial)	Testing of soil and groundwater indicates that contaminants associated with S1 and S2 do not appear to be significantly impacting the site with regard to the proposed development. While asbestos has not been detected in laboratory analysis, building demolition materials, such as tile, brick, concrete, ceramic were located in below-ground fill and these are considered as indicative of the possible presence of hazardous building materials (HBM), including asbestos. Fibro sheeting materials were also identified adjacent to the site in (Douglas, 2024) which may contain asbestos. As a precautionary measure controls should be in place in the event that ACM are disturbed during construction (relevant to HP2) such as an unexpected finds protocol (UFP).
	HP2: Inhalation of dust and/or vapours	**HR4:** Adjacent site users (rural residential)	

Source And Copc	Exposure Pathway	Receptor	Risk Management Action
			Alternatively additional investigation (including sieving of bulk samples) in areas of potential exposure (ie trench alignment) could be undertaken to further assess the risk of ACM impacts.
S3: Spills and leaks associated with storage of hydrocarbons, storage / maintenance of vehicles: TRH, BTEX, PAH, VOC and phenols.	-	-	Testing of soil and groundwater indicates that contaminants associated with S3 do not appear to be significantly impacting the site. Low concentrations of long-chained hydrocarbons (F3 & F4) and PAHs were identified broadly across the site which is likely to be associated with this source. The UFP should make allowance for concentrated hydrocarbon impacts if identified during construction.
S4: Agricultural: metals, pesticides (including OCP, OPP) TRH, BTEXN, PAH and nutrients.	-	-	Testing of soil and groundwater indicates that potential contaminants associated with S4 do not appear to be significantly impacting the site.
S5 (off site): Incinerator: metals, TRH, PAH and dioxins.	-	-	Testing of soil and groundwater indicates that potential contaminants associated with S5 do not appear to be significantly impacting the site.
S6 (off-site): RAAF Base Williamtown: PFAS.	**HP2:** Inhalation of dust and/or vapours	**HR1:** Current users (rural residential/commercial) **HR2:** Construction and maintenance workers **HR3:** End users (industrial)	Testing of soil indicates PFAS concentrations in soil below SAC. Testing of groundwater indicates PFOS concentrations in groundwater above the freshwater default guideline value for protection of aquatic ecosystems, however, concentrations were within recreational guidelines which have been adopted for assessment of construction workers. Interim control measures should be implemented during construction to manage risks to HR1 to HR3.
	EP1: Surface water run-on **EP3:** Lateral migration of groundwater onto site	**ER1:** Surface water **ER2:** Groundwater	
	EP4: Inhalation, ingestion and absorption	**ER3:** Terrestrial ecosystems	

13. Conclusions and Recommendations

13.1 Key Findings

Soil

Soil testing completed to date indicated that concentrations of primary target CoPC in soils are within NEPC (2013) criteria for industrial land use.

Brief comparison of soil testing results completed to date indicated that concentrations of primary target CoPC in soils are also generally within NEPC (2013) criteria for residential land use with the exception of concentrations of PAH (B(a)P TEQ).

Asbestos was not detected in laboratory analysis completed to date, however, building materials such as tile were observed in below-ground fill and this is considered an indication of hazardous building materials (HBM) such as asbestos. Fibro sheeting materials were also identified adjacent to the site in (Douglas, 2024) which may contain asbestos. There is therefore a risk that HBM including asbestos may be present in surface soils / fill within the site or adjacent to the site within the larger property.

The risk of exposure to asbestos (if present) for the proposed development would be low given the proposed access road and BESS hardstand will be constructed with imported fill (minimising access to existing fill materials). Construction workers could be exposed to impacts soils/fill (if present) however during excavation of the service trench and general earthworks. An unexpected finds protocol (UFP) is therefore recommended to be outlined in the contractors construction environmental management plan (CEMP) as a precautionary measure to manage such risks in the event that HBM (including ACM) are identified during construction.

Alternatively additional investigation (including sieving of bulk samples) in areas of potential exposure (i.e. trench alignment) could be undertaken to further assess the risk of ACM impacts.

Groundwater

Groundwater testing completed to date indicated:

- Minor exceedances of metals (cobalt, copper, manganese, nickel and zinc) and PFOS above the adopted SAC for protection of aquatic ecosystems in most samples tested. Concentrations of metals and PFAS were within the NHMRC (2012) recreational criteria which has been adopted for assessment of risk to site workers conducting trenching works;
- A slightly low pH (i.e. mildly acid conditions) which marginally exceeded both aquatic ecosystem and recreational use criteria. The mildly acidic groundwater is considered typical for the area and not considered significant.

The site is within Williamtown RAAF Primary Management Zone and therefore the concentration of PFOS in groundwater is considered likely to be attributed to the background concentrations that would be associated with impact from Williamtown RAAF Base. Reference to PFAS Management Area Plan for RAAF Base Williamtown (AECOM, 2023) indicates that testing of groundwater in May 2021 in the vicinity of the site yielded concentrations of PFOS + PFHxS between limit of reporting and 50 ug/L, which is orders of magnitude higher than concentrations detected in groundwater samples analysed for the site. The metal concentrations in groundwater

are also typical of background concentrations within the area and typical for developed areas. Remediation of PFAS or heavy metal impacted groundwater is therefore not considered warranted.

While the risks posed by the elevated heavy metals and PFAS in groundwater are considered low to human health based on the testing undertaken to date, work health and safety management plans for construction works likely to intercept groundwater (i.e. during trenching works) should include typical measures to minimise exposure to groundwater. This could include undertaking works during a dry period where groundwater levels are low / below the proposed excavation depth, use of appropriate personal protective equipment, adoption of work practices to minimise contact with groundwater and adhering to good personal hygiene practices. Reference should also be made to the on-line NSW EPA guidance and factsheet in relation to PFAS impacts associated with the Williamtown RAAF which can be found at https://www.epa.nsw.gov.au/working-together/community-engagement/updates-on-issues/raaf-williamtown-contamination/williamtown-precautionary-advice

It is assumed that dewatering will not be undertaken for the development. If dewatering was proposed, appropriate approvals and licenses would be required in accordance with regulatory requirements and treatment of the groundwater would likely be required prior to discharge given the elevated contaminants within groundwater.

13.2 **Conclusion**

In summary based on the results of the DSI it is considered that the site is suitable for the proposed industrial development. An UFP should be incorporated into the contractors CEMP to manage potential unexpected finds including HBM and hydrocarbon impacts if identified during construction.

14. References

AECOM. (2023). *RAAF Base Williamtown, PFAS management plan, revision 1, September 2023*. AECOM.

ANZECC. (2000). *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. Australia and New Zealand Environment and Conservation Council.

CRC CARE. (2017). *Risk-based Management and Remediation Guidance for Benzo(a)pyrene*. Technical Report no. 39: Cooperative Research Centre for Contamination Assessment and Remediation of the Environment.

Douglas. (2018). *Soil and Surface Water Testing, Open Drain Maintenance, Cabbage Tree Road & Lavis Lane, Williamtown*. Douglas Partners Pty Ltd: Document No. 91398.00.R.001.Rev0.

Douglas. (2023). *Report on geotechnical and acid sulfate soil investigation, Nelson Bay Road, Williamtown NSW*. Douglas Partners Pty Ltd: Document No. 226269.00.Rev0.

Douglas. (2024). *Report on Preliminary Site Investigation (Contamination), 103 Cabbage Tree Road, Williamtown*. Douglas Partners Pty Ltd: Document No. 226269.00.R.002.Rev0.

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM].* Australian Government Publishing Services Canberra: National Environment Protection Council.

NSW EPA. (2014). *Waste Classification Guidelines, Part 1: Classifying Waste.* NSW Environment Protection Authority.

NSW EPA. (2016). *Addendum to the Waste Classification Guidelines (2014) - Part 1: Classifying Waste.* NSW Environment Protection Authority.

NSW EPA. (2020). *Guidelines for Consultants Reporting on Contaminated Land.* Contaminated Land Guidelines: NSW Environment Protection Authority.

NSW EPA. (2022). *Contaminated Sites, Sampling Design Guidelines.* NSW Environment Protection Authority.

NSW EPA. (2022). *Sampling Design, Part 1: Application; Part 2: Interpretation.* NSW Environment Protection Authority.

15. Limitations

Douglas Partners Pty Ltd (Douglas) has prepared this report for this project at 103 Cabbage Tree Road, Williamtown with reference to Douglas' proposal 226269.01.P.001.Rev0 dated 14 February 2024 and 226269.01.P.002.Rev0 dated 28 March 2024 acceptance received from Hive Battery Developments Pty Ltd dated 2 February 2024 and 29 Mach 2024 respectively. The work was carried out under Douglas' Engagement Terms. This report is provided for the exclusive use of Hive Battery Developments Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of Douglas, does so entirely at its own risk and without recourse to Douglas for any loss or damage. In preparing this report Douglas has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific sampling and/or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after Douglas' field testing has been completed.

Douglas' advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by Douglas in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

Asbestos has not been detected by observation and by laboratory analysis, either on the surface of the site, or in fill materials at the test locations sampled and analysed. Building demolition materials, such as tile, brick, concrete, ceramic, metal however, were located in below-ground fill and these are considered as indicative of the possible presence of additional hazardous building materials (HBM), including asbestos.

Although the sampling plan adopted for this investigation is considered appropriate to achieve the stated project objectives, there are necessarily parts of the site that have not been sampled and analysed. This is either due to undetected variations in ground conditions or to budget constraints (as discussed above), or to parts of the site being inaccessible and not available for inspection/sampling (i.e. beneath existing building). It is therefore considered possible that HBM, including asbestos, may be present in unobserved or untested parts of the site, between and beyond sampling locations, and hence no warranty can be given that asbestos is not present.

The assessment of atypical safety hazards arising from this advice is restricted to the environmental components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be provided, detailed 'safety in design' assessment is outside the current scope of this report and requires additional project data and assessment.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. Douglas cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by Douglas. This is because this report has been written as advice and opinion rather than instructions for construction.

Appendix A

Drawing 1 – Test Location Plan

Proposed Development Drawing (HDB, Project 23003 (Bess), Drawing 2, Rev G)

Site Location

Legend

- Approximate lot boundary
- Site boundary
- Approximate former building footprint location
- Watercourses
- Proposed development features
- Approximate borehole location
- Approximate test pit location

0 25 50 75 m

NOTE:
1. Drawing adapted from aerial imagery from "Metromap" dated 10 September 2023.
2. Test locations are approximate only and were located using differential GPS typically accurate to ± 0.1 m depending on satellite coverage.

Douglas PARTNERS

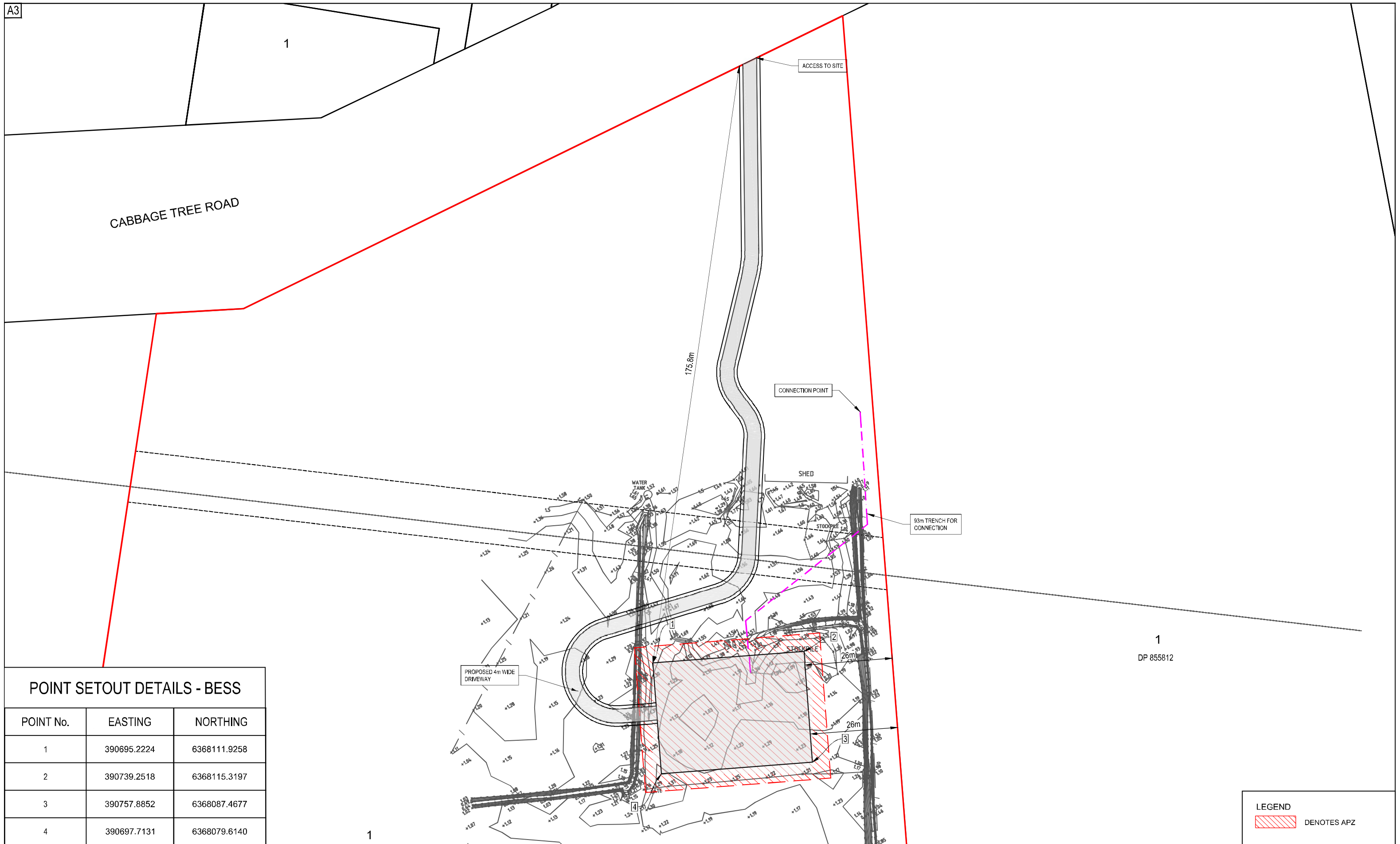
CLIENT: Hive Battery Development Pty Ltd		
OFFICE: Newcastle	DRAWN BY: JCL	
SCALE: 1:1000 @A3	DATE: 17.May.2024	

TITLE: **Test Location Plan**
Proposed battery energy storage system (BESS)
103 Cabbage Tree Road, Williamtown NSW

N

Project:	226269.01
DRAWING No:	R.002.D.001
REVISION:	0

A3



POINT SETOUT DETAILS - BESS

POINT No.	EASTING	NORTHING
1	390695.2224	6368111.9258
2	390739.2518	6368115.3197
3	390757.8852	6368087.4677
4	390697.7131	6368079.6140

LEGEND

DENOTES APZ

REV	DATE	DESCRIPTION	INITIAL	APPR.
G	17/11/23	DRIVEWAY	P.C	R.F
F	25/10/23	DRIVEWAY POSITION	P.C	R.F
E	25/10/23	MOVE PAD	P.C	R.F
D	09/10/23	GROUND SURVEY GDA 2020	S.S	R.F.
C	08/08/23	PAD LEVELS	R.F.	R.F.
B	14/02/23	REVISED ISSUE	S.B.	R.F
A	09/02/23	PRELIMINARY ISSUE	S.B.	R.F

DIAL 1100 BEFORE YOU DIG

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ABN 35 078 017 508

SURVEY BY:
DATUM : AHD
REDUCED LEVEL :
ORIGIN OF LEVELS :
CONTOUR INTERVAL:
DESIGNED: R.F. DRAWN: S.B.
CHECKED: R.F. APPROVED: R.F.

CLIENT
CLEAN ENERGY TRANSFER FUND PTY LTD

PLAN: 1:1000 @ A3
LONGITUDINAL SECTION : HORIZ. N/A VERT. N/A
CROSS SECTION : HORIZ. N/A VERT. N/A

N

PROJECT
PROPOSED BATTERY ENERGY STORAGE SYSTEM
LOT 1 DP 996491
103 CABBAGE TREE ROAD, WILLIAMTOWN

DRAWING TITLE
DETAILED SITE PLAN

SHEET 3 OF 3 SHEETS

HDB Job No 23003
REVISION G
DWG No 23003 [BESS] - 3

DA ISSUE

10 0 10 20 30
1:1000 @ A3

Appendix B

About This Report

About this Report

November 2023

Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

continued next page

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

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Terminology, Symbols and Abbreviations

November 2023

Introduction to Terminology, Symbols and Abbreviations

Douglas Partners' reports, investigation logs, and other correspondence may use terminology which has quantitative or qualitative connotations. To remove ambiguity or uncertainty surrounding the use of such terms, the following sets of notes pages may be attached Douglas Partners' reports, depending on the work performed and conditions encountered:

- Soil Descriptions;
- Rock Descriptions; and
- Sampling, insitu testing, and drilling methodologies

In addition to these pages, the following notes generally apply to most documents.

Abbreviation Codes

Site conditions may also be presented in a number of different formats, such as investigation logs, field mapping, or as a written summary. In some of these formats textual or symbolic terminology may be presented using textual abbreviation codes or graphic symbols, and, where commonly used, these are listed alongside the terminology definition. For ease of identification in these note pages, textual codes are presented in these notes in the following style `XW`. Code usage conforms with the following guidelines:

- Textual codes are case insensitive, although herein they are generally presented in upper case; and
- Textual codes are contextual (i.e. the same or similar combinations of characters may be used in different contexts with different meanings (for example `PL` is used for plastic limit in the context of soil moisture condition, as well as in `PL(A)` for point load test result in the testing results column)).

Data Integrity Codes

Subsurface investigation data recorded by Douglas Partners is generally managed in a highly structured database environment, where records "span" between a top and bottom depth interval. Depth interval "gaps" between records are considered to introduce ambiguity, and, where appropriate, our practice guidelines may require contiguous data sets. Recording meaningful data is not always appropriate (for example assigning a "strength" to a concrete pavement) and the following codes may be used to maintain contiguity in such circumstances.

Term	Description	Abbreviation Code
Core loss	No core recovery	`KL`
Unknown	Information was not available to allow classification of the property. For example, when auguring in loose, saturated sand auger cuttings may not be returned.	`UK`
No data	Information required to allow classification of the property was not available. For example, if drilling is commenced from the base of a hole predrilled by others	`ND`
Not Applicable	Derivation of the properties not appropriate or beyond the scope of the investigation. For example, providing a description of the strength of a concrete pavement	`NA`

Graphic Symbols

Douglas Partners' logs contain a "graphic" column which provides a pictorial representation of the basic composition of the material. The symbols used are directly representing the material name stated in the adjacent "Description of Strata" column, and as such no specific graphic symbology legend has been provided in these notes.

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Soil Descriptions

Terminology
Symbols
Abbreviations

November 2023

Introduction

All materials which are not considered to be "in-situ rock" are described in general accordance with the soil description model of AS 1726-2017 Part 6.1.3, and can be broken down into the following description structure:

The "classification" comprises a two character "group symbol" providing a general summary of dominant soil characteristics. The "name" summarises the particle sizes within the soil which most influence its behaviour. The detailed description presents more information about composition, condition, structure, and origin of the soil.

Classification, naming and description of soils require the relative proportion of particles of different sizes within the whole soil mixture to be considered.

Particle size designation and Behaviour Model

Solid particles within a soil are differentiated on the basis of size.

The engineering behaviour properties of a soil can subsequently be modelled to be either "fine grained" (also known as "cohesive" behaviour) or "coarse grained" ("non cohesive" behaviour), depending on the relative proportion of fine or coarse fractions in the soil mixture.

Particle Size Designation	Particle Size (mm)	Behaviour Model	
		Behaviour	Approximate Dry Mass
Boulder	>200	Excluded from particle behaviour model as "oversize"	
Cobble	63 - 200		
Gravel[1]	2.36 - 63	Coarse	>65%
Sand[1]	0.075 - 2.36		
Silt	0.002 - 0.075	Fine	>35%
Clay	<0.002		

[1] – refer grain size subdivision descriptions below

The behaviour model boundaries defined above are not precise, and the material behaviour should be assumed from the name given to the material (which considers the particle fraction which dominates the behaviour, refer "component proportions" below), rather than strict observance of the proportions of particle sizes. For example, if a material is named a "Sandy CLAY", this is indicative that the material exhibits fine grained behaviour, even if the dry mass of coarse grained material may exceed 65%.

Component proportions

The relative proportion of the dry mass of each particle size fraction is assessed to be a "primary", "secondary", or "minor" component of the soil mixture, depending on its influence over the soil behaviour.

Component Proportion Designation	Definition[1]	Relative Proportion	
		In Fine Grained Soil	In Coarse Grained Soil
Primary	The component (particle size designation, refer above) which dominates the engineering behaviour of the soil	The clay/silt component with the greater proportion	The sand/gravel component with the greater proportion
Secondary	Any component which is not the primary, but is significant to the engineering properties of the soil	Any component with greater than 30% proportion	Any granular component with greater than 30%; or Any fine component with greater than 12%
Minor[2]	Present in the soil, but not significant to its engineering properties	All other components	All other components

[1] As defined in AS1726-2017 6.1.4.4

[2] In the detailed material description, minor components are split into two further sub-categories. Refer "identification of minor components" below.

Composite Materials

In certain situations, a lithology description may describe more than one material, for example, collectively describing a layer of interbedded sand and clay. In such a scenario, the two materials would be described independently, with the names preceded or followed by a statement describing the arrangement by which the materials co-exist. For example, "INTERBEDDED Silty CLAY AND SAND".

Classification

The soil classification comprises a two character group symbol. The first character identifies the primary component. The second character identifies either the grading or presence of fines in a coarse grained soil, or the plasticity in a fine grained soil. Refer AS1726-2017 6.1.6 for further clarification.

Soil Name

For most soils, the name is derived with the primary component included as the noun (in upper case), preceded by any secondary components stated in an adjective form. In this way, the soil name also describes the general composition and indicates the dominant behaviour of the material.

Component [1]	Prominence in Soil Name
Primary	Noun (eg "CLAY")
Secondary	Adjective modifier (eg "Sandy")
Minor	No influence

[1] – for determination of component proportions, refer component proportions on previous page

For materials which cannot be disaggregated, or which are not comprised of rock or mineral fragments, the names "ORGANIC MATTER" or "ARTIFICIAL MATERIAL" may be used, in accordance with AS1726-2017 Table 14.

Commercial or colloquial names are not used for the soil name where a component derived name is possible (for example "Gravelly SAND" rather than "CRACKER DUST").

Materials of "fill" or "topsoil" origin are generally assigned a name derived from the primary/secondary component (where appropriate). In log descriptions this is preceded by uppercase "FILL" or "TOPSOIL". Origin uncertainty is indicated in the description by the characters (?), with the degree of uncertainty described (using the terms "probably" or "possibly" in the origin column, or at the end of the description).

Identification of minor components

Minor components are identified in the soil description immediately following the soil name. The minor component fraction is usually preceded with a term indicating the relative proportion of the component.

Minor Component Proportion Term	Relative Proportion	
	In Fine Grained Soil	In Coarse Grained Soil
With	All fractions: 15-30%	Clay/silt: 5-12% sand/gravel: 15-30%
Trace	All fractions: 0-15%	Clay/silt: 0-5% sand/gravel: 0-15%

The terms "with" and "trace" generally apply only to gravel or fine particle fractions. Where cobbles/boulders are encountered in minor proportions (generally less than about 12%) the term "occasional" may be used. This term describes the sporadic distribution of the material within the confines of the investigation excavation only, and there may be considerable variation in proportion over a wider area which is difficult to factually characterise due to the relative size of the particles and the investigation methods.

Soil Composition

Plasticity

Descriptive Term	Laboratory liquid limit range	
	Silt	Clay
Non-plastic materials	Not applicable	Not applicable
Low plasticity	≤50	≤35
Medium plasticity	Not applicable	>35 and ≤50
High plasticity	>50	>50

Note, Plasticity descriptions generally describe the plasticity behaviour of the whole of the fine grained soil, not individual fine grained fractions.

Grain Size

Type		Particle size (mm)
Gravel	Coarse	19 - 63
	Medium	6.7 - 19
	Fine	2.36 – 6.7
Sand	Coarse	0.6 - 2.36
	Medium	0.21 - 0.6
	Fine	0.075 - 0.21

Grading

Grading Term	Particle size (mm)
Well	A good representation of all particle sizes
Poorly	An excess or deficiency of particular sizes within the specified range
Uniformly	Essentially of one size
Gap	A deficiency of a particular size or size range within the total range

Note, AS1726-2017 provides terminology for additional attributes not listed here.

Soil Condition

Moisture

The moisture condition of soils is assessed relative to the plastic limit for fine grained soils, while for coarse grained soils it is assessed based on the appearance and feel of the material. The moisture condition of a material is considered to be independent of stratigraphy (although commonly these are related), and this data is presented in its own column on logs.

Applicability	Term	Tactile Assessment	Abbreviation code
Fine	Dry of plastic limit	Hard and friable or powdery	w<PL
	Near plastic limit	Can be moulded	w=PL
	Wet of plastic limit	Water residue remains on hands when handling	w>PL
	Near liquid limit	"oozes" when agitated	w=LL
	Wet of liquid limit	"oozes"	w>LL
Coarse	Dry	Non-cohesive and free running	D
	Moist	Feels cool, darkened in colour, particles may stick together	M
	Wet	Feels cool, darkened in colour, particles may stick together, free water forms when handling	W

The abbreviation code NDF, meaning "not-assessable due to drilling fluid use" may also be used.

Note, observations relating to free ground water or drilling fluids are provided independent of soil moisture condition.

Consistency/Density/Compaction/Cementation/Extremely Weathered Material

These concepts give an indication of how the material may respond to applied forces (when considered in conjunction with other attributes of the soil). This behaviour can vary independent of the composition of the material, and on logs these are described in an independent column and are generally mutually exclusive (i.e it is inappropriate to describe both consistency and compaction at the same time). The method by which the behaviour is described depends on the behaviour model and other characteristics of the soil as follows:

- In fine grained soils, the "consistency" describes the ease with which the soil can be remoulded, and is generally correlated against the materials undrained shear strength;
- In granular materials, the relative density describes how tightly packed the particles are, and is generally correlated against the density index;
- In anthropogenically modified materials, the compaction of the material is described qualitatively;
- In cemented soils (both natural and anthropogenic), the cemented "strength" is described qualitatively, relative to the difficulty with which the material is disaggregated; and
- In soils of extremely weathered material origin, the engineering behaviour may be governed by relic rock features, and expected behaviour needs to be assessed based the overall material description.

Quantitative engineering performance of these materials may be determined by laboratory testing or estimated by correlated field tests (for example penetration or shear vane testing). In some cases, performance may be assessed by tactile or other subjective methods, in which case investigation logs will show the estimated value enclosed in round brackets, for example (VS).

Consistency (fine grained soils)

Consistency Term	Tactile Assessment	Undrained Shear Strength (kPa)	Abbreviation Code
Very soft	Extrudes between fingers when squeezed	<12	VS
Soft	Mouldable with light finger pressure	>12 - ≤25	S
Firm	Mouldable with strong finger pressure	>25 - ≤50	F
Stiff	Cannot be moulded by fingers	>50 - ≤100	St
Very stiff	Indented by thumbnail	>100 - ≤200	VSt
Hard	Indented by thumbnail with difficulty	>200	H
Friable	Easily crumbled or broken into small pieces by hand	-	Fr

Relative Density (coarse grained soils)

Relative Density Term	Density Index	Abbreviation Code
Very loose	<15	VL
Loose	>15 - ≤35	L
Medium dense	>35 - ≤65	MD
Dense	>65 - ≤85	D
Very dense	>85	VD

Note, tactile assessment of relative density is difficult, and generally requires penetration testing, hence a tactile assessment guide is not provided.

Compaction (anthropogenically modified soil)

Compaction Term	Abbreviation Code
Well compacted	WC
Poorly compacted	PC
Moderately compacted	MC
Variably compacted	VC

Cementation (natural and anthropogenic)

Cementation Term	Abbreviation Code
Moderately cemented	MOD
Weakly cemented	WEK

Extremely Weathered Material

AS1726-2017 considers weathered material to be soil if the unconfined compressive strength is less than 0.6 MPa (i.e. less than very low strength rock). These materials may be identified as "extremely weathered material" in reports and by the abbreviation code XWM on log sheets. This identification is not correlated to any specific qualitative or quantitative behaviour, and the engineering properties of this material must therefore be assessed according to engineering principles with reference to any relic rock structure, fabric, or texture described in the description.

Soil Origin

Term	Description	Abbreviation Code
Residual	Derived from in-situ weathering of the underlying rock	RS
Extremely weathered material	Formed from in-situ weathering of geological formations. Has strength of less than 'very low' as per as1726 but retains the structure or fabric of the parent rock.	XWM
Alluvial	Deposited by streams and rivers	ALV
Estuarine	Deposited in coastal estuaries	EST
Marine	Deposited in a marine environment	MAR
Lacustrine	Deposited in freshwater lakes	LAC
Aeolian	Carried and deposited by wind	AEO
Colluvial	Soil and rock debris transported down slopes by gravity	COL
Slopewash	Thin layers of soil and rock debris gradually and slowly deposited by gravity and possibly water	SW
Topsoil	Mantle of surface soil, often with high levels of organic material	TOP
Fill	Any material which has been moved by man	FILL
Littoral	Deposited on the lake or seashore	LIT
Unidentifiable	Not able to be identified	UID

Cobbles and Boulders

The presence of particles considered to be "oversize" may be described using one of the following strategies:

- Oversize encountered in a minor proportion (when considered relative to the wider area) are noted in the soil description; or
- Where a significant proportion of oversize is encountered, the cobbles/boulders are described independent of the soil description, in a similar manner to composite soils (described above) but qualified with "MIXTURE OF".

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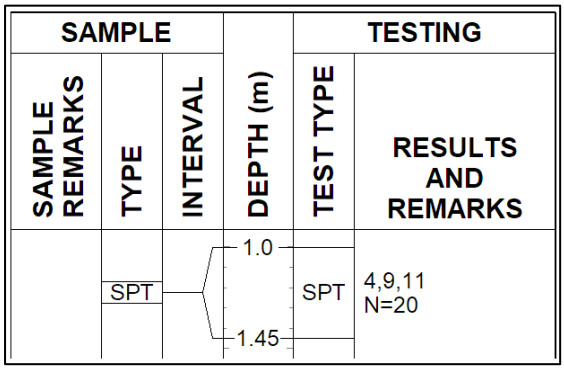
Sampling, Testing and Excavation Methodology

Terminology
Symbols
Abbreviations

November 2023

Sampling and Testing

A record of samples retained, and field testing performed is usually shown on a Douglas Partners' log with samples appearing to the left of a depth scale, and selected field and laboratory testing (including results, where relevant) appearing to the right of the scale, as illustrated below:



Sampling

The type or intended purpose for which a sample was taken is indicated by the following abbreviation codes.

Sample Type	Code
Auger sample	A
Bulk sample	B
Core sample	C
Disturbed sample	D
Sample from SPT test	SPT
Environmental sample	ES
Gas sample	G
Undisturbed tube sample	U[1]
Water sample	W
Piston sample	P
Core sample for unconfined compressive strength testing	UCS
Material Sample	MT

[1] – numeric suffixes indicate tube diameter/width in mm

The above codes only indicate that a sample was retained, and not that testing was scheduled or performed.

Field and Laboratory Testing

A record that field and laboratory testing was performed is indicated by the following abbreviation codes.

Test Type	Code
Pocket penetrometer (kPa)	PP
Photo ionisation detector (ppm)	PID
Standard Penetration Test x/y =x blows for y mm penetration HB = hammer bouncing HW = fell under weight of hammer	SPT
Shear vane (kPa)	V
Unconfined compressive strength, (MPa)	UCS

Field and laboratory testing (continued)

Test Type	Code
Point load test, (MPa), axial (A), diametric (D), irregular (I)	PLT(_)
Dynamic cone penetrometer, followed by blow count penetration increment in mm (cone tip, generally in accordance with AS1289.6.3.2)	DCP/150
Perth sand penetrometer, followed by blow count penetration increment in mm (flat tip, generally in accordance with AS1289.6.3.3)	PSP/150

Groundwater Observations

▷	seepage/inflow
▽	standing or observed water level
NFGWO	no free groundwater observed
OBS	observations obscured by drilling fluids

Drilling or Excavation Methods/Tools

The drilling/excavation methods used to perform the investigation may be shown either in a dedicated column down the left-hand edge of the log, or stated in the log footer. In some circumstances abbreviation codes may be used.

Method	Abbreviation Code
Toothed bucket	TB[1]
Mud/blade bucket	MB[1]
Ripping tyne/ripper	R
Rock breaker/hydraulic hammer	RB
Hand auger	HA[1]
NMLC series coring	NMLC
HMLC series coring	HMLC
NQ coring	NQ3
HQ coring	HQ3
PQ coring	PQ3
Push tube	PT[1]
Rock roller	RR[1]
Solid flight auger. Suffixes: /T = tungsten carbide tip, /V = v-shaped tip	AD[1]
Sonic drilling	SON[1]
Vibrocore	VC[1]
Wash bore (unspecified bit type)	WB[1]
Existing exposure	X
Hand tools (unspecified)	HAND
Predrilled	PD
Diatube	DT[1]
Hollow flight auger	HSA[1]
Vacuum excavation	VE

[1] – numeric suffixes indicate tool diameter/width in mm

Douglas PARTNERS

Appendix C

Data Quality Objectives

1. Data Quality Objectives

The DSI has been devised broadly in accordance with the seven-step data quality objectives (DQO) process which is provided in Appendix B, Schedule B2 of NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013).

Table 1: Data quality objectives

Step	Summary
1: State the problem	The objective of the investigation is to confirm the contamination status of the site with respect to the proposed land use. The report is being undertaken as the land is to be redeveloped. A preliminary conceptual site model (CSM) has been prepared for the proposed development. The project team consisted of experienced environmental engineers and scientists working in the roles of Project Principal, Project Reviewer, Project Manager, field staff.
2: Identify the decisions / goal of the study	The site history has identified possible contaminating previous uses which are identified in the CSM. The CSM identifies the associated contaminants of potential concern (CoPC) and the likely impacted media. The site assessment criteria (SAC) for each of the CoPC are detailed in Appendix E. The decision is to establish whether or not the results fall below the SAC or whether or not the 95% upper confidence limit of the sample population falls below the SAC. On this basis, an assessment of the site's suitability from a contamination perspective will be derived and a decision made on whether (or not) further assessment and / or remediation will be required.
3: Identify the information inputs	Inputs to the investigation will be the results of analysis of samples to measure the concentrations of CoPC identified in the CSM at the site using NATA accredited laboratories and methods, where possible. The SAC for each of the CoPC are detailed in Appendix E. A photoionisation detector (PID) will be used on-site to screen soils for VOC. PID readings will be used to inform sample selection for laboratory analysis.
4: Define the study boundaries	The lateral boundaries of the investigation area are shown on Drawing 1, Appendix A. The vertical boundaries are to the extent of contamination impact as determined from the site history assessment and site observations. The assessment is limited to the timeframe over which the field investigation was undertaken. Constraints to the assessment are identified and discussed in the conclusions of the DSI report.

Step	Summary
5: Develop the analytical approach (or decision rule)	The decision rule is to compare all analytical results with SAC (Appendix E, based on NEPC (2013)). Where guideline values are absent, other sources of guideline values accepted by NEPC (2013) shall be adopted where possible. Where a sample result exceeds the adopted criterion, a further site-specific assessment will be made as to the risk posed by the presence of that contaminant(s). Initial comparisons will be with individual results then, where required, summary statistics (including mean, standard deviation and 95% upper confidence limit (UCL) of the arithmetic mean (95% UCL)) to assess potential risks posed by the site contamination. Quality control results are to be assessed according to their relative percent difference (RPD) values. For field duplicates, triplicates and laboratory results, RPDs should generally be below 30%; for field blanks and rinsates, results should be at or less than the limits of reporting (NEPC, 2013). The field and laboratory quality assurance assessment is included in Appendix H.
6: Specify the performance or acceptance criteria	**Baseline condition**: Contaminants at the site and/or statistical analysis of data (in line with NEPC (2013)) exceed human health and environmental SAC and pose a potentially unacceptable risk to receptors (null hypothesis). **Alternative condition**: Contaminants at the site and statistical analysis of data (in line with NEPC (2013)) comply with human health and environmental SAC and as such, do not pose a potentially unacceptable risk to receptors (alternative hypothesis). Unless conclusive information from the collected data is sufficient to reject the null hypothesis, it is assumed that the baseline condition is true. Uncertainty that may exist due to the above potential decision errors shall be mitigated as follows: • As well as a primary screening exercise, the use of the 95% UCL as per NEPC (2013) may be applied, i.e.: 95% is the defined confidence level associated with the UCL on the geometric mean for contaminant data. The resultant 95% UCL shall subsequently be screened against the corresponding SAC. The statistical assessment will only be able to be applied to certain data-sets, such as those obtained via systematic sampling. Identification of areas for targeted sampling will be via professional judgement and errors will not be able to have a probability assigned to them.
7: Optimise the design for obtaining data	As the purpose of the sampling program is to assess for potential contamination across the site, the sampling program is reliant on professional judgement to identify and sample the potentially affected areas. Further details regarding the proposed sampling plan are presented in the SAQP within the DSI report.

2. Reference

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]*. Australian Government Publishing Services Canberra: National Environment Protection Council.

Appendix D

Field Work Methodology

1. Guidelines

The following key guidelines were consulted for the field work methodology:

- NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013).
- HEPA *PFAS National Environmental Management Plan (NEMP)* (HEPA, 2020).

2. Soil Sampling

Soil sampling is carried out in accordance with Douglas' standard operating procedures. The general sampling and sample management procedures comprise:

- Collect soil samples directly from the excavator, hand tools or excavator bucket at the nominated sample depth;
- Collect near surface samples using hand tools;
- Transfer samples in laboratory-prepared glass jars with Teflon lined lids by hand, capping immediately and minimising headspace within the sample jar;
- Transfer samples in laboratory-prepared container (specific for PFAS) by hand, capping immediately and minimising headspace within the sample jar;
- Collect replicate samples in zip-lock bags for photoionisation detector (PID) screening;
- Collect ~500 ml samples for fibrous asbestos and asbestos fines (FA and AF) analysis;
- Wear a new disposable nitrile glove for each sample point thereby minimising potential for cross-contamination;
- Collect 10% replicate samples for quality control (QC) purposes;
- Label sample containers with individual and unique identification details, including project number, sample location and sample depth (where applicable); and
- Place samples into a cooled, insulated and sealed container for transport to the laboratory;
- Use chain of custody documentation.

Reference was made to HEPA (2020) for requirements specific to PFAS.

2.1 Field testing

Field testing is carried out in accordance with Douglas' standard operating procedures. The general sampling and sample management procedures comprise:

PID Field Test

- Calibrate the PID with isobutylene gas at 100 ppm and with fresh air prior to commencement of each successive day's field work;
- Allow the headspace in the PID zip-lock bag samples to equilibrate; and
- Screen using the PID.

3. Groundwater Sampling

3.1 Monitoring Well Installation

Monitoring wells are constructed using class 18 uPVC machine slotted screen and blank sections with screw threaded joints. The screened section of each well is backfilled with a washed sand filter pack to approximately 0.0 to 0.3 m above the screened interval. Each well is completed with a hydrated bentonite plug of at least 0.3 to 0.5 m thick and then compacted drill cuttings to the surface, finished as a lockable above ground steel monument set in a concrete plinth.

3.2 Monitoring Well Development

Groundwater monitoring wells are developed as soon as practicable following well installation. The purpose of well development is to remove sediments and/or drilling fluid introduced to the well during drilling and to facilitate connection of the monitoring well to the aquifer. The wells are developed by pumping / bailing to remove a minimum of five well volumes, or until dry.

3.3 Groundwater Sampling

Groundwater sampling is carried out in accordance with Douglas' standard operating procedures. Groundwater samples are collected using a positive displacement low flow bladder pump via the micro-purge (minimal drawdown) method. The method minimises aeration of the sample and disturbance to the water column thereby enhancing the quality of results for oxygen sensitive analytes. The sampling method is described as follows:

- Measure the static water level using an electronic interface probe and record the thickness of any LNAPL (if encountered);
- Decontaminate the interface probe and cable between monitoring wells by rinsing in a diluted Liquinox solution and then rinsing in demineralised water;
- Fit the pump with a well-dedicated bladder and tubing. Lower the pump into the well then clamp at a level estimated to be 1 m below the top of the water column (provided the depth of the pump is within the screened section) or to the approximate mid-point of the well screen;
- Set the pump at the lowest rate possible that could produce laminar flow to minimise drawdown of the water column;
- Measure physical parameters by continuously passing the purged water through a flow cell; and
- Following stabilisation of the field parameters, collect samples in laboratory-prepared bottles minimising headspace within the sample bottle and cap immediately. Field filtering of collected groundwater samples for preservation (where required).

Sample Handling, All Methods

The general groundwater sample handling and management procedures comprise:

- Collect 10% replicate samples for QC purposes;
- Label sample containers with individual and unique identification details, including project number and sample location;

- Place the sample jars into a cooled, insulated and sealed container for transport to the laboratory; and
- Use chain of custody documentation.

4. References

HEPA. (2020). *PFAS National Environmental Management Plan (NEMP).* Version 2.0: Heads of EPAs Australia and New Zealand and Australian Government Department of the Environment.

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM].* Australian Government Publishing Services Canberra: National Environment Protection Council.

Appendix E

Site Assessment Criteria

1. Introduction

1.1 Guidelines

The following key guidelines were consulted for deriving the site assessment criteria (SAC):

- NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013).
- CRC CARE *Health screening levels for petroleum hydrocarbons in soil and groundwater* (CRC CARE, 2011).
- HEPA *PFAS National Environmental Management Plan (NEMP)* (HEPA, 2020).
- ANZG *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZG, 2018).
- NHMRC *Guidelines for Managing Risks In Recreational Water* (NHMRC, 2008).

1.2 General

The SAC applied in the current investigation are informed by the CSM which identified human and environmental receptors to potential contamination at the site. Analytical results are assessed (as a Tier 1 assessment) against the SAC comprising primarily the investigation and screening levels of Schedule B1 of NEPC (2013).

The following inputs are relevant to the selection and/or derivation of the SAC for the proposed development:

- Land use: industrial.
    - Corresponding to land use category 'D', commercial / industrial such as shops, offices, factories and industrial sites.
- Soil type: sand / silt / clay.

It is noted that vapour intrusion risks for the development are likely to be negligable given the proposed development (i.e. likely granular fill platform with no enclosed buildings). Health screening levels (HSLs) for vapour intrusion, however, have been provided below for completeness.

2. Soils

2.1 Health Investigation And Screening Levels

The generic health investigation levels (HIL) and health screening levels (HSL) are considered to be appropriate for the assessment of human health risk via all relevant pathways of exposure associated with contamination at the site. The adopted soil HIL and HSL for the contaminants of concern are in Table 1 and Table 2.

Table 1: Health Investigation Levels (mg/kg)

Contaminant	HIL-D
Metals	
Arsenic	3000
Beryllium	500
Boron	300 000
Cadmium	900
Chromium (VI)	3600
Copper	240 000
Lead	1500
Manganese	60 000
Mercury (inorganic)	730
Nickel	6000
Selenium	10 000
Zinc	400 000
PAH	
B(a)P TEQ	40
Total PAH	4000
Phenols	
Phenol	240 000
Pentachlorophenol	660
OCP	
DDT+DDE+DDD	3600
Aldrin and dieldrin	45
Chlordane	530
Endosulfan	2000
Endrin	100
Heptachlor	50
HCB	80
Methoxychlor	2500
Mirex	100
OPP	
Chlorpyrifos	2000
PCB	
PCB	7

Table 2: Health Screening Levels (mg/kg)

Contaminant	HSL-D	HSL-D	HSL-D	HSL-D
SAND	**0 m to <1 m**	**1 m to <2 m**	**2 m to <4 m**	**4 m+**
Benzene	3	3	3	3
Toluene	NL	NL	NL	NL
Ethylbenzene	NL	NL	NL	NL
Xylenes	230	NL	NL	NL
Naphthalene	NL	NL	NL	NL
TRH F1	260	370	630	NL
TRH F2	NL	NL	NL	NL
SILT	**0 m to <1 m**	**1 m to <2 m**	**2 m to <4 m**	**4 m+**
Benzene	4	4	6	10
Toluene	NL	NL	NL	NL
Ethylbenzene	NL	NL	NL	NL
Xylenes	NL	NL	NL	NL
Naphthalene	NL	NL	NL	NL
TRH F1	250	360	590	NL
TRH F2	NL	NL	NL	NL
CLAY	**0 m to <1 m**	**1 m to <2 m**	**2 m to <4 m**	**4 m+**
Benzene	4	6	9	20
Toluene	NL	NL	NL	NL
Ethylbenzene	NL	NL	NL	NL
Xylenes	NL	NL	NL	NL
Naphthalene	NL	NL	NL	NL
TRH F1	310	480	NL	NL
TRH F2	NL	NL	NL	NL

Notes: TRH F1 is TRH C_6-C_{10} minus BTEX
TRH F2 is TRH >C_{10}-C_{16} minus naphthalene
The soil saturation concentration (Csat) is defined as the soil concentration at which the porewater phase cannot dissolve any more of an individual chemical. The soil vapour that is in equilibrium with the porewater will be at its maximum. If the derived soil HSL exceeds Csat, a soil vapour source concentration for a petroleum mixture could not exceed a level that would results in the maximum allowable vapour risk for the given scenario. For these scenarios, no HSL is presented for these chemicals and the HSL is shown as 'not limiting' or 'NL'

The HSL for direct contact derived from CRC CARE (2011) are in Table 3.

Table 3: Health Screening Levels for Direct Contact (mg/kg)

Contaminant	DC HSL-D	DC HSL-IMW
Benzene	430	1100
Toluene	99 000	120 000
Ethylbenzene	27 000	85 000
Xylenes	81 000	130 000
Naphthalene	11 000	29 000
TRH F1	26 000	82 000
TRH F2	20 000	62 000
TRH F3	27 000	85 000
TRH F4	38 000	120 000

Notes: TRH F1 is TRH C_6-C_{10} minus BTEX
TRH F2 is TRH >C_{10}-C_{16} minus naphthalene
IMW intrusive maintenance worker

2.2 Health Investigation Levels For Per-And Poly-Fluoroalkyl Substances In Soil

The laboratory analytical results for per- and poly-fluoroalkyl substances (PFAS) in soil have been assessed against HIL published in HEPA (2020). The HIL represent a nationally-agreed suite that should be used to inform site investigations. The HIL are intentionally conservative, and an exceedance of these criteria may not constitute a risk if other exposure pathways are controlled. An exceedance of the HIL should trigger further investigations, such as a site-specific risk assessment. At the time of this investigation, screening values were available only for perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA) and perfluorohexane sulfonate (PFHxS).

The HIL derived from Table 2 of HEPA (2020) are in Table 4.

Table 4: Health Investigation Levels (mg/kg)

Contaminant	HIL-D
PFOS and PFHxS *	20
PFOA	50

Notes: * Includes PFOS only, PFHxS only and the sum of the two.

2.3 Asbestos in Soil

The HSL for asbestos in soil are based on likely exposure levels for different scenarios published in NEPC (2013) for the following forms of asbestos:

- Bonded asbestos containing material (ACM); and
- Fibrous asbestos and asbestos fines (FA and AF).

The HSL are in Table 5.

Table 5: Health Screening Levels For Asbestos

Form of asbestos	HSL-D
ACM	0.05%
FA and AF	0.001%
FA and AF and ACM	No visible asbestos for surface soil *

Notes: Surface soils defined as top 10 cm.
* Based on site observations at the sampling points and the analytical results of surface samples.

2.4 Ecological Investigation Levels

Ecological investigation levels (EIL) and added contaminant limits (ACL), where appropriate, have been derived in NEPC (2013) for arsenic, copper, chromium (III), nickel, lead, zinc, DDT and naphthalene. The adopted EIL, derived using the interactive (excel) calculation spreadsheet on the NEPM toolbox website are shown in Table 7, with inputs into their derivation shown in Table 6.

Table 6: Inputs To The Derivation Of The Ecological Investigation Levels

Variable	Input	Rationale
Age of contaminants	"Aged" (>2 years)	Identified sources of contamination are likely >2years old
pH	4.4	Minimum result from testing
CEC	9.4 $cmol_c/kg$	Minimum result from testing
Clay content	5%	Conservative value given predominantly clayey soils
Traffic volumes	High	Developed site
State / Territory	NSW	Site Location

Table 7: Ecological Investigation Levels (mg/kg)

Contaminant	EIL-D
Metals	
Arsenic	160
Copper	110
Nickel	250
Chromium III	330
Lead	1800
Zinc	300
PAH	
Naphthalene	370
OCP	
DDT	640

2.5 Ecological screening levels

Ecological screening levels (ESL) are used to assess the risk of selected petroleum hydrocarbon compounds, BTEX and benzo(a)pyrene to terrestrial ecosystems. The adopted ESL are shown in Table 8.

Table 8: Ecological Screening Levels (mg/kg)

Contaminant	Soil Type	ESL-D
Benzene	Coarse	75
Toluene	Coarse	135
Ethylbenzene	Coarse	165
Xylenes	Coarse	180
TRH F1	Coarse/ Fine	215*
TRH F2	Coarse/ Fine	170*
TRH F3	Coarse	1700
TRH F4	Coarse	3300
B(a)P	Coarse	1.4
Benzene	Fine	95
Toluene	Fine	135
Ethylbenzene	Fine	185
Xylenes	Fine	95
TRH F1	Coarse/ Fine	215*
TRH F2	Coarse/ Fine	170*
TRH F3	Fine	2500
TRH F4	Fine	6600
B(a)P	Fine	1.4

Notes: ESL are of low reliability except where indicated by * which indicates that the ESL is of moderate reliability
TRH F1 is TRH C_6-C_{10} minus BTEX
TRH F2 is TRH >C_{10}-C_{16} including naphthalene

2.6 Ecological soil guideline values

The interim ecological soil guideline values (EGV) derived from Table3 of HEPA (2020) are in Table 9.

Table 9: Ecological soil guideline values (mg/kg) – all land uses

Contaminant	Direct exposure	Indirect exposure
PFOS	1	0.01
PFOA	10	NC
PFHxS	NC	NC

Notes:
NC no criterion

2.7 Management Limits

In addition to appropriate consideration and application of the HSL and ESL, there are additional considerations which reflect the nature and properties of petroleum hydrocarbons, including:

- Formation of observable light non-aqueous phase liquids (LNAPL);
- Fire and explosion hazards;
- Effects on buried infrastructure e.g. penetration of, or damage to, in-ground services.

The adopted management limits are in Table 10.

Table 10: Management limits (mg/kg)

Contaminant	Soil type	ML-D
TRH F1	Coarse	700
TRH F2	Coarse	1000
TRH F3	Coarse	3500
TRH F4	Coarse	10 000
TRH F1	Fine	800
TRH F2	Fine	1000
TRH F3	Fine	5000
TRH F4	Fine	10 000

Notes: TRH F1 is TRH C_6-C_{10} including BTEX
TRH F2 is TRH >C_{10}-C_{16} including naphthalene

3. Groundwater

3.1 Introduction

The groundwater investigation levels (GIL) used for interpretation of the groundwater data (as a Tier 1 assessment) have been selected based on the potential risks posed from contamination sourced from the site to receptors at or down-gradient of the site, as identified by the conceptual site model (CSM). The receptors, exposure points and pathways are summarised in Table 11.

Table 11: Summary of potential receptors and potential risks

Receptor	Location	Exposure point	Exposure pathway
Surface water aquatic ecosystem	Down-gradient from site.	Receiving surface water body at the groundwater discharge point.	Exposure to contaminants.
Occupants of buildings	On site.	Enclosed buildings (existing or proposed).	Inhalation of VOC (including TRH and BTEX) overlying VOC impacted groundwater via the vapour intrusion pathway.
Human exposure during temporary trenching	On site	During trenching.	Ingestion / dermal absorption of contaminants during trenching works.
Human recreation (e.g. swimming)	Down-gradient from site.	Receiving surface water body at the groundwater discharge point.	Ingestion / dermal absorption of contaminants during recreational activities (e.g. swimming).

The site is within the RAAF Base Williamtown PFAS Primary Management Zone. Precautionary advice provided on NSW EPA website states the following:

> *Groundwater, bore water and surface water should not be used for any purpose;*
>
> *Additionally, do not do anything with groundwater, bore water or surface water (including in creeks and drains) that might lead to incidental ingestion (swallowing);*
>
> *Home grown foods produced in your area should not be consumed. This includes home-slaughtered meat, poultry, eggs, milk, fruit and vegetables.*
>
> https://www.epa.nsw.gov.au/working-together/community-engagement/updates-on-issues/raaf-williamtown-contamination/williamtown-precautionary-advice

Therefore, the following typical receptors for groundwater have been removed:

- Crops; and
- Human consumption.

The rationale for the selection of GIL is in Table 12.

Table 12: Groundwater investigation level rationale

Receptor / beneficial use	GIL	Source	Comments / rationale
Aquatic ecosystem	DGV	ANZG (2018)	Freshwater 99% LOP for bioaccumulative contaminants 95% LOP for non-bioaccumulative contaminants Marine water 99% LOP for bioaccumulative contaminants 95% LOP for non-bioaccumulative contaminants
Aquatic ecosystem	DGV	HEPA (2020)	Freshwater 99% LOP as recommended for potential bioaccumulation Screening values were only available for PFOS and PFOA at the time of this investigation.
Recreational waters	GV	NHMRC (2008)	Based on the NHMRC (2022) values x10 (lower limit of recommended 10-20x) to account for ingestion of water whilst undertaking recreational activities. In lieu of other guidance, recreational activities have been considered to be the most similar to the exposure during proposed excavation works (conservative). PFAS GV adopted as per NHMRC (2019) guidance note

Notes to table:
DGV default guideline value
% LOP percentage level of protection of species
HSL health screening level
GV guideline value
LTV long term value (up to 100 years)
STV short term value (up to 20 years)

3.2 Groundwater investigation levels for aquatic ecosystems

The DGV for the protection of aquatic ecosystems derived from ANZG (2018) are in Table 13.

Table 13: Groundwater Investigation Levels for Protection of Aquatic Ecosystems (µg/L)

Contaminant	Freshwater DGV 95% LOP*	Marine DGV 95% LOP*	Notes
Metals / metalloids			
Antimony	9	-	Freshwater: Unknown reliability.
Arsenic	24 / 13	24 / 13	Freshwater: Levels provided for As III / As IV respectively. Moderate reliability. Marine: Levels provided for As III / As IV respectively as adopted from freshwater criteria in absence of marine criteria. Unknown reliability.
Aluminium	0.8	-	Freshwater: Criteria for groundwater with pH < 6.5, unknown reliability.
Boron	940	940	Freshwater: Very high reliability. Marine: Adopted from freshwater criteria in absence of marine criteria. Unknown reliability.
Cadmium	0.2	0.7	Freshwater: Very high reliability. Marine: 99% LOP adopted as recommended due to potential for bioaccumulation. Very high reliability.
Chromium (VI)	1	4.4	Freshwater: Chromium VI levels adopted as initial screen for total chromium. Very high reliability. Marine: Chromium VI levels adopted as initial screen for total chromium. Very high reliability.
Cobalt	1.4	1	Freshwater: Unknown reliability and LOP. Marine: High reliability
Copper	1.4	1.3	Freshwater: Very high reliability. Marine: Very high reliability.
Lead	3.4	4.4	Freshwater: Moderate reliability. Marine: Low reliability.
Manganese	1900	80	Freshwater: Moderate reliability. Marine: Unknown reliability and LOP.
Mercury (inorganic)	0.06	0.1	Freshwater: 99% LOP adopted as recommended due to potential for bioaccumulation. Moderate reliability. Marine: 99% LOP adopted as recommended due to potential for bioaccumulation. Very high reliability.
Molybdenum	34	-	Freshwater: Unknown reliability.
Nickel	11	7	Freshwater: Low reliability. Marine: 99% LOP adopted as recommended to protect key species from chronic toxicity. Very high reliability.
Selenium	5	5	Freshwater: 99% LOP adopted as recommended due to potential for bioaccumulation. Moderate reliability. Marine: Adopted from freshwater criteria for in absence of marine criteria. 99% LOP adopted as recommended due to potential for bioaccumulation. Unknown reliability.
Silver	0.05	1.4	Freshwater: Low reliability Marine: Moderate reliability.
Uranium	0.5	-	Freshwater: Unknown reliability.

Contaminant	Freshwater DGV 95% LOP*	Marine DGV 95% LOP*	Notes
Zinc	8	8	Freshwater: Very high reliability. Marine: Very high reliability.
BTEX			
Benzene	950	500	Freshwater: Moderate reliability. Marine: 99% LOP adopted as recommended to protect key species from chronic toxicity. Moderate reliability.
Ethylbenzene	80	80	Freshwater: Unknown reliability. Marine: Unknown reliability.
m-Xylene	50	75	Freshwater: Unknown reliability. Marine: Unknown reliability.
o-xylene	350	350	Freshwater: Low reliability. Marine: Adopted from freshwater criteria for in absence of marine criteria. Unknown reliability.
Toluene	180	180	Freshwater: Unknown reliability. Marine: Unknown reliability.
PAH			
Anthracene	0.01	0.01	Freshwater: 99% LOP adopted as recommended due to potential for bioaccumulation. Unknown reliability. Marine: 99% LOP adopted as recommended due to potential for bioaccumulation. Unknown reliability.
Benzo(a)pyrene	0.1	0.1	Freshwater: 99% LOP adopted as recommended due to potential for bioaccumulation. Unknown reliability. Marine: 99% LOP adopted as recommended due to potential for bioaccumulation. Unknown reliability.
Fluoranthene	1	1	Freshwater: 99% LOP adopted as recommended due to potential for bioaccumulation. Unknown reliability. Marine: 99% LOP adopted as recommended due to potential for bioaccumulation. Unknown reliability.
Naphthalene	16	50	Freshwater: Low reliability. Marine: 99% LOP adopted as recommended due to potential for bioaccumulation. Moderate reliability.
Phenanthrene	0.6	0.6	Freshwater: 99% LOP adopted as recommended due to potential for bioaccumulation. Unknown reliability. Marine: 99% LOP adopted as recommended due to potential for bioaccumulation. Unknown reliability.

Notes:
* 95% LOP for non-bioaccumulative contaminants and 99% LOP for bioaccumulative contaminants

The DGV for the protection of aquatic ecosystems derived from HEPA (2020) are in Table 14.

Table 14: Groundwater Investigation Levels for Protection of Aquatic Ecosystems (µg/L)

Contaminant / LOP	Freshwater DGV	Interim Marine Water DGV
PFOS 99% LOP	0.00023	0.00023
PFOA 99% LOP	19	19

3.3 Health screening levels for vapour intrusion

The HSL to evaluate potential vapour intrusion risks derived from NEPC (2013) are in Table 15.

Table 15: Groundwater Health Screening Levels for Vapour Intrusion (µg/L)

Contaminant	HSL-D	Solubility limit
SAND	**2 m to <4 m**	**-**
Benzene	5000	59 000
Toluene	NL	61 000
Ethylbenzene	NL	3900
Xylenes	NL	21 000
Naphthalene	NL	170
TRH F1	6000	9000
TRH F2	NL	3000
SILT	**2 m to <4 m**	**-**
Benzene	30 000	59 000
Toluene	NL	61 000
Ethylbenzene	NL	3900
Xylenes	NL	21 000
Naphthalene	NL	170
TRH F1	NL	9000
TRH F2	NL	3000
CLAY	**2 m to <4 m**	**-**
Benzene	30 000	59 000
Toluene	NL	61 000
Ethylbenzene	NL	3900
Xylenes	NL	21 000
Naphthalene	NL	170
TRH F1	NL	9000
TRH F2	NL	3000

Notes: TRH F1 is TRH C_6-C_{10} minus BTEX
TRH F2 is TRH >C_{10}-C_{16} minus naphthalene
The solubility limit is defined as the groundwater concentration at which the water cannot dissolve any more of an individual chemical based on a petroleum mixture. The soil vapour that is in equilibrium with the groundwater will be at its maximum. If the derived groundwater HSL exceeds the water solubility limit, a soil vapour source concentration for a petroleum mixture could not exceed a level that would result in the maximum allowable vapour risk for the given scenario. For these scenarios, no HSL is presented for these chemicals and the HSL is shown as 'not limiting' or 'NL'.

3.4 Groundwater Investigation Levels For Recreational Water

The GV for recreational water derived from NHMRC (2008) are in Table 16.

Table 16: Groundwater Investigation Levels for Protection of Recreational Waters (µg/L)

Contaminant	Recreational Water Guideline Values
Metals / metalloids	
Arsenic	100
Barium	20000
Beryllium	600
Boron	40000
Cadmium	20
Chromium (VI)	500
Copper	20000
Lead	100
Manganese	5000
Mercury (inorganic)	10
Nickel	200
Selenium	100
BTEX	
Benzene	10
Ethylbenzene	3000
Xylenes	6000
Toluene	8000
PAH	
Benzo(a)pyrene	0.1
PFAS	
PFOS + PFHxS*	2
PFOA	10
VOC	
tetrachloroethene	500
1,1-Dichloroethene	300
1,2-dichlorobenzene	15,000
1,2-dichloroethane	30
1,4-dichlorobenzene	400
carbon tetrachloride	30
Vinyl Chloride	3
1,2-dibromoethane	10
hexachlorobutadiene	7
Bromomethane	10
Monochlorobenzene	3,000
Styrene (vinylbenzene)	300
Physical properties / aesthetics	
pH	6.5-8.5 (aesthetic only)
Dissolved oxygen	6,600 (aesthetic only)

Notes: * Includes PFOS only, PFHxS only and the sum of the two.

4. References

ANZG. (2018). *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. Canberra, ACT: Australian and New Zealand Governments and Australian state and territory governments.

CRC CARE. (2011). *Health screening levels for petroleum hydrocarbons in soil and groundwater.* Parts 1 to 3, Technical Report No. 10: Cooperative Research Centre for Contamination Assessment and Remediation of the Environment.

HEPA. (2020). *PFAS National Environmental Management Plan (NEMP).* Version 2.0: Heads of EPAs Australia and New Zealand and Australian Government Department of the Environment.

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM].* Australian Government Publishing Services Canberra: National Environment Protection Council.

NHMRC. (2008). *Guidelines for Managing Risks In Recreational Water.*

NHMRC. (2019). *Guidance on Per and Polyfluoroalkyl (PFAS) in Recreational Water.* National Health and Medical Research Council.

Warne, M., Batley, G., van Dam, R., Chapman, J., Fox, D., Hickey, C., & Stauber, J. (2018). *Revised Method for Deriving Australian and New Zealand Water Quality Guideline Values for Toxicants.* Canberra: Australian Government Department of Agriculture and Water Resources.

Appendix F

Borehole Logs (101 and 102)

Test Pit Logs (103 to 105 and 109 to 119)

BOREHOLE LOG

CLIENT: Hive Battery Developments Pty Ltd
PROJECT: Proposed Battery Energy Storage System (BESS)
LOCATION: 103 Cabbage Tree Road, Williamtown, NSW

SURFACE LEVEL: 1.2 AHD
COORDINATE: E:390755.9, N:6368102.8
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 101
PROJECT No: 226269.01
DATE: 28/02/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS			
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[^]	DENSITY.[^]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	BACKFILL	WELL PIPE
	1	0.20	TOPSOIL / Silty SAND (SM): brown; fine to medium; with rootlets.		TOP	NA		M		D		0.10	PID	<1ppm		
			Sandy CLAY (CL): dark brown mottled orange; low plasticity; fine to medium sand.		ALV	NA		w>PL w=PL		D		0.30	PID	<1ppm		
		0.45	CLAY (CH): orange mottled grey; high plasticity.		ALV	NA		w>PL		D		0.50	PID	<1ppm		
		0.75	Sandy CLAY (CL-CI): grey mottled orange; low to medium plasticity; fine sand.		ALV	NA		w>PL		D		1.00	PID	<1ppm		
▼ Free groundwater observed at 1.2m 28/02/24	0	1													Bentonite Concrete	50mm Class 18 PVC Casing
															Sand	50mm Class 18 PVC Screen
		2	Borehole discontinued at 2.00m depth. Limit of investigation.							D		2.00	PID	<1ppm		
	-1															

NOTES: [#] Soil origin is "probable" unless otherwise stated. [^] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hand Tools
METHOD: Hand auger to 2.0m
REMARKS:

OPERATOR: Douglas Partners

LOGGED: Lambert
CASING: Nil

Generated with CORE-GS by Geroc - Soil Log

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

BOREHOLE LOG

CLIENT: Hive Battery Developments Pty Ltd
PROJECT: Proposed Battery Energy Storage System (BESS)
LOCATION: 103 Cabbage Tree Road, Williamtown, NSW

SURFACE LEVEL: 1.3 AHD
COORDINATE: E:390755.6, N:6368175.2
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 102
PROJECT No: 226269.01
DATE: 28/02/24
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	SAMPLE DEPTH (m)	TESTING TEST TYPE	TESTING RESULTS AND REMARKS	BACKFILL	WELL PIPE
		0	FILL / Silty SAND (SM): brown; fine to medium; with rootlets, inclusions of glass, tile, brick, plastic.		FILL	NA	M		D		0.10	PID	<1ppm	Concrete, Bentonite	50mm Class 18 PVC Casing
									D		0.30	PID	<1ppm		
									D		0.50	PID	<1ppm		
		0.80	Sandy CLAY (CL): orange mottled grey; low plasticity; fine sand.												
		1	1.00m: high plasticity						D		1.00	PID	<1ppm		
▼ 28/02/24 Free groundwater observed at 1.2m	-0				ALV	NA	w>PL								
									D		1.50	PID	<1ppm	Sand	50mm Class 18 PVC Screen
		1.80	Clayey SAND (SC): grey; fine to medium.												
		2							D		2.00	PID	<1ppm		
	-1				ALV	NA	W								
									D		2.50	PID	<1ppm		
			Borehole discontinued at 2.80m depth. Limit of investigation.												

NOTES: [#] Soil origin is "probable" unless otherwise stated. [*] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hand Tools
METHOD: Hand auger to 2.8m
REMARKS:

OPERATOR: Douglas Partners

LOGGED: Lambert
CASING: Nil

Generated with CORE-GS by Geroc - Soil Log

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

TEST PIT LOG

CLIENT: Hive Battery Developments Pty Ltd
PROJECT: Proposed Battery Energy Storage System (BESS)
LOCATION: 103 Cabbage Tree Road, Williamtown, NSW

SURFACE LEVEL: 1.1 AHD
COORDINATE: E:390758.2, N:6368153.9
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 103
PROJECT No: 226269.01
DATE: 13/03/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[^] / DENSITY.[^]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
13/03/24 No free groundwater observed	1 / 0.20	TOPSOIL / Silty SAND (SM), with clay: brown; fine to medium; with rootlets.		TOP possibly ALV	NA	M		D/ES		0.10	PID	<1ppm
	0.50	CLAY (CH): orange mottled grey; high plasticity.		ALV	St	w>PL		D/ES		0.40	PID	<1ppm
		Sandy CLAY (CL-CI): grey mottled orange; low to medium plasticity; fine sand.		ALV	F to St	w>PL		D/ES		0.90	PID	<1ppm
	1 / 0 / -1 / 2	Test Pit discontinued at 1.00m depth. Limit of investigation.										

NOTES: [#] Soil origin is "probable" unless otherwise stated. [^] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Case 2TS CX17B
METHOD: 300mm bucket with teeth
REMARKS:

OPERATOR: Stan Davies Excavation
LOGGED: Helbig

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

TEST PIT LOG

CLIENT: Hive Battery Developments Pty Ltd
PROJECT: Proposed Battery Energy Storage System (BESS)
LOCATION: 103 Cabbage Tree Road, Williamtown, NSW

SURFACE LEVEL: 1.5 AHD
COORDINATE: E:390756.6, N:6368175.3
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 104
PROJECT No: 226269.01
DATE: 13/03/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[^]	DENSITY.[^]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
13/03/24 No free groundwater observed	1	FILL / Silty SAND (SM): brown; with rootlets, inclusions of glass, tile, brick, plastics.		FILL	NA		M		D/ES		0.10	PID	<1ppm
									D/ES		0.50	PID	<1ppm
	0.80	Sandy CLAY (CL): orange mottled grey; low plasticity; fine sand.		ALV	(S) to (F)		w>PL		D/ES		0.90	PID	<1ppm
	1	Test Pit discontinued at 1.00m depth. Limit of investigation.											
	0												
	2												
	-1												

NOTES: [#] Soil origin is "probable" unless otherwise stated. [^] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Case 2TS CX17B
METHOD: 300mm bucket with teeth
REMARKS:

OPERATOR: Stan Davies Excavation
LOGGED: Helbig

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

TEST PIT LOG

CLIENT: Hive Battery Developments Pty Ltd
PROJECT: Proposed Battery Energy Storage System (BESS)
LOCATION: 103 Cabbage Tree Road, Williamtown, NSW

SURFACE LEVEL: 1.5 AHD
COORDINATE: E:390756.4, N:6368190.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 105
PROJECT No: 226269.01
DATE: 13/03/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
13/03/24 No free groundwater observed	1	FILL / Silty SAND (SM), trace gravel: brown; fine to medium; fine to coarse, sub-angular to sub-rounded gravel; trace rootlets, inclusions of brick, ceramic, metal.		FILL	NA	M		D/ES		0.10	PID	<1ppm
								D/ES		0.50	PID	<1ppm
	0.60	Sandy CLAY (CL): dark brown mottled orange; low plasticity; medium sand; with organics.		ALV	(F)	w>PL		D/ES		0.80	PID	<1ppm
	0.90 / 1	Sandy CLAY (CL): grey mottled orange; low plasticity; fine sand.		ALV	(S) to (F)	w>PL		D/ES		1.00	PID	<1ppm
	0	Test Pit discontinued at 1.10m depth. Limit of investigation.										
	-1											
	2											

NOTES: [#] Soil origin is "probable" unless otherwise stated. [*] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Case 2TS CX17B
METHOD: 300mm bucket with teeth
REMARKS:

OPERATOR: Stan Davies Excavation
LOGGED: Helbig

Refer to explanatory notes for symbol and abbreviation definitions

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TEST PIT LOG

CLIENT: Hive Battery Developments Pty Ltd
PROJECT: Proposed Battery Energy Storage System (BESS)
LOCATION: 103 Cabbage Tree Road, Williamtown, NSW

SURFACE LEVEL: 1.1 AHD
COORDINATE: E:390703.6, N:6368103.9
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 109
PROJECT No: 226269.01
DATE: 13/03/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE			TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[^] / DENSITY.[^]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
13/03/24 No free groundwater observed	1	FILL / Silty SAND (SM), trace gravel: brown; fine to medium; fine to medium, sub-angular to sub-rounded gravel; with rootlets, inclusions of metal, paper.		FILL	NA	M		D/ES		0.10	PID	<1ppm
	0.20	Sandy CLAY (CL): dark brown mottled orange; low plasticity; fine to medium sand.		ALV	(St)	w<PL		D/ES		0.30	PID	<1ppm
	0.40	Sandy CLAY (CL): pale brown mottled orange; low plasticity; fine sand.		ALV	(St)	w<PL w=PL		D/ES		0.50	PID	<1ppm
	0.60	Sandy CLAY (CL-CI): grey mottled orange; low to medium plasticity; fine sand.		ALV	(F) to (St)	w>PL		D/ES		1.00	PID	<1ppm
	0											
	1	Test Pit discontinued at 1.10m depth. Limit of investigation.										
	-1											
	2											

NOTES: [#] Soil origin is "probable" unless otherwise stated. [^] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Case 2TS CX17B
METHOD: 300mm bucket with teeth
REMARKS:

OPERATOR: Stan Davies Excavation
LOGGED: Helbig

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

TEST PIT LOG

CLIENT: Hive Battery Developments Pty Ltd
PROJECT: Proposed Battery Energy Storage System (BESS)
LOCATION: 103 Cabbage Tree Road, Williamtown, NSW

SURFACE LEVEL: 1.2 AHD
COORDINATE: E:390727.3, N:6368091.9
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 110
PROJECT No: 226269.01
DATE: 13/03/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[^] / DENSITY.[^]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
13/03/24 No free groundwater observed	1 / 0.25	FILL / Silty SAND (SM), trace gravel: brown; fine to medium; fine to medium, sub-angular to sub-rounded gravel; with rootlets.		FILL	NA	M		D/ES		0.10	PID	<1ppm
	0.25	Sandy CLAY (CL): dark brown mottled orange; low plasticity; fine to medium sand; with rootlets.		ALV	(St)	w<PL		D/ES		0.30	PID	<1ppm
	0.45	Sandy CLAY (CL): pale brown mottled orange; low plasticity; fine sand.		ALV	(F) to (St)	w<PL w=PL		D/ES		0.60	PID	<1ppm
	0.70	Sandy CLAY (CL-CI): grey mottled orange; low to medium plasticity; fine sand.		ALV	(St)	w>PL		D/ES		0.90	PID	<1ppm
	1 / 0 / -1 / 2	Test Pit discontinued at 1.00m depth. Limit of investigation.										

NOTES: [#] Soil origin is "probable" unless otherwise stated. [^] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Case 2TS CX17B
METHOD: 300mm bucket with teeth
REMARKS:

OPERATOR: Stan Davies Excavation
LOGGED: Helbig

Refer to explanatory notes for symbol and abbreviation definitions

TEST PIT LOG

CLIENT: Hive Battery Developments Pty Ltd
PROJECT: Proposed Battery Energy Storage System (BESS)
LOCATION: 103 Cabbage Tree Road, Williamtown, NSW

SURFACE LEVEL: 1.8 AHD
COORDINATE: E:390736.6, N:6368112.5
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 111
PROJECT No: 226269.01
DATE: 13/03/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
13/03/24 No free groundwater observed	0.40	FILL / Silty SAND (SM): brown; fine to medium; with pockets of dark brown clay, with organics, (surface stockpile).		FILL	NA	M		D/ES		0.10	PID	<1ppm
	0.60	FILL / Silty SAND (SM): brown; fine to medium.		FILL	NA	M		D/ES		0.50	PID	<1ppm
	0.65	Sandy CLAY (CL): dark brown mottled orange; low plasticity; fine to medium sand.		ALV		w<PL		D/ES		0.70	PID	<1ppm
	0.90	CLAY (CH): orange mottled grey; high plasticity.		ALV	(St)	w>PL						
	1	Sandy CLAY (CL-CI): grey mottled orange; low to medium plasticity; fine sand.		ALV	(F)	w>PL		D/ES		0.95	PID	<1ppm
		Test Pit discontinued at 1.00m depth. Limit of investigation.										

NOTES: [#] Soil origin is "probable" unless otherwise stated. [*] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Case 2TS CX17B
METHOD: 300mm bucket with teeth
REMARKS: 400mm high stockpile at surface

OPERATOR: Stan Davies Excavation
LOGGED: Helbig

Refer to explanatory notes for symbol and abbreviation definitions

TEST PIT LOG

CLIENT: Hive Battery Developments Pty Ltd
PROJECT: Proposed Battery Energy Storage System (BESS)
LOCATION: 103 Cabbage Tree Road, Williamtown, NSW

SURFACE LEVEL: 1.2 AHD
COORDINATE: E:390755.4, N:6368102.4
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 112
PROJECT No: 226269.01
DATE: 13/03/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[^] / DENSITY.[^]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
13/03/24 No free groundwater observed	0.15	FILL / Silty SAND (SM): brown; fine to medium; with rootlets.		FILL	NA	M		D/ES		0.10	PID	<1ppm
	0.45	Sandy CLAY (CL): dark brown mottled orange; low plasticity; fine to medium sand.		ALV	(F) to (St)	w>PL w=PL		D/ES		0.30	PID	<1ppm
	0.75	CLAY (CH): orange mottled grey; high plasticity.		ALV	(St)	w>PL		D/ES		0.60	PID	<1ppm
	1	Sandy CLAY (CL-CI): grey mottled orange; low to medium plasticity; fine sand.		ALV	(F) to (St)	w>PL		D/ES		0.90	PID	<1ppm
		Test Pit discontinued at 1.00m depth. Limit of investigation.										

NOTES: [#] Soil origin is "probable" unless otherwise stated. [^] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Case 2TS CX17B
METHOD: 300mm bucket with teeth
REMARKS:

OPERATOR: Stan Davies Excavation
LOGGED: Helbig

Refer to explanatory notes for symbol and abbreviation definitions

TEST PIT LOG

CLIENT: Hive Battery Developments Pty Ltd
PROJECT: Proposed Battery Energy Storage System (BESS)
LOCATION: 103 Cabbage Tree Road, Williamtown, NSW

SURFACE LEVEL: 1.3 AHD
COORDINATE: E:390670.0, N:6368107.9
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 113
PROJECT No: 226269.01
DATE: 09/04/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	0.40	Silty SAND (SM): dark brown; fine to medium; with rootlets.		ALV	NA	M		D/ES		0.10	PID	2ppm
▼ 09/04/24		CLAY (CI), with sand: brown mottled orange; medium plasticity; fine sand.		ALV	F to St	w>PL		D/ES		0.50	PID	2ppm
Free groundwater observed at 0.65m		Test Pit discontinued at 0.70m depth. Limit of investigation.										

NOTES: [#] Soil origin is "probable" unless otherwise stated. [*] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 1.7T Excavator
METHOD: 300mm bucket with teeth
REMARKS:

OPERATOR: Stan Davies Excavation
LOGGED: Helbig

Refer to explanatory notes for symbol and abbreviation definitions

TEST PIT LOG

CLIENT: Hive Battery Developments Pty Ltd
PROJECT: Proposed Battery Energy Storage System (BESS)
LOCATION: 103 Cabbage Tree Road, Williamtown, NSW

SURFACE LEVEL: 1.6 AHD
COORDINATE: E:390699.2, N:6368127.1
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 114
PROJECT No: 226269.01
DATE: 09/04/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
09/04/24 No free groundwater observed	0.30	FILL / Sandy CLAY (CL), with gravel: brown; low plasticity; fine to medium sand; fine to coarse, sub-angular to sub-rounded gravel; with rootlets, inclusions of scrap metal, brick, rubber, geofabric, concrete.		FILL	NA	w<PL		D/ES		0.10	PID	1ppm
	0.70	Silty SAND (SM): dark brown; fine to medium.		ALV	NA	M		D/ES		0.50		
	1	CLAY (CI), with sand: brown mottled orange; medium plasticity; fine sand.		ALV	St	w>PL		D/ES		0.80	PID PP	<1ppm 100-120kPa
		Test Pit discontinued at 0.95m depth. Limit of investigation.										

NOTES: [#] Soil origin is "probable" unless otherwise stated. [*] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 1.7T Excavator
METHOD: 300mm bucket with teeth
REMARKS:

OPERATOR: Stan Davies Excavation
LOGGED: Helbig

Refer to explanatory notes for symbol and abbreviation definitions

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TEST PIT LOG

CLIENT: Hive Battery Developments Pty Ltd
PROJECT: Proposed Battery Energy Storage System (BESS)
LOCATION: 103 Cabbage Tree Road, Williamtown, NSW

SURFACE LEVEL: 1.6 AHD
COORDINATE: E:390721.6, N:6368140.7
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 115
PROJECT No: 226269.01
DATE: 09/04/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[^]	DENSITY.[^]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	0	FILL / Gravelly SAND (SP), with silt: brown; fine to medium; fine to coarse, sub-angular to sub-rounded gravel; inclusions of tile, ceramic, brick, PVC pipe, scrap metal, glass.		FILL					D/ES		0.10	PID	1ppm
									D/ES		0.50	PID	3ppm
	0.60	Sandy CLAY (CL-CI), trace gravel: grey dark grey; low to medium plasticity; fine to medium sand; fine to medium, sub-angular to sub-rounded gravel; with organics.		ALV					D/ES		0.70	PID	2ppm
	0.75	Sandy CLAY (CL-CI): grey green mottled brown; low to medium plasticity; fine sand.		ALV					D/ES		1.00	PID	2ppm
▼ Free groundwater observed at 1.0m 09/04/24	1	Test Pit discontinued at 1.10m depth. Limit of investigation.											
	-0												
	2												
	-1												

NOTES: [#] Soil origin is "probable" unless otherwise stated. [^] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 1.7T Excavator
METHOD: 300mm bucket with teeth
REMARKS:

OPERATOR: Stan Davies Excavation
LOGGED: Helbig

Refer to explanatory notes for symbol and abbreviation definitions

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TEST PIT LOG

CLIENT: Hive Battery Developments Pty Ltd
PROJECT: Proposed Battery Energy Storage System (BESS)
LOCATION: 103 Cabbage Tree Road, Williamtown, NSW

SURFACE LEVEL: 1.6 AHD
COORDINATE: E:390724.3, N:6368171.1
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 116
PROJECT No: 226269.01
DATE: 09/04/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[^] / DENSITY.[^]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	0	FILL / Silty SAND (SM), with gravel: dark brown; fine to medium; fine to coarse, angular to sub-angular gravel; inclusions of brick, concrete, tile, ceramic.		FILL	NA	M		D/ES		0.10	PID	1ppm
	0.45	SAND (SP): brown; fine to medium.		ALV				D/ES		0.50	PID	1ppm
	0.70	Sandy CLAY (CL-CI): brown mottled orange; low to medium plasticity; fine sand.		ALV	St	w>PL		D/ES		0.90	PID PP	<1ppm 100-130kPa
▼ 0.9m 09/04/24	1	Test Pit discontinued at 1.00m depth. Limit of investigation.										

Free groundwater observed at 0.9m 09/04/24

NOTES: [#] Soil origin is "probable" unless otherwise stated. [^] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 1.7T Excavator
METHOD: 300mm bucket with teeth
REMARKS:

OPERATOR: Stan Davies Excavation
LOGGED: Helbig

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

TEST PIT LOG

CLIENT: Hive Battery Developments Pty Ltd
PROJECT: Proposed Battery Energy Storage System (BESS)
LOCATION: 103 Cabbage Tree Road, Williamtown, NSW

SURFACE LEVEL: 1.6 AHD
COORDINATE: E:390717.1, N:6368200.9
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 117
PROJECT No: 226269.01
DATE: 09/04/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
09/04/24 No free groundwater observed		FILL / Sandy GRAVEL (GP): brown; fine to coarse, angular to sub-angular; fine to medium sand; inclusions of tile, brick, asphalt.		FILL	NA	M		D/ES		0.10	PID	2ppm
	0.20	FILL / Gravelly SAND (SP), with silt: brown dark brown; fine to medium; fine to coarse, sub-angular to sub-rounded gravel; inclusions of brick.		FILL	NA	M		D/ES		0.30	PID	<1ppm
	0.40	Silty CLAY (CI), trace sand: dark brown; medium plasticity; fine to medium sand.		ALV	F to St	w>PL		D/ES		0.45	PID	6ppm
		Test Pit discontinued at 0.50m depth. Limit of investigation.										

NOTES: [#] Soil origin is "probable" unless otherwise stated. [*] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Spade
METHOD: Spade
REMARKS:

OPERATOR: Stan Davies Excavation

LOGGED: Helbig

Refer to explanatory notes for symbol and abbreviation definitions

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TEST PIT LOG

CLIENT: Hive Battery Developments Pty Ltd
PROJECT: Proposed Battery Energy Storage System (BESS)
LOCATION: 103 Cabbage Tree Road, Williamtown, NSW

SURFACE LEVEL: 1.6 AHD
COORDINATE: E:390725.5, N:6368232.2
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 118
PROJECT No: 226269.01
DATE: 09/04/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[^] / DENSITY.[^]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
09/04/24 No free groundwater observed		FILL / Sandy GRAVEL (GP): brown; fine to coarse, sub-angular to sub-rounded; fine to medium sand; inclusions of concrete, asphalt.		FILL	NA	M		D/ES		0.10	PID	9ppm
	0.25											
	0.30	Sandy CLAY (CL): orange grey; low plasticity; fine to medium sand; pale green staining throughout.			F to St	w>PL		D/ES		0.27	PID	19ppm
		Silty CLAY (CI): dark brown; medium plasticity.		ALV	F	w>PL		D/ES		0.45	PID	9ppm
		Test Pit discontinued at 0.50m depth. Limit of investigation.										

NOTES: [#] Soil origin is "probable" unless otherwise stated. [^] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Spade
METHOD: Spade
REMARKS:

OPERATOR: Stan Davies Excavation

LOGGED: Helbig

Refer to explanatory notes for symbol and abbreviation definitions

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TEST PIT LOG

CLIENT: Hive Battery Developments Pty Ltd
PROJECT: Proposed Battery Energy Storage System (BESS)
LOCATION: 103 Cabbage Tree Road, Williamtown, NSW

SURFACE LEVEL: 1.6 AHD
COORDINATE: E:390723.9, N:6368269.9
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 119
PROJECT No: 226269.01
DATE: 09/04/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
09/04/24 No free groundwater observed		FILL / Gravelly SAND (SP), with silt: dark brown; fine to medium; fine to coarse gravel; inclusions of brick, glass, asphalt.		FILL	NA	M		D/ES		0.10	PID	47ppm
	0.35	Silty CLAY, with sand: dark brown.		ALV	NA	M		D/ES		0.45	PID	38ppm
		Test Pit discontinued at 0.50m depth. Limit of investigation.										

NOTES: [#] Soil origin is "probable" unless otherwise stated. [*] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Spade
METHOD: Spade
REMARKS:

OPERATOR: Stan Davies Excavation
LOGGED: Helbig

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

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Appendix G

Table G1: Summary Of Laboratory Results – Land Use

Table G2: Summary Of Laboratory Results – Waste Classification

Table G3: Summary Of Laboratory Results – Groundwater

Chain Of Custody – Field and Despatch

Sample Receipts

Laboratory Report Sheets (Envirolab Report 346423, 346566, 346566-A, 348566, 348566-A)

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Table G1: Summary of Laboratory Results – Land use

Metals

Sample ID	Depth	Sample Date	Total Arsenic	Beryllium	Boron	Cadmium	Total Chromium	Copper	Lead	Manganese	Mercury (inorganic)	Nickel	Selenium (Total)	Zinc	Iron	Molybdenum
		PQL	4	1	10	0.4	1	1	1	1	0.1	1	2	1	10	1
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
		HIL/HSL value / EIL/ESL/EGV value	3,000 / 160	500 / -	300,00 / -	900 / -	3,600 / 330	240,00 / 110	1,500 / 1,800	60,000 / -	730 / -	6,000 / 250	10,00 / -	400,000 / 300	- / -	- / -
103	0 - 0.1 m	13/03/2024	**5**	<1	<10	<0.4	**25**	**18**	**13**	**93**	<0.1	**19**	<2	**130**	**25,000**	<1
103	0.4 m	13/03/2024	**16**	**1**	<10	<0.4	**37**	**12**	**6**	**160**	<0.1	**28**	**3**	**47**	**72,000**	<1
104	0 - 0.1 m	13/03/2024	**6**	<1	<20	<0.4	**13**	**12**	**34**	**150**	<0.1	**9**	<2	**100**	**14,000**	<1
104	0.5 m	13/03/2024	**7**	<1	<10	<0.4	**12**	**9**	**22**	**150**	<0.1	**7**	<2	**96**	**16,000**	<1
104	0.9 m	13/03/2024	**5**	<1	<10	<0.4	**22**	**4**	**3**	**99**	<0.1	**17**	<2	**33**	**33,000**	<1
105	0 - 0.1 m	13/03/2024	<4	<1	<10	<0.4	**10**	**11**	**27**	**77**	<0.1	**5**	<2	**68**	**9,000**	<1
D1/LAH	0 - 0.1 m	13/03/2024	<4	<1	<10	<0.4	**17**	**15**	**38**	**200**	<0.1	**9**	<2	**95**	**13,000**	<1
D1/LAH - [DUPLICATE]	0 - 0.1 m	13/03/2024	<4	<1	<10	<0.4	**22**	**31**	**61**	**310**	**0.1**	**16**	<2	**510**	**29000**	<1
D1/LAH - [TRIPLICATE]	0 - 0.1 m	13/03/2024	<4	<1	<10	<0.4	**14**	**18**	**53**	**160**	**0.1**	**7**	<2	**110**	**11,000**	<1
105	0.5 m	13/03/2024	<4	<1	<10	<0.4	**11**	**12**	**27**	**70**	<0.1	**7**	<2	**70**	**8,600**	<1
106	0 - 0.2 m	13/03/2024	**4**	<1	<10	<0.4	**16**	**28**	**69**	**780**	**0.1**	**7**	<2	**160**	**14,000**	<1
106	0.45 m	13/03/2024	<4	<1	<10	<0.4	**22**	**13**	**10**	**39**	<0.1	**12**	<2	**32**	**15,000**	<1
107	0 - 0.1 m	13/03/2024	<4	<1	<10	<0.4	**18**	**10**	**9**	**66**	<0.1	**9**	<2	**41**	**13,000**	<1
107	0.4 m	13/03/2024	<4	<1	<10	<0.4	**15**	**8**	**4**	**56**	<0.1	**7**	<2	**25**	**7,600**	<1
108	0 - 0.1 m	13/03/2024	<4	**2**	**10**	<0.4	**30**	**14**	**12**	**2,300**	<0.1	**12**	**2**	**51**	**11,000**	<1
D2/LAH	-	13/03/2024	<4	**1**	<10	<0.4	**26**	**12**	**10**	**1000**	<0.1	**10**	<2	**44**	**9,400**	<1
108	0.5 m	13/03/2024	**7**	<1	<10	<0.4	**39**	**9**	**8**	**43**	<0.1	**18**	**3**	**32**	**31,000**	**2**
109	0 - 0.1 m	13/03/2024	**8**	<1	<10	<0.4	**27**	**13**	**9**	**180**	<0.1	**20**	**3**	**74**	**39,000**	<1
110	0 - 0.1 m	13/03/2024	**8**	<1	<10	<0.4	**27**	**10**	**7**	**200**	<0.1	**19**	**3**	**53**	**53,000**	<1
110	0.3 m	13/03/2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-
111	0 - 0.1 m	13/03/2024	**7**	<1	<10	<0.4	**26**	**16**	**9**	**170**	<0.1	**20**	**3**	**68**	**52,000**	<1
111	0.5 m	13/03/2024	**7**	<1	<10	<0.4	**29**	**19**	**10**	**190**	<0.1	**22**	**3**	**72**	**29,000**	<1
111	0.7 m	13/03/2024	**20**	**1**	<10	<0.4	**35**	**9**	**6**	**200**	<0.1	**27**	**8**	**45**	**150,000**	**1**
112	0 - 0.1 m	13/03/2024	**7**	<1	<10	<0.4	**26**	**12**	**9**	**140**	<0.1	**19**	**3**	**51**	**69,000**	<1
113	0.5 m	09/04/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-
114	0 - 0.1 m	09/04/24	**26**	<1	<10	<0.4	**51**	**35**	**31**	**310**	<0.1	**16**	<2	**63**	**21,000**	<1
115	0 - 0.1 m	09/04/24	**7**	<1	<10	<0.4	**18**	**40**	**43**	**360**	<0.1	**15**	<2	**97**	**19,000**	<1
116	0 - 0.1 m	09/04/24	**5**	<1	<10	**0.6**	**16**	**45**	**76**	**300**	<0.1	**10**	<2	**270**	**15,000**	<1
116	0.9 m	09/04/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-
117	0 - 0.1 m	09/04/24	<4	<1	<10	<0.4	**9**	**13**	**16**	**430**	<0.1	**6**	<2	**64**	**11,000**	<1
117	0.3 m	09/04/24	**5**	<1	<10	<0.4	**10**	**12**	**16**	**330**	<0.1	**7**	<2	**60**	**12,000**	<1
118	0 - 0.1 m	09/04/24	**8**	**1**	<20	<0.4	**41**	**19**	**28**	**1,500**	<0.1	**9**	<2	**80**	**19,000**	<1
D3/MJD	0 - 0.1 m	09/04/24	<4	<1	<10	<0.4	**10**	**16**	**21**	**490**	<0.1	**6**	<2	**61**	**12,000**	<1
118	0.3 m	09/04/24	**14**	<1	<10	<0.4	**17**	**7**	**7**	**36**	<0.1	**7**	<2	**36**	**18,000**	<1
118	0.5 m	09/04/24	**6**	<1	<10	<0.4	**17**	**12**	**11**	**71**	<0.1	**12**	<2	**32**	**17,000**	<1
119	0 - 0.1 m	09/04/24	**11**	<1	<10	<0.4	**18**	**68**	**270**	**840**	<0.1	**13**	<2	**280**	**22,000**	**1**
119	0.5 m	09/04/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-

PAH

Sample ID	Depth	Sample Date	Naphthalene b	Benzo(a)pyrene (B(a)P)	Benzo(a)pyrene TEQ (B(a)P TEQ)	Total PAH	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(g,h,i)perylene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	Pyrene
		PQL	1	0.05	0.5	0.05	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
		HIL/HSL value / EIL/ESL/EGV value	NL / 370	- / 1.4	40 / -	4,000 / -	- / -	- / -	- / -	- / -	- / -	- / -	- / -	- / -	- / -	- / -	- / -	- / -
103	0 - 0.1 m	13/03/2024	<1	**0.09**	<0.5	**0.4**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**0.2**	<0.1	<0.1	<0.1	**0.2**
103	0.4 m	13/03/2024	<1	<0.05	<0.5	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
104	0 - 0.1 m	13/03/2024	<1	**0.09**	<0.5	**0.4**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**0.2**	<0.1	<0.1	<0.1	**0.1**
104	0.5 m	13/03/2024	<1	**0.09**	<0.5	**0.5**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**0.2**	<0.1	<0.1	<0.1	**0.2**
104	0.9 m	13/03/2024	<1	<0.05	<0.5	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
105	0 - 0.1 m	13/03/2024	<1	**0.3**	<0.5	**2.4**	<0.1	<0.1	<0.1	**0.2**	**0.2**	**0.2**	<0.1	**0.5**	<0.1	**0.1**	**0.2**	**0.5**
D1/LAH	0 - 0.1 m	13/03/2024	<1	**0.3**	<0.5	**3.4**	<0.1	<0.1	<0.1	**0.2**	**0.2**	**0.2**	<0.1	**0.7**	<0.1	**0.2**	**0.4**	**0.7**
D1/LAH - [DUPLICATE]	0 - 0.1 m	13/03/2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D1/LAH - [TRIPLICATE]	0 - 0.1 m	13/03/2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
105	0.5 m	13/03/2024	<1	**4.2**	**6.2**	**69**	**0.4**	**0.9**	**2.5**	**3.9**	**3.3**	**4**	**0.6**	**14**	**0.8**	**2.7**	**12**	**12**
106	0 - 0.2 m	13/03/2024	<1	**1.4**	**1.9**	**16**	<0.1	**0.4**	**0.7**	**1.2**	**0.8**	**1.1**	**0.2**	**2.7**	**0.2**	**0.6**	**2.4**	**2.6**
106	0.45 m	13/03/2024	<1	**0.05**	<0.5	**0.2**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**0.1**	<0.1	<0.1	<0.1	<0.1
107	0 - 0.1 m	13/03/2024	<1	<0.05	<0.5	**0.1**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**0.1**	<0.1	<0.1	<0.1	<0.1
107	0.4 m	13/03/2024	<1	<0.05	<0.5	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
108	0 - 0.1 m	13/03/2024	<1	**0.3**	<0.5	**2.8**	<0.1	<0.1	<0.1	**0.2**	**0.2**	**0.2**	<0.1	**0.6**	<0.1	**0.2**	**0.2**	**0.5**
D2/LAH	-	13/03/2024	<1	**0.2**	<0.5	**1.9**	<0.1	<0.1	<0.1	**0.1**	**0.2**	**0.1**	<0.1	**0.4**	<0.1	**0.1**	**0.1**	**0.4**
108	0.5 m	13/03/2024	<1	<0.05	<0.5	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
109	0 - 0.1 m	13/03/2024	<1	**0.05**	<0.5	**0.2**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**0.1**	<0.1	<0.1	<0.1	<0.1
110	0 - 0.1 m	13/03/2024	<1	<0.05	<0.5	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
110	0.3 m	13/03/2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
111	0 - 0.1 m	13/03/2024	<1	<0.05	<0.5	**0.1**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**0.1**	<0.1	<0.1	<0.1	<0.1
111	0.5 m	13/03/2024	<1	**0.05**	<0.5	**0.2**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**0.1**	<0.1	<0.1	<0.1	<0.1
111	0.7 m	13/03/2024	<1	<0.05	<0.5	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
112	0 - 0.1 m	13/03/2024	<1	<0.05	<0.5	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
113	0.5 m	09/04/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
114	0 - 0.1 m	09/04/24	<1	**0.09**	<0.5	**0.3**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**0.1**	<0.1	<0.1	<0.1	**0.1**
115	0 - 0.1 m	09/04/24	<1	**0.1**	<0.5	**1**	<0.1	<0.1	<0.1	**0.1**	**0.1**	**0.1**	<0.1	**0.2**	<0.1	<0.1	<0.1	**0.2**
116	0 - 0.1 m	09/04/24	<1	**0.3**	<0.5	**3.2**	<0.1	<0.1	<0.1	**0.3**	**0.2**	**0.3**	<0.1	**0.5**	<0.1	**0.2**	**0.3**	**0.5**
116	0.9 m	09/04/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
117	0 - 0.1 m	09/04/24	<1	**2.5**	**3.6**	**27**	<0.1	**0.5**	**0.6**	**2**	**2.2**	**1.7**	**0.3**	**4.9**	<0.1	**1.6**	**2.1**	**4.6**
117	0.3 m	09/04/24	<1	**0.56**	**0.7**	**6.1**	<0.1	**0.1**	**0.1**	**0.4**	**0.5**	**0.4**	<0.1	**1.1**	<0.1	**0.4**	**0.5**	**1.1**
118	0 - 0.1 m	09/04/24	<1	**2.3**	**3.4**	**25**	<0.1	**0.5**	**0.6**	**1.8**	**2.3**	**1.5**	**0.3**	**4.4**	<0.1	**1.5**	**1.8**	**4.2**
D3/MJD	0 - 0.1 m	09/04/24	<1	**1.8**	**2.6**	**20**	<0.1	**0.4**	**0.4**	**1.4**	**1.8**	**1.2**	**0.2**	**3.5**	<0.1	**1.2**	**1.6**	**3.4**
118	0.3 m	09/04/24	<1	<0.05	<0.5	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
118	0.5 m	09/04/24	<1	**0.5**	**0.6**	**5.6**	<0.1	**0.1**	**0.1**	**0.4**	**0.4**	**0.4**	<0.1	**1.1**	<0.1	**0.3**	**0.6**	**1**
119	0 - 0.1 m	09/04/24	<1	**0.2**	<0.5	**4.3**	<0.1	<0.1	<0.1	**0.4**	**0.1**	**0.4**	<0.1	**0.8**	<0.1	**0.1**	**0.8**	**0.7**
119	0.5 m	09/04/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TRH, BTEX, Phenols, PCB, Asbestos

Sample ID	Depth	Sample Date	TRH C6 - C10	TRH >C10-C16	F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	TRH C6 - C9	TRH C10-C36	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total Phenolics	Total PCB	ACM >7mm Estimation	FA and AF Estimation	FA and AF Estimation	Asbestos ID in soil >0.1g/kg	Asbestos ID in soil <0.1g/kg	Trace Analysis (NEPC)	Total Asbestos#1
		PQL	25	50	25	50	100	100	25	50	0.2	0.5	1	1	5	0.1			0.001				0.1
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	g	g	%(w/w)	-	-	-	g/kg
		HIL/HSL value / EIL/ESL/EGV value	- / -	- / 170	260 / 215	NL / -	- / 1,700	- / 3,300	- / -	- / -	3 / 75	NL / 135	NL / 165	230 / 180	660 / -	7 / -	- / -	- / -	0.001 / -				
103	0 - 0.1 m	13/03/2024	<25	<50	<25	<50	**240**	<100	<25	**290**	<0.2	<0.5	<1	<1	<5	<0.1	-	-	-	-	-	-	-
103	0.4 m	13/03/2024	<25	<50	<25	<50	<100	<100	<25	<50	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-
104	0 - 0.1 m	13/03/2024	<25	<50	<25	<50	<100	<100	<25	<50	<0.2	<0.5	<1	<1	<5	<0.1	-	-	<0.001	NAD	NAD	NAD	<0.1
104	0.5 m	13/03/2024	<25	<50	<25	<50	**100**	<100	<25	<50	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-
104	0.9 m	13/03/2024	<25	<50	<25	<50	<100	<100	<25	<50	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-
105	0 - 0.1 m	13/03/2024	<25	<50	<25	<50	**230**	<100	<25	**270**	<0.2	<0.5	<1	<1	<5	<0.1	-	-	<0.001	NAD	NAD	NAD	<0.1
D1/LAH	0 - 0.1 m	13/03/2024	<25	<50	<25	<50	**170**	<100	<25	**110**	<0.2	<0.5	<1	<1	<5	<0.1	-	-	-	-	-	-	-
D1/LAH - [DUPLICATE]	0 - 0.1 m	13/03/2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D1/LAH - [TRIPLICATE]	0 - 0.1 m	13/03/2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
105	0.5 m	13/03/2024	<25	<50	<25	<50	**330**	**100**	<25	**380**	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-
106	0 - 0.2 m	13/03/2024	<25	<50	<25	<50	**740**	**250**	<25	**850**	<0.2	<0.5	<1	<1	<5	<0.1	-	-	<0.001	NAD	NAD	NAD	<0.1
106	0.45 m	13/03/2024	<25	<50	<25	<50	<100	<100	<25	<50	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-
107	0 - 0.1 m	13/03/2024	<25	<50	<25	<50	**100**	<100	<25	<50	<0.2	<0.5	<1	<1	<5	<0.1	-	-	<0.001	NAD	NAD	NAD	<0.1
107	0.4 m	13/03/2024	<25	<50	<25	<50	<100	<100	<25	<50	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-
108	0 - 0.1 m	13/03/2024	<25	<50	<25	<50	**220**	<100	<25	**260**	<0.2	<0.5	<1	<1	<5	<0.1	-	-	<0.001	NAD	NAD	NAD	<0.1
D2/LAH	-	13/03/2024	<25	<50	<25	<50	**170**	<100	<25	**120**	<0.2	<0.5	<1	<1	<5	<0.1	-	-	-	-	-	-	-
108	0.5 m	13/03/2024	<25	<50	<25	<50	<100	<100	<25	<50	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-
109	0 - 0.1 m	13/03/2024	<25	<50	<25	<50	**140**	<100	<25	<50	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-
110	0 - 0.1 m	13/03/2024	<25	<50	<25	<50	**220**	<100	<25	**270**	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-
110	0.3 m	13/03/2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
111	0 - 0.1 m	13/03/2024	<25	<50	<25	<50	**240**	**150**	<25	**340**	<0.2	<0.5	<1	<1	<5	<0.1	-	-	<0.001	NAD	NAD	NAD	<0.1
111	0.5 m	13/03/2024	<25	<50	<25	<50	**220**	<100	<25	**270**	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-
111	0.7 m	13/03/2024	<25	<50	<25	<50	<100	<100	<25	<50	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-
112	0 - 0.1 m	13/03/2024	<25	<50	<25	<50	<100	<100	<25	<50	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-
113	0.5 m	09/04/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
114	0 - 0.1 m	09/04/24	<25	<50	<25	<50	<100	<100	<25	<50	<0.2	<0.5	<1	<1	-	-	-	-	<0.001	NAD	NAD	NAD	<0.1
115	0 - 0.1 m	09/04/24	<25	<50	<25	<50	<100	<100	<25	<50	<0.2	<0.5	<1	<1	-	-	-	-	<0.001	NAD	NAD	NAD	<0.1
116	0 - 0.1 m	09/04/24	<25	<50	<25	<50	**280**	**130**	<25	**340**	<0.2	<0.5	<1	<1	<5	<0.1	-	-	<0.001	NAD	NAD	NAD	<0.1
116	0.9 m	09/04/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
117	0 - 0.1 m	09/04/24	<25	<50	<25	<50	**170**	**140**	<25	**130**	<0.2	<0.5	<1	<1	-	-	-	-	<0.001	NAD	NAD	NAD	<0.1
117	0.3 m	09/04/24	<25	<50	<25	<50	**140**	**120**	<25	**100**	<0.2	<0.5	<1	<1	-	-	-	-	<0.001	NAD	NAD	NAD	<0.1
118	0 - 0.1 m	09/04/24	<25	<50	<25	<50	**280**	**320**	<25	**380**	<0.2	<0.5	<1	<1	<5	<0.1	-	-	<0.001	NAD	NAD	NAD	<0.1
D3/MJD	0 - 0.1 m	09/04/24	<25	<50	<25	<50	**260**	**320**	<25	**360**	<0.2	<0.5	<1	<1	<5	<0.1	-	-	-	-	-	-	-
118	0.3 m	09/04/24	<25	<50	<25	<50	<100	<100	<25	<50	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-
118	0.5 m	09/04/24	<25	<50	<25	<50	**220**	**210**	<25	**300**	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-
119	0 - 0.1 m	09/04/24	<25	**79**	<25	**79**	**510**	**220**	<25	**680**	<0.2	<0.5	<1	<1	<5	<0.1	-	-	<0.001	NAD	NAD	NAD	<0.1
119	0.5 m	09/04/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

OCP

Sample ID	Depth	Sample Date	DDT+DDE+DDD c	Aldrin + Dieldrin	Total Chlordane	Total Endosulfan	Endrin	Heptachlor	Hexachlorobenzene	Methoxychlor	Mirex	Heptachlor Epoxide	Endrin Aldehyde	alpha-BHC	beta-BHC	delta-BHC	Lindane
		PQL	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
		HIL/HSL value / EIL/ESL/EGV value	3,600 / 640	45 / -	530 / -	2,000 / -	100 / -	50 / -	80 / -	2,500 / -	100 / -	- / -	- / -	- / -	- / -	- / -	- / -
103	0 - 0.1 m	13/03/2024	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
103	0.4 m	13/03/2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
104	0 - 0.1 m	13/03/2024	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
104	0.5 m	13/03/2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
104	0.9 m	13/03/2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
105	0 - 0.1 m	13/03/2024	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
D1/LAH	0 m	13/03/2024	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
105	0.5 m	13/03/2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
106	0 - 0.2 m	13/03/2024	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
106	0.45 m	13/03/2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
107	0 - 0.1 m	13/03/2024	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
107	0.4 m	13/03/2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
108	0 - 0.1 m	13/03/2024	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
D2/LAH	0 m	13/03/2024	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
108	0.5 m	13/03/2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
109	0 - 0.1 m	13/03/2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
110	0 - 0.1 m	13/03/2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
110	0.3 m	13/03/2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
111	0 - 0.1 m	13/03/2024	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
111	0.5 m	13/03/2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
111	0.7 m	13/03/2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
112	0 - 0.1 m	13/03/2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
113	0.5 m	09/04/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
114	0 - 0.1 m	09/04/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
115	0 - 0.1 m	09/04/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
116	0 - 0.1 m	09/04/24	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
116	0.9 m	09/04/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
117	0 - 0.1 m	09/04/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
117	0.3 m	09/04/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
118	0 - 0.1 m	09/04/24	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
D3/MJD	0 m	09/04/24	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
118	0.3 m	09/04/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
118	0.5 m	09/04/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
119	0 - 0.1 m	09/04/24	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
119	0.5 m	09/04/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

OPP, PFAS, pH and CEC

Sample ID	Depth	Sample Date	Chlorpyriphos	Azinphos methyl (Guthion)	Bromophos-ethyl	Chlorpyriphos-methyl	Diazinon	Dichlorvos	Dimethoate	Ethion	Ronnel (fenchlorphos)	Fenitrothion	Fenthion	Malathion	Parathion	Parathion-methyl	Methidathion	Fenamiphos	Total Positive PFAS	PFOA	PFOS + PFHxS	PFOS	PFHxS	6:2 FTS	8:2 FTS	pH 1:5 soil (CaCl)	Cation Exchange Capacity
		PQL	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.1	1
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pH units	cmol/kg
		HIL/HSL value / EIL/ESL/EGV value	2,000 / -	- / -	- / -	- / -	- / -	- / -	- / -	- / -	- / -	- / -	- / -	- / -	- / -	- / -	- / -	- / -	- / -	50 / 10	20 / -	20 / 1	20 / -	- / -	- / -	- / -	- / -
103	0 - 0.1 m	13/03/2024	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-
103	0.4 m	13/03/2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**7.3**	**30**
104	0 - 0.1 m	13/03/2024	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-
104	0.5 m	13/03/2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
104	0.9 m	13/03/2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
105	0 - 0.1 m	13/03/2024	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-
D1/LAH	0 m	13/03/2024	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-
105	0.5 m	13/03/2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
106	0 - 0.2 m	13/03/2024	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-
106	0.45 m	13/03/2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.001**	**0.0003**	**0.0007**	**0.0005**	**0.0002**	<0.0001	<0.0002	-	-
107	0 - 0.1 m	13/03/2024	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-
107	0.4 m	13/03/2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
108	0 - 0.1 m	13/03/2024	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**0.0016**	**0.0001**	**0.0015**	**0.0012**	**0.0002**	<0.0001	<0.0002	-	-
D2/LAH	0 m	13/03/2024	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-
108	0.5 m	13/03/2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**4.4**	**9.4**
109	0 - 0.1 m	13/03/2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
110	0 - 0.1 m	13/03/2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.0005**	<0.0001	**0.0005**	**0.0004**	**0.0001**	<0.0001	<0.0002	-	-
110	0.3 m	13/03/2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**5.2**	-
111	0 - 0.1 m	13/03/2024	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-
111	0.5 m	13/03/2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
111	0.7 m	13/03/2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
112	0 - 0.1 m	13/03/2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.0006**	<0.0001	**0.0006**	**0.0004**	**0.0001**	<0.0001	<0.0002	-	-
113	0.5 m	09/04/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	**7.0**	**22**
114	0 - 0.1 m	09/04/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
115	0 - 0.1 m	09/04/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
116	0 - 0.1 m	09/04/24	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-
116	0.9 m	09/04/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	-	-
117	0 - 0.1 m	09/04/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
117	0.3 m	09/04/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
118	0 - 0.1 m	09/04/24	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-
D3/MJD	0 m	09/04/24	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-
118	0.3 m	09/04/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
118	0.5 m	09/04/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
119	0 - 0.1 m	09/04/24	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-
119	0.5 m	09/04/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.0001**	<0.0001	**0.0001**	**0.0001**	<0.0001	<0.0001	<0.0002	-	-

Lab result	
HIL/HSL value	EIL/ESL/EGV value

HIL/HSL exceedance · EIL/ESL exceedance · HIL/HSL and EIL/ESL exceedance · ML exceedance · ML and HIL/HSL or EIL/ESL exceedance

Indicates that asbestos has been detected by the lab, refer to the lab report · **Blue** = DC exceedance · **Red** = EGV-indirect exceedance · HSL 0-<1 Exceedance

Bold = Lab detections   - = Not tested or No HIL/HSL/EIL/ESL (as applicable) or Not applicable   NL = Not limiting   NAD = No Asbestos detected

HIL = Health investigation level   HSL = Health screening level (excluding DC)   EIL = Ecological investigation level   ESL = Ecological screening level   EGV = Environmental Guideline Value   ML = Management Limit   DC = Direct Contact HSL

Notes:

- a QA/QC replicate of sample listed directly below the primary sample
- b Naphthalene reported as highest detection from the BTEXN or PAH suite, or if both results <PQL as lowest PQL
- c EIL criteria applies to DDT only

Site Assessment Criteria (SAC):

SAC based on generic land use thresholds for Commercial/ industrial D

Refer to the SAC section of report for information of SAC sources and rationale. Summary information as follows:

HIL	HIL-D (NEPC, 2013 or HEPA, 2020 (PFAS only))	EGV	EGV, all land uses, direct exposure (HEPA, 2020)
HSL (vapour intrusion)	HSL-D (NEPC, 2013)	ESL	Commercial and Industrial (NEPC, 2013)
DC	Direct contact HSL D Commercial/Industrial (CRC CARE, 2011)	ML	Commercial and Industrial (NEPC, 2013)
		EGV-Indir	EGV, all land uses, Indirect exposure (HEPA, 2020)

Douglas PARTNERS

Table G2: Summary of Laboratory Results – Waste Classification

			Metals															TRH		BTEX				Phenols	OCP					OPP	PCB	PFAS				Asbestos					
			Total Arsenic	Beryllium	Cadmium	Total Chromium	Lead	TCLP Lead	Mercury (inorganic)	Molybdenum	Nickel	Selenium (Total)	Boron	Copper	Iron	Manganese	Zinc	TRH C6 - C9	TRH C10-C36	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total Phenolics	Scheduled Chemical Waste (pesticide)	Total Endosulfan	Total Analysed OCP	Mirex	Total Analysed OPP	Total PCB	PFOA	TCLP PFOA	PFOS + PFHxS	TCLP PFOS + PFHxS	Asbestos ID in soil <0.1g/kg	Asbestos ID in soil <0.1g/kg	Trace Analysis (NEPC)	ACM >7mm Estimation	FA and AF Estimation	FA and AF Estimation	Total Asbestos#
		PQL	4	1	0.4	1	1	0.03	0.1	1	1	2	10	1	10	1	1	25	50	0.2	0.5	1	1	5	0.1	0.1	0.1	0.1	0.1	0.1	0.0001	0.00001	0.0001	0.00001						0.001	0.1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/L	mg/kg	mg/L	-	-	-	g	g	%(w/w)	g/kg
103	0 - 0.1 m	13/03/2024	**5**	<1	<0.4	**25**	**13**	-	<0.1	<1	**19**	<2	<10	**18**	**25,000**	**93**	**130**	<25	**290**	<0.2	<0.5	<1	<1	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-
103	0.4 m	13/03/2024	**16**	**1**	<0.4	**37**	**6**	-	<0.1	<1	**28**	**3**	<10	**12**	**72,000**	**160**	**47**	<25	<50	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
104	0 - 0.1 m	13/03/2024	**6**	<1	<0.4	**13**	**34**	-	<0.1	<1	**9**	<2	<20	**12**	**14,000**	**150**	**100**	<25	<50	<0.2	<0.5	<1	<1	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	NAD	NAD	NAD	-	-	<0.001	<0.1
104	0.5 m	13/03/2024	**7**	<1	<0.4	**12**	**22**	-	<0.1	<1	**7**	<2	<10	**9**	**16,000**	**150**	**96**	<25	<50	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
104	0.9 m	13/03/2024	**5**	<1	<0.4	**22**	**3**	-	<0.1	<1	**17**	<2	<10	**4**	**33,000**	**99**	**33**	<25	<50	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
105	0 - 0.1 m	13/03/2024	<4	<1	<0.4	**10**	**27**	-	<0.1	<1	**5**	<2	<10	**11**	**9,000**	**77**	**68**	<25	**270**	<0.2	<0.5	<1	<1	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	NAD	NAD	NAD	–	–	<0.001	<0.1
D1/LAH	0 m	13/03/2024	<4	<1	<0.4	**17**	**38**	-	<0.1	<1	**9**	<2	<10	**15**	**13,000**	**200**	**95**	<25	**110**	<0.2	<0.5	<1	<1	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-
105	0.5 m	13/03/2024	<4	<1	<0.4	**11**	**27**	-	<0.1	<1	**7**	<2	<10	**12**	**8,600**	**70**	**70**	<25	**380**	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
109	0 - 0.1 m	13/03/2024	**8**	<1	<0.4	**27**	**9**	-	<0.1	<1	**20**	**3**	<10	**13**	**39,000**	**180**	**74**	<25	<50	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
110	0 - 0.1 m	13/03/2024	**8**	<1	<0.4	**27**	**7**	-	<0.1	<1	**19**	**3**	<10	**10**	**53,000**	**200**	**53**	<25	**270**	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	<0.0001	<0.00001	**0.0005**	<0.00001	-	-	-	-	-	-	-
111	0 - 0.1 m	13/03/2024	**7**	<1	<0.4	**26**	**9**	-	<0.1	<1	**20**	**3**	<10	**16**	**52,000**	**170**	**68**	<25	**340**	<0.2	<0.5	<1	<1	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	NAD	NAD	NAD	–	–	<0.001	<0.1
111	0.5 m	13/03/2024	**7**	<1	<0.4	**29**	**10**	-	<0.1	<1	**22**	**3**	<10	**19**	**29,000**	**190**	**72**	<25	**270**	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
111	0.7 m	13/03/2024	**20**	**1**	<0.4	**35**	**6**	-	<0.1	**1**	**27**	**8**	<10	**9**	**150,000**	**200**	**45**	<25	<50	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
112	0 - 0.1 m	13/03/2024	**7**	<1	<0.4	**26**	**9**	-	<0.1	<1	**19**	**3**	<10	**12**	**69,000**	**140**	**51**	<25	<50	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	<0.0001	<0.00001	**0.0006**	<0.00001	-	-	-	-	-	-	-
D1/LAH - [TRIPLICATE]	0 m	13/03/2024	<4	<1	<0.4	**14**	**53**	-	**0.1**	<1	**7**	<2	<10	**18**	**11,000**	**160**	**110**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
113	0.5 m	09/04/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	-	<0.0001	-	-	-	-	-	-	-	-
114	0 - 0.1 m	09/04/24	**26**	<1	<0.4	**51**	**31**	-	<0.1	<1	**16**	<2	<10	**35**	**21,000**	**310**	**63**	<25	<50	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	–	–	<0.001	<0.1
115	0 - 0.1 m	09/04/24	**7**	<1	<0.4	**18**	**43**	-	<0.1	<1	**15**	<2	<10	**40**	**19,000**	**360**	**97**	<25	<50	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	–	–	<0.001	<0.1
116	0 - 0.1 m	09/04/24	**5**	<1	**0.6**	**16**	**76**	-	<0.1	<1	**10**	<2	<10	**45**	**15,000**	**300**	**270**	<25	**340**	<0.2	<0.5	<1	<1	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	NAD	NAD	NAD	–	–	<0.001	<0.1
116 - [TRIPLICATE]	0 - 0.1 m	09/04/24	**6**	<1	**0.5**	**19**	**79**	-	<0.1	<1	**11**	<2	<10	**47**	**21,000**	**400**	**250**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
116	0.9 m	09/04/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	-	<0.0001	-	-	-	-	-	-	-	-
117	0 - 0.1 m	09/04/24	<4	<1	<0.4	**9**	**16**	-	<0.1	<1	**6**	<2	<10	**13**	**11,000**	**430**	**64**	<25	**130**	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	–	–	<0.001	<0.1
117	0.3 m	09/04/24	**5**	<1	<0.4	**10**	**16**	-	<0.1	<1	**7**	<2	<10	**12**	**12,000**	**330**	**60**	<25	**100**	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	–	–	<0.001	<0.1
118	0 - 0.1 m	09/04/24	**8**	**1**	<0.4	**41**	**28**	-	<0.1	<1	**9**	<2	<20	**19**	**19,000**	**1,500**	**80**	<25	**380**	<0.2	<0.5	<1	<1	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	NAD	NAD	NAD	–	–	<0.001	<0.1
D3/M3D	0 m	09/04/24	<4	<1	<0.4	**10**	**21**	-	<0.1	<1	**6**	<2	<10	**16**	**12,000**	**490**	**61**	<25	**360**	<0.2	<0.5	<1	<1	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-
118	0.3 m	09/04/24	**14**	<1	<0.4	**17**	**7**	-	<0.1	<1	**7**	<2	<10	**7**	**18,000**	**36**	**36**	<25	<50	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
118	0.5 m	09/04/24	**6**	<1	<0.4	**17**	**11**	-	<0.1	<1	**12**	<2	<10	**12**	**17,000**	**71**	**32**	<25	**300**	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
119	0 - 0.1 m	09/04/24	**11**	<1	<0.4	**18**	**270**	<0.03	<0.1	**1**	**13**	<2	<10	**68**	**22,000**	**840**	**280**	<25	**680**	<0.2	<0.5	<1	<1	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	NAD	NAD	NAD	–	–	<0.001	<0.1
119 - [TRIPLICATE]	0 - 0.1 m	09/04/24	**8**	**1**	**0.4**	**20**	**140**	-	<0.1	**1**	**15**	<2	<10	**67**	**23,000**	**640**	**270**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
119	0.5 m	09/04/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	<0.00001	**0.0001**	<0.00001	-	-	-	-	-	-	-
Waste Classification Criteria [f]																																									
	CT1		100	20	20	100	100	-	4	100	40	20	-	-	-	-	-	650	10,000	10	288	600	1000	288	<50	60	-	-	4	<50	-	-	-	-	-	-	-	-	-	-	-
	SCC1		500	100	100	1,900	1,500	-	50	1000	1,050	50	-	-	-	-	-	650	10,000	18	518	1,080	1,800	518	<50	108	-	-	7.5	<50	18	-	1.8	-	-	-	-	-	-	-	-
	TCLP1						5						-	-	-	-	-														-	0.5	-	0.05	-	-	-	-	-	-	-
	CT2		400	80	80	400	400		16	400	160	80	-	-	-	-	-	2,600	40,000	40	1,152	2,400	4,000	1,152	<50	240	-	-	16	<50	-	-	-	-	-	-	-	-	-	-	-
	SCC2		2,000	400	400	7,600	6,000	-	200	4,000	4,200	200	-	-	-	-	-	2,600	40,000	72	2,073	4,320	7,200	2,073	<50	432	-	-	30	<50	72	-	7.2	-	-	-	-	-	-	-	-
	TCLP2							20																							2		0.2								

			PAH																														
			Benzo(a)pyrene (B(a)P)	TCLP Benzo(a)pyrene (B(a)P)	Total PAH	TCLP Total PAH	Acenaphthene	TCLP Acenaphthene	Acenaphthylene	TCLP Acenaphthylene	Anthracene	TCLP Anthracene	Benzo(a)anthracene	TCLP Benzo(a)anthracene	Benzo(b)+Fluoranthene	TCLP Benzo(b,j+k)Fluoranthene	Benzo(g,h,i)perylene	TCLP Benzo(g,h,i)perylene	Chrysene	TCLP Chrysene	Dibenzo(a,h)anthracene	TCLP Dibenzo(a,h)anthracene	Fluoranthene	TCLP Fluoranthene	Fluorene	TCLP Fluorene	Indeno(1,2,3-cd)pyrene	TCLP Indeno(1,2,3-cd)pyrene	Naphthalene	TCLP Naphthalene	Phenanthrene	TCLP Phenanthrene	Pyrene	TCLP Pyrene
	PQL		0.05	0.0001	0.05		0.1	0.0001	0.1	0.0001	0.1	0.0001	0.1	0.0001	0.2	0.0002	0.1	0.0001	0.1	0.0001	0.1	0.0001	0.1	0.0001	0.1	0.0001	0.1	0.0001	1	0.0001	0.1	0.0001	0.1	0.0001
Sample ID	Depth	Sample Date	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L
103	0 - 0.1 m	13/03/2024	**0.09**	-	**0.4**	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.2	-	<0.1	-	<0.1	-	<0.1	-	**0.2**	-	<0.1	-	<0.1	-	<1	-	<0.1	-	**0.2**	-
103	0.4 m	13/03/2024	<0.05	-	<0.05	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.2	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<1	-	<0.1	-	<0.1	-
104	0 - 0.1 m	13/03/2024	**0.09**	-	**0.4**	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.2	-	<0.1	-	<0.1	-	<0.1	-	**0.2**	-	<0.1	-	<0.1	-	<1	-	<0.1	-	**0.1**	-
104	0.5 m	13/03/2024	**0.09**	-	**0.5**	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.2	-	<0.1	-	<0.1	-	<0.1	-	**0.2**	-	<0.1	-	<0.1	-	<1	-	<0.1	-	**0.2**	-
104	0.9 m	13/03/2024	<0.05	-	<0.05	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.2	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<1	-	<0.1	-	<0.1	-
105	0 - 0.1 m	13/03/2024	**0.3**	-	**2.4**	-	<0.1	-	<0.1	-	<0.1	-	**0.2**	-	**0.4**	-	**0.2**	-	**0.2**	-	<0.1	-	**0.5**	-	<0.1	-	**0.1**	-	<1	-	**0.2**	-	**0.5**	-
D1/LAH	0 m	13/03/2024	**0.3**	-	**3.4**	-	<0.1	-	<0.1	-	<0.1	-	**0.2**	-	**0.5**	-	**0.2**	-	**0.2**	-	<0.1	-	**0.7**	-	<0.1	-	**0.2**	-	<1	-	**0.4**	-	**0.7**	-
105	0.5 m	13/03/2024	**4.2**	**0.0002**	**69**	**0.0004**	**0.4**	<0.0001	**0.9**	<0.0001	**2.5**	<0.0001	**3.9**	<0.0001	**6.9**	<0.0002	**3.3**	<0.0001	**4**	<0.0001	**0.6**	<0.0001	**14**	<0.0001	**0.8**	<0.0001	**2.7**	<0.0001	<1	**0.0002**	**12**	<0.0001	**12**	<0.0001
109	0 - 0.1 m	13/03/2024	**0.05**	-	**0.2**	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.2	-	<0.1	-	<0.1	-	<0.1	-	**0.1**	-	<0.1	-	<0.1	-	<1	-	<0.1	-	<0.1	-
110	0 - 0.1 m	13/03/2024	<0.05	-	<0.05	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.2	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<1	-	<0.1	-	<0.1	-
111	0 - 0.1 m	13/03/2024	<0.05	-	**0.1**	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.2	-	<0.1	-	<0.1	-	<0.1	-	**0.1**	-	<0.1	-	<0.1	-	<1	-	<0.1	-	<0.1	-
111	0.5 m	13/03/2024	**0.05**	-	**0.2**	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.2	-	<0.1	-	<0.1	-	<0.1	-	**0.1**	-	<0.1	-	<0.1	-	<1	-	<0.1	-	<0.1	-
111	0.7 m	13/03/2024	<0.05	-	<0.05	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.2	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<1	-	<0.1	-	<0.1	-
112	0 - 0.1 m	13/03/2024	<0.05	-	<0.05	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.2	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<1	-	<0.1	-	<0.1	-
D1/LAH - [TRIPLICATE]	0 m	13/03/2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
113	0.5 m	09/04/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
114	0 - 0.1 m	09/04/24	**0.09**	-	**0.3**	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.2	-	<0.1	-	<0.1	-	<0.1	-	**0.1**	-	<0.1	-	<0.1	-	<1	-	<0.1	-	**0.1**	-
115	0 - 0.1 m	09/04/24	**0.1**	-	**1**	-	<0.1	-	<0.1	-	<0.1	-	**0.1**	-	**0.2**	-	**0.1**	-	**0.1**	-	<0.1	-	**0.2**	-	<0.1	-	<0.1	-	<1	-	<0.1	-	**0.2**	-
116	0 - 0.1 m	09/04/24	**0.3**	-	**3.2**	-	<0.1	-	<0.1	-	<0.1	-	**0.3**	-	**0.6**	-	**0.2**	-	**0.3**	-	<0.1	-	**0.5**	-	<0.1	-	**0.2**	-	<1	-	**0.3**	-	**0.5**	-
116 - [TRIPLICATE]	0 - 0.1 m	09/04/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
116	0.9 m	09/04/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
117	0 - 0.1 m	09/04/24	**2.5**	<0.001	**27**	<0.001	<0.1	<0.001	**0.5**	<0.001	**0.6**	<0.001	**2**	<0.001	**3.7**	<0.0002	**2.2**	<0.001	**1.7**	<0.001	**0.3**	<0.001	**4.9**	<0.001	<0.1	<0.001	**1.6**	<0.001	<1	<0.001	**2.1**	<0.001	**4.6**	<0.001
117	0.3 m	09/04/24	**0.56**	-	**6.1**	-	<0.1	-	**0.1**	-	**0.1**	-	**0.4**	-	**0.8**	-	**0.5**	-	**0.4**	-	<0.1	-	**1.1**	-	<0.1	-	**0.4**	-	<1	-	**0.5**	-	**1.1**	-
118	0 - 0.1 m	09/04/24	**2.3**	<0.001	**25**	<0.001	<0.1	<0.001	**0.5**	<0.001	**0.6**	<0.001	**1.8**	<0.001	**3.6**	<0.0002	**2.3**	<0.001	**1.5**	<0.001	**0.3**	<0.001	**4.4**	<0.001	<0.1	<0.001	**1.5**	<0.001	<1	<0.001	**1.8**	<0.001	**4.2**	<0.001
D3/M3D	0 m	09/04/24	**1.8**	-	**20**	-	<0.1	-	**0.4**	-	**0.4**	-	**1.4**	-	**2.8**	-	**1.8**	-	**1.2**	-	**0.2**	-	**3.5**	-	<0.1	-	**1.2**	-	<1	-	**1.6**	-	**3.4**	-
118	0.3 m	09/04/24	<0.05	-	<0.05	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.2	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<1	-	<0.1	-	<0.1	-
118	0.5 m	09/04/24	**0.5**	-	**5.6**	-	<0.1	-	**0.1**	-	**0.3**	-	**0.4**	-	**0.7**	-	**0.4**	-	**0.4**	-	<0.1	-	**1.1**	-	<0.1	-	**0.3**	-	<1	-	**0.6**	-	**1**	-
119	0 - 0.1 m	09/04/24	**0.2**	-	**4.3**	-	<0.1	-	<0.1	-	<0.1	-	**0.4**	-	**0.6**	-	**0.1**	-	**0.4**	-	<0.1	-	**0.8**	-	<0.1	-	**0.1**	-	<1	-	**0.8**	-	**0.7**	-
119 - [TRIPLICATE]	0 - 0.1 m	09/04/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
119	0.5 m	09/04/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Waste Classification Criteria [f]																																		
	CT1		0.8	-	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	SCC1		10	-	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TCLP1		-	0.04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	CT2		3.2	-	800	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	SCC2		23	-	800	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TCLP2		-	0.16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CT1 exceedance TCLP1 and/or SCC1 exceedance CT2 exceedance TCLP2 and/or SCC2 exceedance Asbestos detection

- = Not tested, no criteria or not applicable NAD = no asbestos detected

Notes:

a QA/QC replicate of sample listed directly below the primary sample

b Total chromium used as initial screen for chromium(VI).

c Total recoverable hydrocarbons (TRH) used as an initial screen for total petroleum hydrocarbons (TPH)

d Criteria for scheduled chemicals used as an initial screen

e Criteria for Chlorpyrifos used as initial screen

f NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste

PQL Practical quantitation limit

CT1 Maximum values of specific contaminant concentration (SCC) for classification without TCLP: General solid waste

SCC1 Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste

TCLP1 Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste

CT2 Maximum values of specific contaminant concentration (SCC) for classification without TCLP: Restricted solid waste

SCC2 Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste

TCLP2 Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste

Table G3: Summary of Laboratory Results – Groundwater

		pH and EC		Metals - Dissolved																				
		Field pH	Field electrical conductivity	Aluminium	Antimony	Total Arsenic	Barium	Beryllium	Boron	Cadmium	Total Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury (inorganic)	Molybdenum	Nickel	Selenium (Total)	Silver	Tin (inorganic, SnIV)	Uranium	Zinc
	PQL	0.1	0.001	10	1	1	1	0.5	20	0.1	1	1	1	10	1	5	0.05	1	1	1	1	1	0.5	1
ANZECC (2000) DTV Lowland River		6.5 - 8.0	0.125 - 2.2																					
NEPM (2013) HSL D 2m to <4m																								
NHMRC (2018) ADWG Health					3	10	2,000	60	4,000	2			2,000		10	500	1	50	20	10	100		17	
NHMRC (2012) Recreation		6.5 - 8.5			30	100	20,000	600	40,000	20			20,000		100	5,000	10	500	200	100	1000		170	
ANZG (2018) 95% LOP Marine										5.5	4.4	1	1.3		4.4	80	0.1		70		1.4			8
HEPA (2018) 99% LOP Marine																								
ANZG (2018) 95% LOP Fresh				0.8	9	13			940	0.2	1	1.4	1.4		3.4	1,900	0.06	34	11	5	0.05		0.5	8
HEPA (2020) 99% LOP Fresh																								
Sample ID	Sample Date	pH units	mS/cm	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
101	13/03/24	**6.4**	**0.937**	<10	<1	**1**	**7**	<0.5	**50**	<0.1	<1	<1	**5**	**6,100**	<1	**150**	<0.05	<1	**18**	<1	<1	<1	<0.5	**330**
102	13/03/24	**6.1**	**0.712**	<10	<1	**9**	**20**	<0.5	**220**	<0.1	<1	**2**	**2**	**16,000**	<1	**270**	<0.05	**2**	**7**	<1	<1	<1	<0.5	**40**
D1/JCL	13/03/24	-	-	<10	<1	**9**	**19**	<0.5	**230**	<0.1	<1	**2**	<1	**16,000**	<1	**270**	<0.05	**2**	**6**	<1	<1	<1	<0.5	**39**

		TRH				BTEX					
		F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	Benzene	Toluene	Ethylbenzene	o-Xylene	m+p-Xylene	Total Xylenes
	PQL	10	50	100	100	1	1	1	1	2	1
ANZECC (2000) DTV Lowland River											
NEPM (2013) HSL D 2m to <4m		6000				5000					
NHMRC (2018) ADWG Health						1	800	300			600
NHMRC (2012) Recreation						10	8,000	3,000			6,000
ANZG (2018) 95% LOP Marine						700	180	500	350	75	
HEPA (2018) 99% LOP Marine											
ANZG (2018) 95% LOP Fresh						950	180	950	350	75	
HEPA (2020) 99% LOP Fresh											
Sample ID	Sample Date	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
101	13/03/24	<10	<50	<100	<100	<1	<1	<1	<1	<2	<1
102	13/03/24	<10	**93**	**200**	<100	<1	<1	<1	<1	<2	<1
D1/JCL	13/03/24	<10	<50	**190**	<100	<1	<1	<1	<1	<2	<1

		PAH															
		Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Naphthalene	Benzo(a)pyrene (B(a)P)	Benzo(b,j+k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	Pyrene	Sum of detected PAH
	PQL	0.1	0.1	0.1	0.1	1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
ANZECC (2000) DTV Lowland River																	
NEPM (2013) HSL D 2m to <4m																	
NHMRC (2018) ADWG Health							0.01										
NHMRC (2012) Recreation							0.1										
ANZG (2018) 95% LOP Marine				0.01		50	0.1					1			0.6		
HEPA (2018) 99% LOP Marine																	
ANZG (2018) 95% LOP Fresh				0.01		16	0.1					1			0.6		
HEPA (2020) 99% LOP Fresh																	
Sample ID	Sample Date	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
101	13/03/24	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
102	13/03/24	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
D1/JCL	13/03/24	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

		PFAS						
		PFOS	PFOA	PFHxS	6:2 FTS	8:2 FTS	PFOS + PFHxS	Sum of detected PFAS
	PQL	0.0002	0.0002	0.0002	0.0004	0.0004	0.0002	0.0002
ANZECC (2000) DTV Lowland River								
NEPM (2013) HSL D 2m to <4m								
NHMRC (2018) ADWG Health		0.07	0.56	0.07				
NHMRC (2012) Recreation			10				2	
ANZG (2018) 95% LOP Marine								
HEPA (2018) 99% LOP Marine		0.00023	19					
ANZG (2018) 95% LOP Fresh								
HEPA (2020) 99% LOP Fresh		0.00023	19					
Sample ID	Sample Date	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
101	13/03/24	**0.0007**	**0.002**	**0.02**	<0.0004	<0.0004	**0.0207**	**0.023**
102	13/03/24	**0.012**	**0.019**	**0.014**	<0.0004	<0.0004	**0.0260**	**0.045**
D1/JCL	13/03/24	**0.012**	**0.02**	**0.014**	<0.0004	<0.0004	**0.0260**	**0.046**

		VOC (excluding BTEX)																										
		1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2,2-tetrachloroethane	tetrachloroethene	1,1,2-trichloroethane	1,1,2-trichloroethylene	1,1-dichloroethane	1,1-Dichloroethene	1,1-dichloropropene	1,2,3-trichlorobenzene	1,2,3-trichloropropane	1,2,4-trichlorobenzene	1,2,4-trimethyl benzene	1,2-dibromo-3-chloropropane	1,2-dichlorobenzene	1,2-dichloroethane	1,2-dichloropropane	1,3,5-trimethyl benzene	1,3-dichlorobenzene	1,3-dichloropropane	1,4-dichlorobenzene	2,2-dichloropropane	2-chlorotoluene	4-chlorotoluene	4-isopropyl toluene	Bromobenzene	Bromochloromethane
	PQL	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ANZECC (2000) DTV Lowland River																												
NEPM (2013) HSL D 2m to <4m																												
NHMRC (2018) ADWG Health					50				30							1,500	3					40						
NHMRC (2012) Recreation					500				300							15,000	30					400						
ANZG (2018) 95% LOP Marine			270	400	70	1,900	330		700				20				1,900	900			1,100							
HEPA (2018) 99% LOP Marine																												
ANZG (2018) 95% LOP Fresh			270	400	70	6,500	330		700		3		85			160	1,900	900		260	1,100	60						
HEPA (2020) 99% LOP Fresh																												
Sample ID	Sample Date	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
101	13/03/24	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
102	13/03/24	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
D1/JCL	13/03/24	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1

		VOC (excluding BTEX)																										
		Bromodichloromethane	Bromoform	carbon tetrachloride	Chloroethane	Vinyl Chloride	Chloroform	Chloromethane	cis-1,2-dichloroethene	cis-1,3-dichloropropene	Isopropylbenzene (cumene)	Cyclohexane	dibromochloromethane	Dibromomethane	Dichlorodifluoromethane	1,2-dibromoethane	hexachlorobutadiene	Bromomethane	Monochlorobenzene	n-butyl benzene	n-propyl benzene	sec-butyl benzene	Styrene (vinylbenzene)	Tert-butyl benzene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Trichlorofluoromethane	Sum of detected VOC
	PQL	1	1	1	10	10	1	10	1	1	1	1	1	1	10	1	1	10	1	1	1	1	1	1	1	1	10	1
ANZECC (2000) DTV Lowland River																												
NEPM (2013) HSL D 2m to <4m																												
NHMRC (2018) ADWG Health				3		0.3										1	0.7	1	300				30					
NHMRC (2012) Recreation				30		3										10	7	10	3,000				300					
ANZG (2018) 95% LOP Marine				240		100	770				30								55									
HEPA (2018) 99% LOP Marine																												
ANZG (2018) 95% LOP Fresh				240		100	770				30								55									
HEPA (2020) 99% LOP Fresh																												
Sample ID	Sample Date	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
101	13/03/24	<1	<1	<1	<10	<10	<1	<10	<1	<1	<1	<1	<1	<1	<10	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1
102	13/03/24	<1	<1	<1	<10	<10	<1	<10	<1	<1	<1	<1	<1	<1	<10	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1
D1/JCL	13/03/24	<1	<1	<1	<10	<10	<1	<10	<1	<1	<1	<1	<1	<1	<10	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1

Notes:

- \- No criterion / not defined / not tested / not applicable
- * QA/QC replicate of sample listed directly below the primary sample
- NL Not limiting
- PQL Practical quantitation limit
- **Bold** results indicate detection above practical quantitation limit (PQL)

Shaded cell is exceedance of guideline value

Where one or more guideline value is exceeded, the cell is shaded to the colour of the highest guideline value exceeded

ANZECC (2000) Australian and New Zealand Guidelines for Fresh and Marine Water Quality

ANZG (2018) Australian and New Zealand Guidelines for Fresh and Marine Water Quality, 95% level of protection of species for Fresh aquatic ecosystems [NB: 99% level of protection adopted for bioaccumulative chemicals]

ANZG (2018) Australian and New Zealand Guidelines for Fresh and Marine Water Quality, 95% level of protection of species for Marine aquatic ecosystems [NB: 99% level of protection adopted for bioaccumulative chemicals]

HEPA (2018) PFAS National Environmental Management Plan, Version 2 99% level of protection for Fresh water aquatic ecosystems

HEPA (2018) PFAS National Environmental Management Plan, 99% level of protection for Marine water aquatic ecosystems

NHMRC (2018) Australian Drinking Water Guidelines 6 2011, drinking water aesthetic-based criteria

NHMRC (2008) Guidelines for Managing Risk in Recreational Water

NEPM (2013) HSL D (commercial and industrial land use) for vapour intrusion

ANZG (2018) Australian and New Zealand Guidelines for Fresh and Marine Water Quality, orange text is 'unknown' level of protection

Underlining of ANZG (2018) criteria indicates a criteria with an 'unknown' level of protection.

ANZG (2018) DGV adopted for most conservative species of following analytes: DGV for xylene (m) adopted for xylene (m+p); DGV for CrVI adopted for total chromium; DGV for AsV adopted for total arsenic

ANZG (2018) DGV adopted for aluminium in freshwater is for receiving waters with pH >6.5. For receiving waters with pH <6.5 suitability of the more conservative, low reliability DGV of unknown LOP should be considered

D1/JCL is a replicate sample of 102

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CHAIN OF CUSTODY FIELD SHEET

Project No:	226269.01	**Client Project Name:**	Proposed BESS
Client:	Hive Battery Developments	**Location:**	103 Cabbage Tree Road, Williamtown
Project Manager:	JCL	**DP Lab Received** By:	NA Date:

Do samples contain 'potential' HBM? Yes ☐ No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)

Field									DP Lab	For Despatch to			Notes
Sample ID	Depth (m)	Duplicate Sample	Sample Type S - soil W - water	Container Type G - glass P - plastic	ASS Samples	Sampling By	Sampling Date	Sampling Time	Storage Locn *	Lab 1 [A] Date	Lab 2 [B] Date	Lab 3 [C] Date	
101			W	G,P		JCL	13/3/24	1000		13/3/24			
102		D1/JCL	↓	↓		↓	↓	↓		↓			
TSW1			↓	G		↓	↓	↓		↓			
TBW1			↓	↓		↓	↓	↓		↓			
TS51			S	↓		↓	↓	↓		↓			
TB51			↓	↓		↓	↓	1400		↓			

*** Default storage:** **glass containers in fridge, plastic containers shelved, ASS in freezer, water samples in fridge**

A Provide name of Lab 1 B Provide name of Lab 2 C Provide name of Lab 3

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CHAIN OF CUSTODY FIELD SHEET

Project No:	**226269.01**	**Client Project Name:**	**Proposed BESS**
Client:	**Hive Battery Developments**	**Location:**	**103 Cabbage Tree Road, Williamtown**
Project Manager:	**JCL**	**DP Lab Received**	By: Date:

Do samples contain 'potential' HBM? Yes ☐ No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)

Field									DP Lab	For Despatch to			Notes
Sample ID	Depth (m)	Duplicate Sample	Sample Type S - soil W - water	Container Type G - glass P - plastic	ASS Samples	Sampling By	Sampling Date	Sampling Time	Storage Locn *	Lab 1 [A] Date	Lab 2 [B] Date	Lab 3 [C] Date	
101/	0-0.1		S	P		JCL	28/2/24	0800	BAM115				
	0.3		↓	↓		↓	↓	↓	↓				
	0.5												
	1.0												
	2.0												
102/	0-0.1												
	0.3												
	0.5												
	1.0												
	1.5												
	2.0												
	2.5		↓	↓		↓	↓	1200	↓				

*** Default storage: glass containers in fridge, plastic containers shelved, ASS in freezer, water samples in fridge**

A Provide name of Lab 1 B Provide name of Lab 2 C Provide name of Lab 3

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CHAIN OF CUSTODY FIELD SHEET

Project No:	226269.01	**Client Project Name:**	Proposed BESS
Client:	Hive Battery Developments	**Location:**	103 Cabbage Tree Road, Williamtown
Project Manager:	JCL	**DP Lab Received**	By: Date:

Do samples contain 'potential' HBM? Yes ☐ No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)

Field									DP Lab	For Despatch to			Notes
Sample ID	Depth (m)	Duplicate Sample	Sample Type S - soil W - water	Container Type G - glass P - plastic	ASS Samples	Sampling By	Sampling Date	Sampling Time	Storage Locn *	Lab 1 [A] Date	Lab 2 [B] Date	Lab 3 [C] Date	
103	0-0.1		S	G, P		LAH	13/3/24	1000	ITS	14/3/24			
	0.4												
	0.9												
104	0-0.1												
	0.5												
	0.9												
105	0-0.1	D1/LAH											
	0.5												
	0.8												
	1-0												
106	0-0.2												
	0.45												
	0.8												
107	0-0.1												
	0.4												
	0.8												
	1-1							1120					

* **Default storage: glass containers in fridge, plastic containers shelved, ASS in freezer, water samples in fridge**

A Provide name of Lab 1 Envirolab

B Provide name of Lab 2

C Provide name of Lab 3

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CHAIN OF CUSTODY FIELD SHEET

Project No:	226269.01	**Client Project Name:**	Proposed BESS
Client:	Hive Battery Developments	**Location:**	103 Cabbage Tree Road, Williamtown
Project Manager:	JCL	**DP Lab Received**	By: Date:

Do samples contain 'potential' HBM? Yes ☐ No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)

Field									DP Lab	For Despatch to			Notes
Sample ID	Depth (m)	Duplicate Sample	Sample Type S - soil W - water	Container Type G - glass P - plastic	ASS Samples	Sampling By	Sampling Date	Sampling Time	Storage Locn *	Lab 1 [A] Date	Lab 2 [B] Date	Lab 3 [C] Date	
108	0-0.1	D2/LAM	S	G, P		LAM	13/3/24	1000	115	✓ 14/3/24			
	0.5									✓			
	1.0												
109	0-0.1	B3/LAM								✓			
	0.3												
	0.5												
	1.0												
110	0-0.1									✓			
	0.3									✓			
	0.6												
	0.9												
111	0-0.1	D4/LAM								✓			
	0.5									✓			
	0.7									✓			
	0.95												
112	0-0.1									✓			
	0.3												
	0.6												
	0.9	D5/LAM						1500					

* **Default storage: glass containers in fridge, plastic containers shelved, ASS in freezer, water samples in fridge**

A Provide name of Lab 1 Envirolab

B Provide name of Lab 2

C Provide name of Lab 3

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CHAIN OF CUSTODY FIELD SHEET

Project No:	226269.01	**Client Project Name:**	Proposed BESS
Client:	Hive Battery Developments	**Location:**	103 Cabbage Tree Road, Williamtown
Project Manager:	JCL	**DP Lab Received**	By: JL Date: 9/4/24

Do samples contain 'potential' HBM? Yes x No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)

Field									DP Lab	For Despatch to			Notes
Sample ID	Depth (m)	Duplicate Sample	Sample Type S - soil W - water	Container Type G - glass P - plastic	ASS Samples	Sampling By	Sampling Date	Sampling Time	Storage Locn *	Lab 1 [A] Date	Lab 2 [B] Date	Lab 3 [C] Date	
113	0-0.1	D1/MD	S	GP		LAH/MSD	9/4/24	09:15	Jars	10/4/24			
↓	0.5		↓	↓		↓	↓	↓	in new	✓			
114	0-0.1								Fridge	✓			
↓	0.5												
	0.8								PIDs in	✓			
115	0-0.1								~~SAFS~~				
	0.5								Bay 112				
↓	0.7												
	1.0								500mLs	✓			
116	0-0.1								in old				
↓	0.5	D2/MD							Fridge	✓			
↓	0.9												
117	0-0.1									✓			
↓	0.3									✓			
	0.45												
119	0-0.1	D3/MSD								✓			
	0.27									✓			

*** Default storage:** glass containers in fridge, plastic containers shelved, ASS in freezer, water samples in fridge

A Provide name of Lab 1 Envirolab. B Provide name of Lab 2 C Provide name of Lab 3

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CHAIN OF CUSTODY FIELD SHEET

Project No:	226269.01	**Client Project Name:**	Proposed BESS
Client:	Hive Battery Developments	**Location:**	103 Cabbage Tree Road, Williamtown
Project Manager:	JCL	**DP Lab Received**	By: JCL Date: 9/4/2024

Do samples contain 'potential' HBM? Yes x No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)

Field									DP Lab	For Despatch to			Notes
Sample ID	Depth (m)	Duplicate Sample	Sample Type S - soil W - water	Container Type G - glass P - plastic	ASS Samples	Sampling By	Sampling Date	Sampling Time	Storage Locn *	Lab 1 [A] Date	Lab 2 [B] Date	Lab 3 [C] Date	
118	0.45		S	GP		LAH/MJD	9/4/24	15:30	See	Envirolab ✓			
↓	M1		↓	↓		↓	↓	↓	Page 1				Asphalt sample
119	0-0.1		↓	↓		↓	↓	↓	↓	✓			
	0.45		↓	↓		↓	↓	↓	↓	✓			

* **Default storage:** **glass containers in fridge, plastic containers shelved, ASS in freezer, water samples in fridge**

A Provide name of Lab 1 Envirolab B Provide name of Lab 2 C Provide name of Lab 3

Douglas PARTNERS — CHAIN OF CUSTODY DESPATCH SHEET

Project No:	226269.01	**Suburb:**	Williamtown	**To:**	Envirolab Services
Project Manager:	Jason Lambert	**Order Number:**	NC232548	**Sampler:**	12 Ashley St, Chatswood NSW 2067
Email:	jason.lambert@douglaspartners.com.au			**Attn:**	Sample Receipt
Turnaround time:	☑ Standard ☐ 72 hour ☐ 48 hour ☐ 24 hour ☐ Same day				(02) 9910 6200 samplereceipt@envirolab.com
Prior Storage:	☐ Fridge ☐ Freezer ☑ Esky ☐ Shelf	**Do samples contain 'potential' HBM?**	☑ No ☐ Yes (If YES, handle, transport, store in accordance with FPM HAZID)		

Lab ID	Sample ID: Location / Other ID	Depth From	Depth To	Date Sampled	Sample Type: S - soil W - water M - Material	Container Type: G - glass P - plastic	Analytes: TRH	BTEXN	PAH (low level)	Metals (21)	VOC	PFAS short suite - trace level	TRIPSPIKE Blanks				Notes/ Preservation/ Additional Requirements
1	101			13/3/24	W	G,P	✓	✓	✓	✓	✓	✓					Combo 3 + VOC + PFAS
2	102						✓	✓	✓	✓	✓	✓					
3	D1/JCC						✓	✓	✓	✓	✓	✓					
4	TSW1					G							✓				
5	TBW1												✓				
6	TSS1				S								✓				
7	TBS1												✓				

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 346423
Date Received: 14/3/24
Time Received: 1030
Received By: DC
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Metals to analyse:			
Number of samples in container:	7	**Transported to laboratory by:**	
Send results to:	Douglas Partners Pty Ltd		
Address:	15 Callistemon Close, Warabrook NSW 2	**Phone:**	(02) 4960 9600
Relinquished by:	JCa	**Date:**	13/3/24 **Signed:**

LAB RECEIPT

Lab Ref. No:	346423
Received by:	DC
Date & Time	14/3/24 1030
Signed:	

Douglas PARTNERS

CHAIN OF CUSTODY DESPATCH SHEET

Project No: 226269.01	**Suburb:** Williamtown		**To:** Envirolab Services
Project Manager: Jason Lambert			**Dispatch date:**

Lab ID	Sample ID: Location / Other ID	Sample ID: Depth From	Sample ID: Depth To	Date Sampled	Sample Type: S - soil, W - water, M - Material	Container Type: G - glass, P - plastic	Analytes: Combo 3	Combo 8	Combo 8_AN	pH(CaCl) + CEC		PFAS - short suite trace level						Notes/ Preservation/ Additional Requirements
15	110	0	0.1				✓					✓						
16	110	0.3								✓								
17	111	0	0.1				✓		✓									
18	111	0.5					✓											
19	111	0.7					✓											
20	112	0	0.1				✓					✓						
21	D1/LAH							✓										
22	D2/LAH							✓										
																		346566 15/3/24, 1045

Douglas PARTNERS

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	226269.01	**Suburb:**	Williamtown	**To:**	Envirolab Services
Project Manager:	Jason Lambert	**Order Number:**	NC232548	**Sampler:**	LAH
					12 Ashley St, Chatswood NSW 2067
Email:	jason.lambert@douglaspartners.com.au			**Attn:**	Sample Receipt
Turnaround time	☑ Standard ☐ 72 hour ☐ 48 hour ☐ 24 hour ☐ Same day				(02) 9910 6200 samplereceipt@envirolab.com
Prior Storage	☑ Fridge ☐ Freezer ☑ Esky ☐ Shelf	**Do samples contain 'potential' HBM?**	☐ No	☑ Yes	(If YES, handle, transport, store in accordance with FPM HAZID)

Lab ID	Sample ID: Location / Other ID	Depth From	Depth To	Date Sampled	Sample Type: S - soil W - water M - Material	Container Type: G - glass P - plastic	Analytes: Combo 3	Combo 8	Combo 8_AN	pH(CaCl) + CEC		PFAS - short suite trace level					Notes/ Preservation/ Additional Requirements
1	103	0	0.1					✓									
2	103	0.4					✓			✓							
3	104	0	0.1						✓								
4	104	0.5					✓										
5	104	0.9					✓										
6	105	0	0.1						✓								
7	105	0.5					✓										
8	106	0	0.2						✓								
9	106	0.45					✓					✓					
10	107	0	0.1						✓								
11	107	0.4					✓										
12	108	0	0.1						✓			✓					
13	108	0.5					✓			✓							
14	109	0	0.1				✓										

ENVIROLAB
Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 346566
Date Received: 15/3/24
Time Received: 1045
Received By: DR
Temp: Cool/Ambient
Cooling: Ice/Icepack 4° C.
Security: Intact/Broken/None

Metals to analyse:	As, Cd, Cr, Cu, Hg, Ni, Zn, Pb, Fe, Mn, Be, B, Mo, Se		
Number of samples in container:	22	**Transported to laboratory by:**	
Send results to:	Douglas Partners Pty Ltd		
Address:	15 Callistemon Close, Warabrook NSW 23	**Phone:**	(02) 4960 9600
Relinquished by:		**Date:**	**Signed:**

LAB RECEIPT

Lab Ref. No:	346566
Received by:	DR
Date & Tim:	15/3/24 1045
Signed:	

Douglas PARTNERS

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	226269.01	**Suburb:**	Williamtown	**To:**	Envirolab Services
Project Manager:	Jason Lambert	**Order Number:**	NC232548	**Sampler:**	LAH		12 Ashley St, Chatswood NSW 2067
Email:	jason.lambert@douglaspartners.com.au				**Attn:** Sample Receipt
Turnaround time	☑ Standard ☐ 72 hour ☐ 48 hour ☐ 24 hour ☐ Same day				(02) 9910 6200 samplereceipt@envirolab.com
Prior Storage	☑ Fridge ☐ Freezer ☑ Esky ☐ Shelf	**Do samples contain 'potential' HBM?**	☐ No	☑ (Yes)	IF YES, handle, transport, store in accordance with FPM HAZID)

Lab ID	Sample ID: Location / Other ID	Depth From	Depth To	Date Sampled	Sample Type: S - soil W - water M - Material	Container Type: G - glass P - plastic	Analytes: Combo 3	Combo 3_AN	Combo 8	Combo 8_AN	pH(CaCl) + CEC	PFAS - short suite trace level	Trip Spike Trip Blank				Notes/ Preservation/ Additional Requirements
1	113	0.5	-	9/04/24	S	G,P					✓	✓					
2	114	0.0	0.1	9/04/24	S	G,P		✓									
3	115	0.0	0.1	9/04/24	S	G,P		✓									
4	116	0.0	0.1	9/04/24	S	G,P				✓							
5	116	0.9	-	9/04/24	S	G,P						✓					
6	117	0.0	0.1	9/04/24	S	G,P		✓									
7	117	0.3	-	9/04/24	S	G,P		✓									
8	118	0.0	0.1	9/04/24	S	G,P				✓							
9	118	0.3	-	9/04/24	S	G,P	✓										
10	118	0.5	-	9/04/24	S	G,P	✓										
11	119	0.0	0.1	9/04/24	S	G,P				✓							
12	119	0.5	-	9/04/24	S	G,P						✓					
13	D3/MJD	-	-	9/04/24	S	G,P			✓				/				
14/15	TS 2024.04.09 TB 2024.04.09			9/4/24	S	G							/				TS | TB

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

ENVIROLAB

Job No: 348566
Date Received: 9/4/24
Time Received: 1055
Received By: ST
Temp: Cooled/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Metals to analyse:	As, Cd, Cr, Cu, Hg, Ni, Zn, Pb, Fe, Mn, Be, B, Mo, Se	**LAB RECEIPT**	
Number of samples in container:	13	**Transported to laboratory by:**	**Lab Ref. No:**
Send results to:	Douglas Partners Pty Ltd		**Received by:**
Address:	15 Callistemon Close, Warabrook NSW 23	**Phone:** (02) 4960 9600	**Date & Tim**
Relinquished by:		**Date:** **Signed:**	**Signed:**

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Newcastle
Attention	Jason Lambert

Sample Login Details

Your reference	226269.01, Williamtown
Envirolab Reference	346423
Date Sample Received	14/03/2024
Date Instructions Received	14/03/2024
Date Results Expected to be Reported	21/03/2024

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	5 Water, 2 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	3
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

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12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
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Sample ID	VOCs in water	vTRH(C6-C10)/BTEXN in Water	svTRH (C10-C40) in Water	PAHs in Water	All metals in water-dissolved	PFAS in Water TRACE Short	vTRH(C6-C10)/BTEXN in Soil
101	✓	✓	✓	✓	✓	✓	
102	✓	✓	✓	✓	✓	✓	
D1/SCC	✓	✓	✓	✓	✓	✓	
TSW1		✓					
TBW1		✓					
TSS1							✓
TBS1							✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

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customerservice@envirolab.com.au
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SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Newcastle
Attention	Jason Lambert

Sample Login Details

Your reference	226269.01, Williamtown
Envirolab Reference	346566
Date Sample Received	15/03/2024
Date Instructions Received	15/03/2024
Date Results Expected to be Reported	22/03/2024

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	22 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	4
Cooling Method	Ice
Sampling Date Provided	Not Provided on the COC

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

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Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBs in Soil	Arsenic	Cadmium	Chromium	Copper	Mercury	Nickel	Zinc	Lead	Iron	Manganese	Beryllium	Boron	Molybdenum	Selenium	Misc Soil - Inorg	Misc Inorg - Soil	CEC	PFAS in Soils Short	Asbestos ID - soils NEPM
103-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
103-0.4	✓	✓	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓		
104-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓
104-0.5	✓	✓	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
104-0.9	✓	✓	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
105-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓
105-0.5	✓	✓	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
106-0-0.2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓
106-0.45	✓	✓	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓	
107-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓
107-0.4	✓	✓	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
108-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓
108-0.5	✓	✓	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓		
109-0-0.1	✓	✓	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
110-0-0.1	✓	✓	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓	
110-0.3																						✓	✓		
111-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓
111-0.5	✓	✓	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
111-0.7	✓	✓	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
112-0-0.1	✓	✓	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓	

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Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBs in Soil	Arsenic	Cadmium	Chromium	Copper	Mercury	Nickel	Zinc	Lead	Iron	Manganese	Beryllium	Boron	Molybdenum	Selenium	Misc Soil - Inorg	Misc Inorg - Soil	CEC	PFAS in Soils Short	Asbestos ID - soils NEPM
D1/LAH	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
D2/LAH	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt. Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

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SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Newcastle
Attention	Jason Lambert

Sample Login Details

Your reference	226269.01, Williamtown
Envirolab Reference	346566-A
Date Sample Received	15/03/2024
Date Instructions Received	03/04/2024
Date Results Expected to be Reported	10/04/2024

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	Additional analysis
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	4
Cooling Method	Ice
Sampling Date Provided	Not Provided on the COC

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

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Sample ID	TCLP Preparation - Acid	PAHs in TCLP (USEPA 1311)	PFAS in TCLP Short	On Hold
103-0-0.1				✓
103-0.4				✓
104-0-0.1				✓
104-0.5				✓
104-0.9				✓
105-0-0.1				✓
105-0.5	✓	✓		
106-0-0.2	✓	✓		
106-0.45	✓		✓	
107-0-0.1				✓
107-0.4				✓
108-0-0.1	✓		✓	
108-0.5				✓
109-0-0.1				✓
110-0-0.1	✓		✓	
110-0.3				✓
111-0-0.1				✓
111-0.5				✓
111-0.7				✓
112-0-0.1	✓		✓	
D1/LAH				✓
D2/LAH				✓
107 - [TRIPLICATE]-0-0.1				✓
D1/LAH - [TRIPLICATE]				✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

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12 Ashley St Chatswood NSW 2067
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customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Newcastle
Attention	Jason Lambert

Sample Login Details

Your reference	226269.01, Williamtown
Envirolab Reference	348566
Date Sample Received	11/04/2024
Date Instructions Received	11/04/2024
Date Results Expected to be Reported	18/04/2024

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	15 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	3
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

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ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	vTRH(C6-C10)/BTEXN in Soil	sVTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBs in Soil	Misc Soil - Inorg	Acid Extractable metalsin soil	Asbestos ID - soils NEPM	PFAS in Soils Short	CEC	Misc Inorg - Soil
113-0.5										✓	✓	✓
114-0.0-0.1	✓	✓	✓					✓	✓			
115-0.0-0.1	✓	✓	✓					✓	✓			
116-0.0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓			
116-0.9										✓		
117-0.0-0.1	✓	✓	✓					✓	✓			
117-0.3	✓	✓	✓					✓	✓			
118-0.0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓			
118-0.3	✓	✓	✓					✓				
118-0.5	✓	✓	✓					✓				
119-0.0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓			
119-0.5										✓		
D3/MJD	✓	✓	✓	✓	✓	✓	✓	✓				
TS/2024.04.09	✓											
TB/2024.04.09	✓											

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.

Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.

TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Newcastle
Attention	Jason Lambert

Sample Login Details

Your reference	226269.01, Williamtown
Envirolab Reference	348566-A
Date Sample Received	11/04/2024
Date Instructions Received	19/04/2024
Date Results Expected to be Reported	29/04/2024

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	Additional TCLP analysis
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	3
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

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Sample ID	TCLP Preparation - Acid	PAHs in TCLP (USEPA 1311)	Lead	PFAS in TCLP Short	On Hold
113-0.5					✓
114-0.0-0.1					✓
115-0.0-0.1					✓
116-0.0-0.1					✓
116-0.9					✓
117-0.0-0.1	✓	✓			
117-0.3					✓
118-0.0-0.1	✓	✓			
118-0.3					✓
118-0.5					✓
119-0.0-0.1	✓		✓		
119-0.5	✓			✓	
D3/MJD					✓
TS/2024.04.09					✓
TB/2024.04.09					✓
116 - [TRIPLICATE]-0.0-0.1					✓
119 - [TRIPLICATE]-0.0-0.1					✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

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CERTIFICATE OF ANALYSIS 346423

Client Details

Client	Douglas Partners Newcastle
Attention	Jason Lambert
Address	Box 324 Hunter Region Mail Centre, Newcastle, NSW, 2310

Sample Details

Your Reference	**226269.01, Williamtown**
Number of Samples	5 Water, 2 Soil
Date samples received	14/03/2024
Date completed instructions received	14/03/2024

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	21/03/2024
Date of Issue	21/03/2024

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Results Approved By
Dragana Tomas, Senior Chemist
Hannah Nguyen, Metals Supervisor
Sean McAlary, Chemist (FAS)
Steven Luong, Senior Chemist
Timothy Toll, Senior Chemist

Authorised By
Nancy Zhang, Laboratory Manager

VOCs in water				
Our Reference		346423-1	346423-2	346423-3
Your Reference	UNITS	101	102	D1/JCL
Date Sampled		13/03/2024	13/03/2024	13/03/2024
Type of sample		Water	Water	Water
Date Extracted	-	15/03/2024	15/03/2024	15/03/2024
Date Analysed	-	15/03/2024	15/03/2024	15/03/2024
Dichlorodifluoromethane	µg/L	<10	<10	<10
Chloromethane	µg/L	<10	<10	<10
Vinyl Chloride	µg/L	<10	<10	<10
Bromomethane	µg/L	<10	<10	<10
Chloroethane	µg/L	<10	<10	<10
Trichlorofluoromethane	µg/L	<10	<10	<10
1,1-Dichloroethene	µg/L	<1	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1	<1
1,1-dichloroethane	µg/L	<1	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1
Chloroform	µg/L	<1	<1	<1
2,2-dichloropropane	µg/L	<1	<1	<1
1,2-dichloroethane	µg/L	<1	<1	<1
1,1,1-trichloroethane	µg/L	<1	<1	<1
1,1-dichloropropene	µg/L	<1	<1	<1
Cyclohexane	µg/L	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1
Benzene	µg/L	<1	<1	<1
Dibromomethane	µg/L	<1	<1	<1
1,2-dichloropropane	µg/L	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1
Bromodichloromethane	µg/L	<1	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1	<1
Toluene	µg/L	<1	<1	<1
1,3-dichloropropane	µg/L	<1	<1	<1
Dibromochloromethane	µg/L	<1	<1	<1
1,2-dibromoethane	µg/L	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1	<1
Chlorobenzene	µg/L	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1

VOCs in water				
Our Reference		346423-1	346423-2	346423-3
Your Reference	UNITS	101	102	D1/JCL
Date Sampled		13/03/2024	13/03/2024	13/03/2024
Type of sample		Water	Water	Water
Bromoform	µg/L	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2
Styrene	µg/L	<1	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1	<1
o-xylene	µg/L	<1	<1	<1
1,2,3-trichloropropane	µg/L	<1	<1	<1
Isopropylbenzene	µg/L	<1	<1	<1
Bromobenzene	µg/L	<1	<1	<1
n-propyl benzene	µg/L	<1	<1	<1
2-chlorotoluene	µg/L	<1	<1	<1
4-chlorotoluene	µg/L	<1	<1	<1
1,3,5-trimethyl benzene	µg/L	<1	<1	<1
Tert-butyl benzene	µg/L	<1	<1	<1
1,2,4-trimethyl benzene	µg/L	<1	<1	<1
1,3-dichlorobenzene	µg/L	<1	<1	<1
Sec-butyl benzene	µg/L	<1	<1	<1
1,4-dichlorobenzene	µg/L	<1	<1	<1
4-isopropyl toluene	µg/L	<1	<1	<1
1,2-dichlorobenzene	µg/L	<1	<1	<1
n-butyl benzene	µg/L	<1	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1	<1
Hexachlorobutadiene	µg/L	<1	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1	<1
Surrogate Dibromofluoromethane	%	100	100	100
Surrogate Toluene-d8	%	100	99	100
Surrogate 4-Bromofluorobenzene	%	100	100	100

vTRH(C6-C10)/BTEXN in Water						
Our Reference		346423-1	346423-2	346423-3	346423-4	346423-5
Your Reference	UNITS	101	102	D1/JCL	TSW1	TBW1
Date Sampled		13/03/2024	13/03/2024	13/03/2024	13/03/2024	13/03/2024
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	15/03/2024	15/03/2024	15/03/2024	15/03/2024	18/03/2024
Date analysed	-	15/03/2024	15/03/2024	15/03/2024	15/03/2024	18/03/2024
TRH C_6 - C_9	µg/L	<10	<10	<10	[NA]	<10
TRH C_6 - C_{10}	µg/L	<10	<10	<10	[NA]	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10	<10	<10	[NA]	<10
Benzene	µg/L	<1	<1	<1	113%	<1
Toluene	µg/L	<1	<1	<1	113%	<1
Ethylbenzene	µg/L	<1	<1	<1	115%	<1
m+p-xylene	µg/L	<2	<2	<2	115%	<2
o-xylene	µg/L	<1	<1	<1	115%	<1
Naphthalene	µg/L	<1	<1	<1	[NA]	<1
Surrogate Dibromofluoromethane	%	100	100	100	100	102
Surrogate Toluene-d8	%	100	99	100	101	101
Surrogate 4-Bromofluorobenzene	%	100	100	100	99	102

svTRH (C10-C40) in Water				
Our Reference		346423-1	346423-2	346423-3
Your Reference	UNITS	101	102	D1/JCL
Date Sampled		13/03/2024	13/03/2024	13/03/2024
Type of sample		Water	Water	Water
Date extracted	-	15/03/2024	15/03/2024	15/03/2024
Date analysed	-	15/03/2024	15/03/2024	15/03/2024
TRH C_{10} - C_{14}	µg/L	<50	79	<50
TRH C_{15} - C_{28}	µg/L	<100	200	190
TRH C_{29} - C_{36}	µg/L	<100	<100	<100
Total +ve TRH (C10-C36)	µg/L	<50	280	190
TRH >C_{10} - C_{16}	µg/L	<50	93	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50	93	<50
TRH >C_{16} - C_{34}	µg/L	<100	200	190
TRH >C_{34} - C_{40}	µg/L	<100	<100	<100
Total +ve TRH (>C10-C40)	µg/L	<50	290	190
Surrogate o-Terphenyl	%	89	91	95

PAHs in Water				
Our Reference		346423-1	346423-2	346423-3
Your Reference	UNITS	101	102	D1/JCL
Date Sampled		13/03/2024	13/03/2024	13/03/2024
Type of sample		Water	Water	Water
Date extracted	-	15/03/2024	15/03/2024	15/03/2024
Date analysed	-	15/03/2024	15/03/2024	15/03/2024
Naphthalene	µg/L	<0.1	<0.1	<0.1
Acenaphthylene	µg/L	<0.1	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5	<0.5
Total +ve PAH's	µg/L	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d14	%	111	105	106

All metals in water-dissolved				
Our Reference	UNITS	346423-1	346423-2	346423-3
Your Reference		101	102	D1/JCL
Date Sampled		13/03/2024	13/03/2024	13/03/2024
Type of sample		Water	Water	Water
Date prepared	-	15/03/2024	15/03/2024	15/03/2024
Date analysed	-	15/03/2024	15/03/2024	15/03/2024
Arsenic-Dissolved	µg/L	1	9	9
Cadmium-Dissolved	µg/L	<0.1	<0.1	<0.1
Chromium-Dissolved	µg/L	<1	<1	<1
Copper-Dissolved	µg/L	5	2	<1
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05
Nickel-Dissolved	µg/L	18	7	6
Zinc-Dissolved	µg/L	330	40	39
Lead-Dissolved	µg/L	<1	<1	<1
Iron-Dissolved	µg/L	6,100	16,000	16,000
Manganese-Dissolved	µg/L	150	270	270
Beryllium-Dissolved	µg/L	<0.5	<0.5	<0.5
Boron-Dissolved	µg/L	50	220	230
Molybdenum-Dissolved	µg/L	<1	2	2
Barium-Dissolved	µg/L	7	20	19
Silver-Dissolved	µg/L	<1	<1	<1
Aluminium-Dissolved	µg/L	<10	<10	<10
Cobalt-Dissolved	µg/L	<1	2	2
Antimony-Dissolved	µg/L	<1	<1	<1
Selenium-Dissolved	µg/L	<1	<1	<1
Tin-Dissolved	µg/L	<1	<1	<1
Uranium-Dissolved	µg/L	<0.5	<0.5	<0.5

PFAS in Water TRACE Short				
Our Reference	UNITS	346423-1	346423-2	346423-3
Your Reference		101	102	D1/JCL
Date Sampled		13/03/2024	13/03/2024	13/03/2024
Type of sample		Water	Water	Water
Date prepared	-	15/03/2024	15/03/2024	15/03/2024
Date analysed	-	15/03/2024	15/03/2024	15/03/2024
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.020	0.014	0.014
Perfluorooctanesulfonic acid PFOS	µg/L	0.0007	0.012	0.012
Perfluorooctanoic acid PFOA	µg/L	0.002	0.019	0.020
6:2 FTS	µg/L	<0.0004	<0.0004	<0.0004
8:2 FTS	µg/L	<0.0004	<0.0004	<0.0004
Surrogate $^{13}C_8$ *PFOS*	%	100	100	95
Surrogate $^{13}C_2$ *PFOA*	%	100	98	98
Extracted ISTD $^{18}O_2$ *PFHxS*	%	82	80	75
Extracted ISTD $^{13}C_4$ *PFOS*	%	81	81	78
Extracted ISTD $^{13}C_4$ *PFOA*	%	96	78	68
Extracted ISTD $^{13}C_2$ *6:2FTS*	%	155	#	198
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	162	149	162
Total Positive PFHxS & PFOS	µg/L	0.020	0.026	0.026
Total Positive PFOS & PFOA	µg/L	0.0026	0.031	0.032
Total Positive PFAS	µg/L	0.022	0.045	0.046

vTRH(C6-C10)/BTEXN in Soil			
Our Reference	UNITS	346423-6	346423-7
Your Reference		TSS1	TBS1
Date Sampled		13/03/2024	13/03/2024
Type of sample		Soil	Soil
Date extracted	-	19/03/2024	19/03/2024
Date analysed	-	20/03/2024	20/03/2024
TRH C_6 - C_9	mg/kg	[NA]	<25
TRH C_6 - C_{10}	mg/kg	[NA]	<25
vTRH C_6 - C_{10} less BTEX (F1)	mg/kg	[NA]	<25
Benzene	mg/kg	103%	<0.2
Toluene	mg/kg	103%	<0.5
Ethylbenzene	mg/kg	102%	<1
m+p-xylene	mg/kg	102%	<2
o-Xylene	mg/kg	103%	<1
Naphthalene	mg/kg	[NA]	<1
Total +ve Xylenes	mg/kg	[NA]	<1
Surrogate aaa-Trifluorotoluene	%	103	84

Method ID	Methodology Summary
Metals-021	Determination of Mercury by Cold Vapour AAS.
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. Salt forms (e.g. FeO, PbO, ZnO) are determinined stoichiometrically from the base metal concentration.
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.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly 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 is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

Method ID	Methodology Summary
Org-029	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLPs/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.4 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

QUALITY CONTROL: VOCs in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date Extracted	-			15/03/2024	1	15/03/2024	18/03/2024		15/03/2024	[NT]
Date Analysed	-			15/03/2024	1	15/03/2024	18/03/2024		15/03/2024	[NT]
Dichlorodifluoromethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Chloromethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Bromomethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Chloroethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	105	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Chloroform	µg/L	1	Org-023	<1	1	<1	<1	0	105	[NT]
2,2-dichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	104	[NT]
1,1,1-trichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	104	[NT]
1,1-dichloropropene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Cyclohexane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Benzene	µg/L	1	Org-023	<1	1	<1	<1	0	107	[NT]
Dibromomethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Trichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	113	[NT]
Bromodichloromethane	µg/L	1	Org-023	<1	1	<1	<1	0	108	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Toluene	µg/L	1	Org-023	<1	1	<1	<1	0	108	[NT]
1,3-dichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-023	<1	1	<1	<1	0	108	[NT]
1,2-dibromoethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	106	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	111	[NT]
Bromoform	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
m+p-xylene	µg/L	2	Org-023	<2	1	<2	<2	0	111	[NT]
Styrene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]

QUALITY CONTROL: VOCs in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
o-xylene	µg/L	1	Org-023	<1	1	<1	<1	0	111	[NT]
1,2,3-trichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Isopropylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Bromobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
n-propyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,3,5-trimethyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Tert-butyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,4-trimethyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Sec-butyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
4-isopropyl toluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
n-butyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	102	1	100	102	2	95	[NT]
Surrogate Toluene-d8	%		Org-023	99	1	100	100	0	100	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	102	1	100	101	1	103	[NT]

QUALITY CONTROL: VOCs in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date Extracted	-			[NT]	[NT]	[NT]	[NT]	[NT]	15/03/2024	[NT]
Date Analysed	-			[NT]	[NT]	[NT]	[NT]	[NT]	15/03/2024	[NT]
1,1-dichloroethane	µg/L	1	Org-023	[NT]	[NT]	[NT]	[NT]	[NT]	109	[NT]
Chloroform	µg/L	1	Org-023	[NT]	[NT]	[NT]	[NT]	[NT]	111	[NT]
1,2-dichloroethane	µg/L	1	Org-023	[NT]	[NT]	[NT]	[NT]	[NT]	111	[NT]
1,1,1-trichloroethane	µg/L	1	Org-023	[NT]	[NT]	[NT]	[NT]	[NT]	108	[NT]
Benzene	µg/L	1	Org-023	[NT]	[NT]	[NT]	[NT]	[NT]	113	[NT]
Trichloroethene	µg/L	1	Org-023	[NT]	[NT]	[NT]	[NT]	[NT]	120	[NT]
Bromodichloromethane	µg/L	1	Org-023	[NT]	[NT]	[NT]	[NT]	[NT]	107	[NT]
Toluene	µg/L	1	Org-023	[NT]	[NT]	[NT]	[NT]	[NT]	112	[NT]
Dibromochloromethane	µg/L	1	Org-023	[NT]	[NT]	[NT]	[NT]	[NT]	106	[NT]
Tetrachloroethene	µg/L	1	Org-023	[NT]	[NT]	[NT]	[NT]	[NT]	111	[NT]
Ethylbenzene	µg/L	1	Org-023	[NT]	[NT]	[NT]	[NT]	[NT]	112	[NT]
m+p-xylene	µg/L	2	Org-023	[NT]	[NT]	[NT]	[NT]	[NT]	113	[NT]
o-xylene	µg/L	1	Org-023	[NT]	[NT]	[NT]	[NT]	[NT]	113	[NT]
Surrogate Dibromofluoromethane	%		Org-023	[NT]	[NT]	[NT]	[NT]	[NT]	88	[NT]
Surrogate Toluene-d8	%		Org-023	[NT]	[NT]	[NT]	[NT]	[NT]	102	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	[NT]	[NT]	[NT]	[NT]	[NT]	99	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			15/03/2024	1	15/03/2024	18/03/2024		15/03/2024	[NT]
Date analysed	-			15/03/2024	1	15/03/2024	18/03/2024		15/03/2024	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	1	<10	<10	0	110	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	1	<10	<10	0	110	[NT]
Benzene	µg/L	1	Org-023	<1	1	<1	<1	0	107	[NT]
Toluene	µg/L	1	Org-023	<1	1	<1	<1	0	108	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	111	[NT]
m+p-xylene	µg/L	2	Org-023	<2	1	<2	<2	0	111	[NT]
o-xylene	µg/L	1	Org-023	<1	1	<1	<1	0	111	[NT]
Naphthalene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	102	1	100	102	2	95	[NT]
Surrogate Toluene-d8	%		Org-023	99	1	100	100	0	100	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	102	1	100	101	1	103	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			[NT]	[NT]	[NT]	[NT]	[NT]	15/03/2024	[NT]
Date analysed	-			[NT]	[NT]	[NT]	[NT]	[NT]	15/03/2024	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	[NT]	[NT]	[NT]	[NT]	[NT]	113	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	[NT]	[NT]	[NT]	[NT]	[NT]	113	[NT]
Benzene	µg/L	1	Org-023	[NT]	[NT]	[NT]	[NT]	[NT]	113	[NT]
Toluene	µg/L	1	Org-023	[NT]	[NT]	[NT]	[NT]	[NT]	112	[NT]
Ethylbenzene	µg/L	1	Org-023	[NT]	[NT]	[NT]	[NT]	[NT]	112	[NT]
m+p-xylene	µg/L	2	Org-023	[NT]	[NT]	[NT]	[NT]	[NT]	113	[NT]
o-xylene	µg/L	1	Org-023	[NT]	[NT]	[NT]	[NT]	[NT]	113	[NT]
Surrogate Dibromofluoromethane	%		Org-023	[NT]	[NT]	[NT]	[NT]	[NT]	88	[NT]
Surrogate Toluene-d8	%		Org-023	[NT]	[NT]	[NT]	[NT]	[NT]	102	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	[NT]	[NT]	[NT]	[NT]	[NT]	99	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	346423-2
Date extracted	-			15/03/2024	1	15/03/2024	15/03/2024		15/03/2024	15/03/2024
Date analysed	-			15/03/2024	1	15/03/2024	15/03/2024		15/03/2024	15/03/2024
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	1	<50	<50	0	105	114
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	1	<100	<100	0	105	120
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	1	<100	<100	0	100	74
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	1	<50	<50	0	105	114
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	1	<100	<100	0	105	120
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	1	<100	<100	0	100	74
Surrogate o-Terphenyl	%		Org-020	81	1	89	90	1	87	104

QUALITY CONTROL: PAHs in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	346423-2
Date extracted	-			15/03/2024	1	15/03/2024	15/03/2024		15/03/2024	15/03/2024
Date analysed	-			15/03/2024	1	15/03/2024	15/03/2024		15/03/2024	15/03/2024
Naphthalene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	107	108
Acenaphthylene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	84	87
Fluorene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	93	93
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	91	107
Anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	95	107
Pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	95	105
Benzo(a)anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	67	68
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	88	90
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	83	1	111	116	4	95	109

QUALITY CONTROL: All metals in water-dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	346423-2
Date prepared	-			15/03/2024	1	15/03/2024	15/03/2024		15/03/2024	15/03/2024
Date analysed	-			15/03/2024	1	15/03/2024	15/03/2024		15/03/2024	15/03/2024
Arsenic-Dissolved	µg/L	1	Metals-022	<1	1	1	[NT]		90	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	1	<0.1	[NT]		85	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	1	<1	[NT]		90	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	1	5	[NT]		88	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	1	<0.05	<0.05	0	91	92
Nickel-Dissolved	µg/L	1	Metals-022	<1	1	18	[NT]		90	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	1	330	[NT]		92	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	1	<1	[NT]		89	[NT]
Iron-Dissolved	µg/L	10	Metals-022	<10	1	6100	[NT]		91	[NT]
Manganese-Dissolved	µg/L	5	Metals-022	<5	1	150	[NT]		90	[NT]
Beryllium-Dissolved	µg/L	0.5	Metals-022	<0.5	1	<0.5	[NT]		86	[NT]
Boron-Dissolved	µg/L	20	Metals-022	<20	1	50	[NT]		84	[NT]
Molybdenum-Dissolved	µg/L	1	Metals-022	<1	1	<1	[NT]		83	[NT]
Barium-Dissolved	µg/L	1	Metals-022	<1	1	7	[NT]		91	[NT]
Silver-Dissolved	µg/L	1	Metals-022	<1	1	<1	[NT]		87	[NT]
Aluminium-Dissolved	µg/L	10	Metals-022	<10	1	<10	[NT]		91	[NT]
Cobalt-Dissolved	µg/L	1	Metals-022	<1	1	<1	[NT]		88	[NT]
Antimony-Dissolved	µg/L	1	Metals-022	<1	1	<1	[NT]		85	[NT]
Selenium-Dissolved	µg/L	1	Metals-022	<1	1	<1	[NT]		90	[NT]
Tin-Dissolved	µg/L	1	Metals-022	<1	1	<1	[NT]		82	[NT]
Uranium-Dissolved	µg/L	0.5	Metals-022	<0.5	1	<0.5	[NT]		85	[NT]

QUALITY CONTROL: PFAS in Water TRACE Short						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			15/03/2024	[NT]	[NT]	[NT]	[NT]	15/03/2024	[NT]
Date analysed	-			15/03/2024	[NT]	[NT]	[NT]	[NT]	15/03/2024	[NT]
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.0002	Org-029	<0.0002	[NT]	[NT]	[NT]	[NT]	99	[NT]
Perfluorooctanesulfonic acid PFOS	µg/L	0.0002	Org-029	<0.0002	[NT]	[NT]	[NT]	[NT]	105	[NT]
Perfluorooctanoic acid PFOA	µg/L	0.0002	Org-029	<0.0002	[NT]	[NT]	[NT]	[NT]	99	[NT]
6:2 FTS	µg/L	0.0004	Org-029	<0.0004	[NT]	[NT]	[NT]	[NT]	96	[NT]
8:2 FTS	µg/L	0.0004	Org-029	<0.0004	[NT]	[NT]	[NT]	[NT]	103	[NT]
Surrogate $^{13}C_8$ *PFOS*	%		Org-029	98	[NT]	[NT]	[NT]	[NT]	101	[NT]
Surrogate $^{13}C_2$ *PFOA*	%		Org-029	99	[NT]	[NT]	[NT]	[NT]	100	[NT]
Extracted ISTD $^{18}O_2$ *PFHxS*	%		Org-029	82	[NT]	[NT]	[NT]	[NT]	79	[NT]
Extracted ISTD $^{13}C_4$ *PFOS*	%		Org-029	72	[NT]	[NT]	[NT]	[NT]	68	[NT]
Extracted ISTD $^{13}C_4$ *PFOA*	%		Org-029	91	[NT]	[NT]	[NT]	[NT]	85	[NT]
Extracted ISTD $^{13}C_2$ *6:2FTS*	%		Org-029	118	[NT]	[NT]	[NT]	[NT]	108	[NT]
Extracted ISTD $^{13}C_2$ *8:2FTS*	%		Org-029	141	[NT]	[NT]	[NT]	[NT]	140	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-24	[NT]
Date extracted	-			19/03/2024	[NT]	[NT]	[NT]	[NT]	19/03/2024	[NT]
Date analysed	-			20/03/2024	[NT]	[NT]	[NT]	[NT]	20/03/2024	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	97	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	97	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	[NT]	[NT]	[NT]	[NT]	98	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	[NT]	[NT]	[NT]	[NT]	93	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	88	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	102	[NT]
o-Xylene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Naphthalene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	89	[NT]	[NT]	[NT]	[NT]	107	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

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

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

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

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

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

For PFAS Extracted Internal Standards denoted with # or 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).

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CERTIFICATE OF ANALYSIS 346566

Client Details

Client	Douglas Partners Newcastle
Attention	Jason Lambert
Address	Box 324 Hunter Region Mail Centre, Newcastle, NSW, 2310

Sample Details

Your Reference	**226269.01, Williamtown**
Number of Samples	22 Soil
Date samples received	15/03/2024
Date completed instructions received	15/03/2024

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	22/03/2024
Date of Issue	22/03/2024

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vTRH(C6-C10)/BTEXN in Soil						
Our Reference		346566-1	346566-2	346566-3	346566-4	346566-5
Your Reference	UNITS	103	103	104	104	104
Depth		0-0.1	0.4	0-0.1	0.5	0.9
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	18/03/2024	18/03/2024	18/03/2024	18/03/2024	18/03/2024
Date analysed	-	21/03/2024	21/03/2024	21/03/2024	21/03/2024	21/03/2024
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	79	84	87	85	84

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		346566-6	346566-7	346566-8	346566-9	346566-10
Your Reference	UNITS	105	105	106	106	107
Depth		0-0.1	0.5	0-0.2	0.45	0-0.1
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	18/03/2024	18/03/2024	18/03/2024	18/03/2024	18/03/2024
Date analysed	-	21/03/2024	21/03/2024	21/03/2024	21/03/2024	21/03/2024
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	86	83	88	86	87

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		346566-11	346566-12	346566-13	346566-14	346566-15
Your Reference	UNITS	107	108	108	109	110
Depth		0.4	0-0.1	0.5	0-0.1	0-0.1
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	18/03/2024	18/03/2024	18/03/2024	18/03/2024	18/03/2024
Date analysed	-	21/03/2024	21/03/2024	21/03/2024	21/03/2024	21/03/2024
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	82	80	81	78	81

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		346566-17	346566-18	346566-19	346566-20	346566-21
Your Reference	UNITS	111	111	111	112	D1/LAH
Depth		0-0.1	0.5	0.7	0-0.1	-
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	18/03/2024	18/03/2024	18/03/2024	18/03/2024	18/03/2024
Date analysed	-	21/03/2024	21/03/2024	21/03/2024	21/03/2024	21/03/2024
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	83	82	84	76	80

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		346566-22
Your Reference	UNITS	D2/LAH
Depth		-
Type of sample		Soil
Date extracted	-	18/03/2024
Date analysed	-	21/03/2024
TRH C_6 - C_9	mg/kg	<25
TRH C_6 - C_{10}	mg/kg	<25
vTRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
Naphthalene	mg/kg	<1
Total +ve Xylenes	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	86

svTRH (C10-C40) in Soil						
Our Reference		346566-1	346566-2	346566-3	346566-4	346566-5
Your Reference	UNITS	103	103	104	104	104
Depth		0-0.1	0.4	0-0.1	0.5	0.9
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	18/03/2024	18/03/2024	18/03/2024	18/03/2024	18/03/2024
Date analysed	-	18/03/2024	18/03/2024	18/03/2024	18/03/2024	18/03/2024
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	140	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	160	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	290	<50	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} -C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	240	<100	<100	100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	240	<50	<50	100	<50
Surrogate o-Terphenyl	%	90	89	84	86	87

svTRH (C10-C40) in Soil						
Our Reference		346566-6	346566-7	346566-8	346566-9	346566-10
Your Reference	UNITS	105	105	106	106	107
Depth		0-0.1	0.5	0-0.2	0.45	0-0.1
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	18/03/2024	18/03/2024	18/03/2024	18/03/2024	18/03/2024
Date analysed	-	18/03/2024	19/03/2024	19/03/2024	19/03/2024	19/03/2024
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	120	200	380	<100	<100
TRH C_{29} - C_{36}	mg/kg	150	180	480	<100	<100
Total +ve TRH (C10-C36)	mg/kg	270	380	850	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} -C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	230	330	740	<100	100
TRH >C_{34} -C_{40}	mg/kg	<100	100	250	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	230	430	1,000	<50	100
Surrogate o-Terphenyl	%	88	90	88	84	89

svTRH (C10-C40) in Soil						
Our Reference		346566-11	346566-12	346566-13	346566-14	346566-15
Your Reference	UNITS	107	108	108	109	110
Depth		0.4	0-0.1	0.5	0-0.1	0-0.1
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	18/03/2024	18/03/2024	18/03/2024	18/03/2024	18/03/2024
Date analysed	-	19/03/2024	19/03/2024	19/03/2024	19/03/2024	19/03/2024
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	120	<100	<100	120
TRH C_{29} - C_{36}	mg/kg	<100	140	<100	<100	150
Total +ve TRH (C10-C36)	mg/kg	<50	260	<50	<50	270
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} -C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	220	<100	140	220
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	220	<50	140	220
Surrogate o-Terphenyl	%	84	87	88	88	88

svTRH (C10-C40) in Soil						
Our Reference		346566-17	346566-18	346566-19	346566-20	346566-21
Your Reference	UNITS	111	111	111	112	D1/LAH
Depth		0-0.1	0.5	0.7	0-0.1	-
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	18/03/2024	18/03/2024	18/03/2024	18/03/2024	18/03/2024
Date analysed	-	19/03/2024	19/03/2024	19/03/2024	19/03/2024	19/03/2024
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	100	120	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	240	150	<100	<100	110
Total +ve TRH (C10-C36)	mg/kg	340	270	<50	<50	110
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} -C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	240	220	<100	<100	170
TRH >C_{34} -C_{40}	mg/kg	150	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	390	220	<50	<50	170
Surrogate o-Terphenyl	%	89	92	94	106	87

svTRH (C10-C40) in Soil		
Our Reference		346566-22
Your Reference	UNITS	D2/LAH
Depth		-
Type of sample		Soil
Date extracted	-	18/03/2024
Date analysed	-	19/03/2024
TRH C_{10} - C_{14}	mg/kg	<50
TRH C_{15} - C_{28}	mg/kg	<100
TRH C_{29} - C_{36}	mg/kg	120
Total +ve TRH (C10-C36)	mg/kg	120
TRH >C_{10} -C_{16}	mg/kg	<50
TRH >C_{10} -C_{16} less Naphthalene (F2)	mg/kg	<50
TRH >C_{16} -C_{34}	mg/kg	170
TRH >C_{34} -C_{40}	mg/kg	<100
Total +ve TRH (>C10-C40)	mg/kg	170
Surrogate o-Terphenyl	%	92

PAHs in Soil						
Our Reference		346566-1	346566-2	346566-3	346566-4	346566-5
Your Reference	UNITS	103	103	104	104	104
Depth		0-0.1	0.4	0-0.1	0.5	0.9
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	18/03/2024	18/03/2024	18/03/2024	18/03/2024	18/03/2024
Date analysed	-	18/03/2024	18/03/2024	18/03/2024	18/03/2024	18/03/2024
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.2	<0.1	0.2	0.2	<0.1
Pyrene	mg/kg	0.2	<0.1	0.1	0.2	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.09	<0.05	0.09	0.09	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	0.4	<0.05	0.4	0.5	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	110	108	97	104	103

PAHs in Soil						
Our Reference		346566-6	346566-7	346566-8	346566-9	346566-10
Your Reference	UNITS	105	105	106	106	107
Depth		0-0.1	0.5	0-0.2	0.45	0-0.1
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	18/03/2024	18/03/2024	18/03/2024	18/03/2024	18/03/2024
Date analysed	-	18/03/2024	18/03/2024	18/03/2024	18/03/2024	18/03/2024
Naphthalene	mg/kg	<0.1	0.4	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	0.9	0.4	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	0.4	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	0.8	0.2	<0.1	<0.1
Phenanthrene	mg/kg	0.2	12	2.4	<0.1	<0.1
Anthracene	mg/kg	<0.1	2.5	0.7	<0.1	<0.1
Fluoranthene	mg/kg	0.5	14	2.7	0.1	0.1
Pyrene	mg/kg	0.5	12	2.6	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.2	3.9	1.2	<0.1	<0.1
Chrysene	mg/kg	0.2	4.0	1.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	0.4	6.9	2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.3	4.2	1.4	0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	2.7	0.6	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	0.6	0.2	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.2	3.3	0.8	<0.1	<0.1
Total +ve PAH's	mg/kg	2.4	69	16	0.2	0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	6.2	1.9	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	6.2	1.9	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	6.2	1.9	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	109	93	97	96	99

PAHs in Soil						
Our Reference		346566-11	346566-12	346566-13	346566-14	346566-15
Your Reference	UNITS	107	108	108	109	110
Depth		0.4	0-0.1	0.5	0-0.1	0-0.1
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	18/03/2024	18/03/2024	18/03/2024	18/03/2024	18/03/2024
Date analysed	-	18/03/2024	18/03/2024	18/03/2024	18/03/2024	18/03/2024
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	0.2	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	0.6	<0.1	0.1	<0.1
Pyrene	mg/kg	<0.1	0.5	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	0.2	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	0.2	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	0.4	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	0.3	<0.05	0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	0.2	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	0.2	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	2.8	<0.05	0.2	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	93	94	106	96	101

PAHs in Soil						
Our Reference		346566-17	346566-18	346566-19	346566-20	346566-21
Your Reference	UNITS	111	111	111	112	D1/LAH
Depth		0-0.1	0.5	0.7	0-0.1	-
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	18/03/2024	18/03/2024	18/03/2024	18/03/2024	18/03/2024
Date analysed	-	18/03/2024	18/03/2024	19/03/2024	19/03/2024	19/03/2024
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.4
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	0.1	<0.1	<0.1	0.7
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.7
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	0.5
Benzo(a)pyrene	mg/kg	<0.05	0.05	<0.05	<0.05	0.3
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
Total +ve PAH's	mg/kg	0.1	0.2	<0.05	<0.05	3.4
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	0.5
Surrogate p-Terphenyl-d14	%	96	96	110	109	94

PAHs in Soil		
Our Reference		346566-22
Your Reference	UNITS	D2/LAH
Depth		-
Type of sample		Soil
Date extracted	-	18/03/2024
Date analysed	-	19/03/2024
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	0.4
Pyrene	mg/kg	0.4
Benzo(a)anthracene	mg/kg	0.1
Chrysene	mg/kg	0.1
Benzo(b,j+k)fluoranthene	mg/kg	0.3
Benzo(a)pyrene	mg/kg	0.2
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	0.2
Total +ve PAH's	mg/kg	1.9
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5
Surrogate p-Terphenyl-d14	%	103

Organochlorine Pesticides in soil						
Our Reference		346566-1	346566-3	346566-6	346566-8	346566-10
Your Reference	UNITS	103	104	105	106	107
Depth		0-0.1	0-0.1	0-0.1	0-0.2	0-0.1
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	18/03/2024	18/03/2024	18/03/2024	18/03/2024	18/03/2024
Date analysed	-	18/03/2024	18/03/2024	18/03/2024	18/03/2024	18/03/2024
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate 4-Chloro-3-NBTF	%	103	95	97	95	93

Organochlorine Pesticides in soil					
Our Reference		346566-12	346566-17	346566-21	346566-22
Your Reference	UNITS	108	111	D1/LAH	D2/LAH
Depth		0-0.1	0-0.1	-	-
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	18/03/2024	18/03/2024	18/03/2024	18/03/2024
Date analysed	-	18/03/2024	18/03/2024	19/03/2024	19/03/2024
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate 4-Chloro-3-NBTF	%	96	96	94	98

Organophosphorus Pesticides in Soil						
Our Reference		346566-1	346566-3	346566-6	346566-8	346566-10
Your Reference	UNITS	103	104	105	106	107
Depth		0-0.1	0-0.1	0-0.1	0-0.2	0-0.1
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	18/03/2024	18/03/2024	18/03/2024	18/03/2024	18/03/2024
Date analysed	-	18/03/2024	18/03/2024	18/03/2024	18/03/2024	18/03/2024
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Mevinphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phorate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Disulfoton	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion-Methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenthion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methidathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenamiphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phosalone	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Coumaphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate 4-Chloro-3-NBTF	%	103	95	97	95	93

Organophosphorus Pesticides in Soil					
Our Reference		346566-12	346566-17	346566-21	346566-22
Your Reference	UNITS	108	111	D1/LAH	D2/LAH
Depth		0-0.1	0-0.1	-	-
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	18/03/2024	18/03/2024	18/03/2024	18/03/2024
Date analysed	-	18/03/2024	18/03/2024	19/03/2024	19/03/2024
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1
Mevinphos	mg/kg	<0.1	<0.1	<0.1	<0.1
Phorate	mg/kg	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1
Disulfoton	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Parathion-Methyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1
Fenthion	mg/kg	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Methidathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Fenamiphos	mg/kg	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1
Phosalone	mg/kg	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1
Coumaphos	mg/kg	<0.1	<0.1	<0.1	0.1
Surrogate 4-Chloro-3-NBTF	%	96	96	94	98

PCBs in Soil						
Our Reference		346566-1	346566-3	346566-6	346566-8	346566-10
Your Reference	UNITS	103	104	105	106	107
Depth		0-0.1	0-0.1	0-0.1	0-0.2	0-0.1
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	18/03/2024	18/03/2024	18/03/2024	18/03/2024	18/03/2024
Date analysed	-	18/03/2024	18/03/2024	18/03/2024	18/03/2024	18/03/2024
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate 2-Fluorobiphenyl	%	113	104	108	104	102

PCBs in Soil					
Our Reference		346566-12	346566-17	346566-21	346566-22
Your Reference	UNITS	108	111	D1/LAH	D2/LAH
Depth		0-0.1	0-0.1	-	-
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	18/03/2024	18/03/2024	18/03/2024	18/03/2024
Date analysed	-	18/03/2024	18/03/2024	19/03/2024	19/03/2024
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate 2-Fluorobiphenyl	%	106	106	104	108

Acid Extractable metals in soil						
Our Reference		346566-1	346566-2	346566-3	346566-4	346566-5
Your Reference	UNITS	103	103	104	104	104
Depth		0-0.1	0.4	0-0.1	0.5	0.9
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/03/2024	15/03/2024	15/03/2024	15/03/2024	15/03/2024
Date analysed	-	20/03/2024	20/03/2024	20/03/2024	20/03/2024	20/03/2024
Arsenic	mg/kg	5	16	6	7	5
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	25	37	13	12	22
Copper	mg/kg	18	12	12	9	4
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	19	28	9	7	17
Zinc	mg/kg	130	47	100	96	33
Lead	mg/kg	13	6	34	22	3
Iron	mg/kg	25,000	72,000	14,000	16,000	33,000
Manganese	mg/kg	93	160	150	150	99
Beryllium	mg/kg	<1	1	<1	<1	<1
Boron	mg/kg	<10	<10	<20	<10	<10
Molybdenum	mg/kg	<1	<1	<1	<1	<1
Selenium	mg/kg	<2	3	<2	<2	<2

Acid Extractable metals in soil						
Our Reference		346566-6	346566-7	346566-8	346566-9	346566-10
Your Reference	UNITS	105	105	106	106	107
Depth		0-0.1	0.5	0-0.2	0.45	0-0.1
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/03/2024	15/03/2024	15/03/2024	15/03/2024	15/03/2024
Date analysed	-	20/03/2024	20/03/2024	20/03/2024	20/03/2024	20/03/2024
Arsenic	mg/kg	<4	<4	4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	10	11	16	22	18
Copper	mg/kg	11	12	28	13	10
Mercury	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1
Nickel	mg/kg	5	7	7	12	9
Zinc	mg/kg	68	70	160	32	41
Lead	mg/kg	27	27	69	10	9
Iron	mg/kg	9,000	8,600	14,000	15,000	13,000
Manganese	mg/kg	77	70	780	39	66
Beryllium	mg/kg	<1	<1	<1	<1	<1
Boron	mg/kg	<10	<10	<10	<10	<10
Molybdenum	mg/kg	<1	<1	<1	<1	<1
Selenium	mg/kg	<2	<2	<2	<2	<2

Acid Extractable metals in soil						
Our Reference		346566-11	346566-12	346566-13	346566-14	346566-15
Your Reference	UNITS	107	108	108	109	110
Depth		0.4	0-0.1	0.5	0-0.1	0-0.1
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/03/2024	15/03/2024	15/03/2024	15/03/2024	15/03/2024
Date analysed	-	20/03/2024	20/03/2024	20/03/2024	20/03/2024	20/03/2024
Arsenic	mg/kg	<4	<4	7	8	8
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	15	30	39	27	27
Copper	mg/kg	8	14	9	13	10
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	7	12	18	20	19
Zinc	mg/kg	25	51	32	74	53
Lead	mg/kg	4	12	8	9	7
Iron	mg/kg	7,600	11,000	31,000	39,000	53,000
Manganese	mg/kg	56	2,300	43	180	200
Beryllium	mg/kg	<1	2	<1	<1	<1
Boron	mg/kg	<10	10	<10	<10	<10
Molybdenum	mg/kg	<1	<1	2	<1	<1
Selenium	mg/kg	<2	2	3	3	3

Acid Extractable metals in soil						
Our Reference		346566-17	346566-18	346566-19	346566-20	346566-21
Your Reference	UNITS	111	111	111	112	D1/LAH
Depth		0-0.1	0.5	0.7	0-0.1	-
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/03/2024	15/03/2024	15/03/2024	15/03/2024	15/03/2024
Date analysed	-	20/03/2024	20/03/2024	20/03/2024	20/03/2024	20/03/2024
Arsenic	mg/kg	7	7	20	7	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	26	29	35	26	17
Copper	mg/kg	16	19	9	12	15
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	20	22	27	19	9
Zinc	mg/kg	68	72	45	51	95
Lead	mg/kg	9	10	6	9	38
Iron	mg/kg	52,000	29,000	150,000	69,000	13,000
Manganese	mg/kg	170	190	200	140	200
Beryllium	mg/kg	<1	<1	1	<1	<1
Boron	mg/kg	<10	<10	<10	<10	<10
Molybdenum	mg/kg	<1	<1	1	<1	<1
Selenium	mg/kg	3	3	8	3	<2

Acid Extractable metals in soil				
Our Reference		346566-22	346566-23	346566-24
Your Reference	UNITS	D2/LAH	107 - [TRIPLICATE]	D1/LAH - [TRIPLICATE]
Depth		-	0-0.1	-
Type of sample		Soil	Soil	Soil
Date prepared	-	15/03/2024	15/03/2024	15/03/2024
Date analysed	-	20/03/2024	20/03/2024	20/03/2024
Arsenic	mg/kg	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4
Chromium	mg/kg	26	18	14
Copper	mg/kg	12	10	18
Mercury	mg/kg	<0.1	<0.1	0.1
Nickel	mg/kg	10	9	7
Zinc	mg/kg	44	45	110
Lead	mg/kg	10	9	53
Iron	mg/kg	9,400	12,000	11,000
Manganese	mg/kg	1,000	78	160
Beryllium	mg/kg	1	<1	<1
Boron	mg/kg	<10	<10	<10
Molybdenum	mg/kg	<1	<1	<1
Selenium	mg/kg	<2	<2	<2

Misc Soil - Inorg						
Our Reference		346566-1	346566-3	346566-6	346566-8	346566-10
Your Reference	UNITS	103	104	105	106	107
Depth		0-0.1	0-0.1	0-0.1	0-0.2	0-0.1
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	18/03/2024	18/03/2024	18/03/2024	18/03/2024	18/03/2024
Date analysed	-	18/03/2024	18/03/2024	18/03/2024	18/03/2024	18/03/2024
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg					
Our Reference		346566-12	346566-17	346566-21	346566-22
Your Reference	UNITS	108	111	D1/LAH	D2/LAH
Depth		0-0.1	0-0.1	-	-
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	18/03/2024	18/03/2024	18/03/2024	18/03/2024
Date analysed	-	18/03/2024	18/03/2024	18/03/2024	18/03/2024
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5

Misc Inorg - Soil				
Our Reference		346566-2	346566-13	346566-16
Your Reference	UNITS	103	108	110
Depth		0.4	0.5	0.3
Type of sample		Soil	Soil	Soil
Date prepared	-	20/03/2024	20/03/2024	20/03/2024
Date analysed	-	20/03/2024	20/03/2024	20/03/2024
pH 1:5 soil:$CaCl_2$	pH Units	7.3	4.4	5.2

CEC				
Our Reference		346566-2	346566-13	346566-16
Your Reference	UNITS	103	108	110
Depth		0.4	0.5	0.3
Type of sample		Soil	Soil	Soil
Date prepared	-	22/03/2024	22/03/2024	22/03/2024
Date analysed	-	22/03/2024	22/03/2024	22/03/2024
Exchangeable Ca	meq/100g	26	4.4	19
Exchangeable K	meq/100g	0.2	0.5	1.3
Exchangeable Mg	meq/100g	2.8	4.1	4.3
Exchangeable Na	meq/100g	1.1	0.5	1.2
Cation Exchange Capacity	meq/100g	30	9.4	26

Moisture						
Our Reference		346566-1	346566-2	346566-3	346566-4	346566-5
Your Reference	UNITS	103	103	104	104	104
Depth		0-0.1	0.4	0-0.1	0.5	0.9
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	18/03/2024	18/03/2024	18/03/2024	18/03/2024	18/03/2024
Date analysed	-	19/03/2024	19/03/2024	19/03/2024	19/03/2024	19/03/2024
Moisture	%	31	28	11	19	18

Moisture						
Our Reference		346566-6	346566-7	346566-8	346566-9	346566-10
Your Reference	UNITS	105	105	106	106	107
Depth		0-0.1	0.5	0-0.2	0.45	0-0.1
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	18/03/2024	18/03/2024	18/03/2024	18/03/2024	18/03/2024
Date analysed	-	19/03/2024	19/03/2024	19/03/2024	19/03/2024	19/03/2024
Moisture	%	16	14	9.2	21	16

Moisture						
Our Reference		346566-11	346566-12	346566-13	346566-14	346566-15
Your Reference	UNITS	107	108	108	109	110
Depth		0.4	0-0.1	0.5	0-0.1	0-0.1
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	18/03/2024	18/03/2024	18/03/2024	18/03/2024	18/03/2024
Date analysed	-	19/03/2024	19/03/2024	19/03/2024	19/03/2024	19/03/2024
Moisture	%	9.4	35	26	24	25

Moisture						
Our Reference		346566-17	346566-18	346566-19	346566-20	346566-21
Your Reference	UNITS	111	111	111	112	D1/LAH
Depth		0-0.1	0.5	0.7	0-0.1	-
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	18/03/2024	18/03/2024	18/03/2024	18/03/2024	18/03/2024
Date analysed	-	19/03/2024	19/03/2024	19/03/2024	19/03/2024	19/03/2024
Moisture	%	6.1	28	30	12	17

Moisture		
Our Reference		346566-22
Your Reference	UNITS	D2/LAH
Depth		-
Type of sample		Soil
Date prepared	-	18/03/2024
Date analysed	-	19/03/2024
Moisture	%	14

PFAS in Soils Short					
Our Reference		346566-9	346566-12	346566-15	346566-20
Your Reference	UNITS	106	108	110	112
Depth		0.45	0-0.1	0-0.1	0-0.1
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	18/03/2024	18/03/2024	18/03/2024	18/03/2024
Date analysed	-	18/03/2024	18/03/2024	18/03/2024	18/03/2024
Perfluorohexanesulfonic acid - PFHxS	µg/kg	0.2	0.2	0.1	0.1
Perfluorooctanesulfonic acid PFOS	µg/kg	0.5	1.2	0.4	0.4
Perfluorooctanoic acid PFOA	µg/kg	0.3	0.1	<0.1	<0.1
6:2 FTS	µg/kg	<0.1	<0.1	<0.1	<0.1
8:2 FTS	µg/kg	<0.2	<0.2	<0.2	<0.2
Surrogate $^{13}C_8$ *PFOS*	%	98	98	97	96
Surrogate $^{13}C_2$ *PFOA*	%	98	100	97	99
Extracted ISTD $^{18}O_2$ *PFHxS*	%	92	91	90	90
Extracted ISTD $^{13}C_4$ *PFOS*	%	89	97	98	95
Extracted ISTD $^{13}C_4$ *PFOA*	%	96	101	99	95
Extracted ISTD $^{13}C_2$ *6:2FTS*	%	97	100	102	98
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	106	107	130	113
Total Positive PFHxS & PFOS	µg/kg	0.7	1.5	0.5	0.6
Total Positive PFOS & PFOA	µg/kg	0.9	1.3	0.4	0.4
Total Positive PFAS	µg/kg	1.0	1.6	0.5	0.6

Asbestos ID - soils NEPM						
Our Reference		346566-3	346566-6	346566-8	346566-10	346566-12
Your Reference	UNITS	104	105	106	107	108
Depth		0-0.1	0-0.1	0-0.2	0-0.1	0-0.1
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	20/03/2024	20/03/2024	20/03/2024	20/03/2024	20/03/2024
Sample mass tested	g	842.61	821.47	943.43	815.65	673.4
Sample Description	-	Grey coarse-grained soil & rocks	Grey coarse-grained soil & rocks	Grey coarse-grained soil & rocks	Grey coarse-grained soil & rocks	Grey coarse-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos[#1]	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–	–	–	–
FA and AF Estimation*	g	–	–	–	–	–
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM		
Our Reference		346566-17
Your Reference	UNITS	111
Depth		0-0.1
Type of sample		Soil
Date analysed	-	20/03/2024
Sample mass tested	g	605.29
Sample Description	-	Grey coarse-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected
Total Asbestos[#1]	g/kg	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected
ACM >7mm Estimation*	g	–
FA and AF Estimation*	g	–
FA and AF Estimation*#2	%(w/w)	<0.001

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
ASB-001	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 relative to the sample mass tested) 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.
Inorg-001	pH - Measured using pH meter and electrode. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Metals-020	Determination of various metals by ICP-AES.
Metals-020	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-OES analytical finish.
Metals-021	Determination of Mercury by Cold Vapour AAS.

Method ID	Methodology Summary
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.
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	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD and/or GC-MS/GC-MSMS. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ 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. 'EQ 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. 'EQ 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, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

Method ID	Methodology Summary
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly 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 is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.
Org-029	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLPs/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.4 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	346566-3
Date extracted	-			18/03/2024	1	18/03/2024	18/03/2024		18/03/2024	18/03/2024
Date analysed	-			21/03/2024	1	21/03/2024	21/03/2024		21/03/2024	21/03/2024
TRH C_6 - C_9	mg/kg	25	Org-023	<25	1	<25	<25	0	106	91
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	1	<25	<25	0	106	91
Benzene	mg/kg	0.2	Org-023	<0.2	1	<0.2	<0.2	0	101	85
Toluene	mg/kg	0.5	Org-023	<0.5	1	<0.5	<0.5	0	104	90
Ethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	109	95
m+p-xylene	mg/kg	2	Org-023	<2	1	<2	<2	0	108	93
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	115	97
Naphthalene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	87	1	79	79	0	90	85

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	346566-22
Date extracted	-			[NT]	10	18/03/2024	18/03/2024		18/03/2024	18/03/2024
Date analysed	-			[NT]	10	21/03/2024	21/03/2024		21/03/2024	21/03/2024
TRH C_6 - C_9	mg/kg	25	Org-023	[NT]	10	<25	<25	0	99	85
TRH C_6 - C_{10}	mg/kg	25	Org-023	[NT]	10	<25	<25	0	99	85
Benzene	mg/kg	0.2	Org-023	[NT]	10	<0.2	<0.2	0	93	80
Toluene	mg/kg	0.5	Org-023	[NT]	10	<0.5	<0.5	0	100	85
Ethylbenzene	mg/kg	1	Org-023	[NT]	10	<1	<1	0	101	88
m+p-xylene	mg/kg	2	Org-023	[NT]	10	<2	<2	0	100	86
o-Xylene	mg/kg	1	Org-023	[NT]	10	<1	<1	0	107	91
Naphthalene	mg/kg	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	10	87	83	5	85	83

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	21	18/03/2024	18/03/2024		[NT]	[NT]
Date analysed	-			[NT]	21	21/03/2024	21/03/2024		[NT]	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	[NT]	21	<25	<25	0	[NT]	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	[NT]	21	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	[NT]	21	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	[NT]	21	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	[NT]	21	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	[NT]	21	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-023	[NT]	21	<1	<1	0	[NT]	[NT]
Naphthalene	mg/kg	1	Org-023	[NT]	21	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	21	80	78	3	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	346566-3
Date extracted	-			18/03/2024	1	18/03/2024	18/03/2024		18/03/2024	18/03/2024
Date analysed	-			19/03/2024	1	18/03/2024	18/03/2024		18/03/2024	18/03/2024
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	1	<50	<50	0	102	128
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	1	140	140	0	97	108
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	1	160	160	0	100	76
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	1	<50	<50	0	102	128
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	1	240	250	4	97	108
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	1	<100	100	0	100	76
Surrogate o-Terphenyl	%		Org-020	86	1	90	92	2	89	84

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	346566-22
Date extracted	-			[NT]	10	18/03/2024	18/03/2024		18/03/2024	18/03/2024
Date analysed	-			[NT]	10	19/03/2024	19/03/2024		19/03/2024	18/03/2024
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	10	<50	<50	0	117	113
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	10	<100	<100	0	111	112
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	10	<100	<100	0	86	#
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	[NT]	10	<50	<50	0	117	113
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	[NT]	10	100	100	0	111	112
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	[NT]	10	<100	<100	0	86	#
Surrogate o-Terphenyl	%		Org-020	[NT]	10	89	84	6	90	92

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	21	18/03/2024	18/03/2024		[NT]	[NT]
Date analysed	-			[NT]	21	19/03/2024	19/03/2024		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	21	<50	<50	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	21	<100	<100	0	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	21	110	120	9	[NT]	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	[NT]	21	<50	<50	0	[NT]	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	[NT]	21	170	180	6	[NT]	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	[NT]	21	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-020	[NT]	21	87	87	0	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	346566-3
Date extracted	-			18/03/2024	1	18/03/2024	18/03/2024		18/03/2024	18/03/2024
Date analysed	-			19/03/2024	1	18/03/2024	18/03/2024		18/03/2024	18/03/2024
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	86	84
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	94	90
Fluorene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	88	88
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	94	103
Anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	1	0.2	0.2	0	96	106
Pyrene	mg/kg	0.1	Org-022/025	<0.1	1	0.2	0.1	67	92	113
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	76	79
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	1	0.09	0.08	12	92	90
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	111	1	110	106	4	93	95

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	346566-22
Date extracted	-			[NT]	10	18/03/2024	18/03/2024		18/03/2024	18/03/2024
Date analysed	-			[NT]	10	18/03/2024	18/03/2024		19/03/2024	19/03/2024
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	90	90
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	100	96
Fluorene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	94	94
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	100	96
Anthracene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	10	0.1	0.1	0	102	99
Pyrene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	96	100
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	82	80
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	10	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	10	<0.05	<0.05	0	100	102
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	10	99	93	6	94	93

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	21	18/03/2024	18/03/2024		[NT]	[NT]
Date analysed	-			[NT]	21	19/03/2024	19/03/2024		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	21	0.4	0.2	67	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	21	0.7	0.5	33	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-022/025	[NT]	21	0.7	0.4	55	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	21	0.2	0.2	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	21	0.2	0.2	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	21	0.5	0.4	22	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	21	0.3	0.3	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	21	0.2	0.1	67	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	21	0.2	0.2	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	21	94	105	11	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	346566-3
Date extracted	-			18/03/2024	1	18/03/2024	18/03/2024		18/03/2024	18/03/2024
Date analysed	-			19/03/2024	1	18/03/2024	18/03/2024		18/03/2024	18/03/2024
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	114	110
HCB	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	122	116
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	100	100
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	96	94
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	132	126
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	128	136
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	124	132
Endrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	118	134
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	116	122
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	110	118
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Mirex	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	103	1	103	99	4	90	87

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	346566-22
Date extracted	-			[NT]	10	18/03/2024	18/03/2024		18/03/2024	18/03/2024
Date analysed	-			[NT]	10	18/03/2024	18/03/2024		19/03/2024	19/03/2024
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	114	112
HCB	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	118	114
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	88	94
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	102	98
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	136	134
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	136	134
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	132	124
Endrin	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	108	124
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	116	116
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	98	114
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Mirex	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	[NT]	10	93	93	0	93	93

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	21	18/03/2024	18/03/2024		[NT]	[NT]
Date analysed	-			[NT]	21	19/03/2024	19/03/2024		[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
HCB	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Mirex	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	[NT]	21	94	97	3	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	346566-3
Date extracted	-			18/03/2024	1	18/03/2024	18/03/2024		18/03/2024	18/03/2024
Date analysed	-			19/03/2024	1	18/03/2024	18/03/2024		18/03/2024	18/03/2024
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	128	120
Mevinphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Phorate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Disulfoton	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Parathion-Methyl	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	90	88
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	96	102
Malathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	98	100
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	92	92
Fenthion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	98	104
Bromophos-ethyl	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Methidathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fenamiphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	98	112
Phosalone	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Coumaphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	103	1	103	99	4	90	87

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	346566-22
Date extracted	-			[NT]	10	18/03/2024	18/03/2024		18/03/2024	18/03/2024
Date analysed	-			[NT]	10	18/03/2024	18/03/2024		19/03/2024	19/03/2024
Dichlorvos	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	134	136
Mevinphos	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Phorate	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Disulfoton	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Parathion-Methyl	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	92	92
Fenitrothion	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	100	118
Malathion	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	100	116
Chlorpyriphos	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	94	94
Fenthion	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	104	116
Bromophos-ethyl	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Methidathion	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Fenamiphos	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	104	112
Phosalone	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Coumaphos	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	[NT]	10	93	93	0	93	93

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	21	18/03/2024	18/03/2024		[NT]	[NT]
Date analysed	-			[NT]	21	19/03/2024	19/03/2024		[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Mevinphos	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Phorate	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Disulfoton	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Parathion-Methyl	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Fenthion	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Methidathion	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Fenamiphos	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Phosalone	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Coumaphos	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	[NT]	21	94	97	3	[NT]	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	346566-3
Date extracted	-			18/03/2024	1	18/03/2024	18/03/2024		18/03/2024	18/03/2024
Date analysed	-			19/03/2024	1	18/03/2024	18/03/2024		18/03/2024	18/03/2024
Aroclor 1016	mg/kg	0.1	Org-021/022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021/022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021/022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021/022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021/022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021/022/025	<0.1	1	<0.1	<0.1	0	92	80
Aroclor 1260	mg/kg	0.1	Org-021/022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate 2-Fluorobiphenyl	%		Org-021/022/025	110	1	113	109	4	98	95

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	346566-22
Date extracted	-			[NT]	10	18/03/2024	18/03/2024		18/03/2024	18/03/2024
Date analysed	-			[NT]	10	18/03/2024	18/03/2024		19/03/2024	19/03/2024
Aroclor 1016	mg/kg	0.1	Org-021/022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021/022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021/022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021/022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021/022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021/022/025	[NT]	10	<0.1	<0.1	0	99	80
Aroclor 1260	mg/kg	0.1	Org-021/022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Surrogate 2-Fluorobiphenyl	%		Org-021/022/025	[NT]	10	102	103	1	102	102

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	21	18/03/2024	18/03/2024		[NT]	[NT]
Date analysed	-			[NT]	21	19/03/2024	19/03/2024		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-021/022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021/022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021/022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021/022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021/022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021/022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-021/022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Surrogate 2-Fluorobiphenyl	%		Org-021/022/025	[NT]	21	104	108	4	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	346566-3
Date prepared	-			15/03/2024	1	15/03/2024	15/03/2024		15/03/2024	15/03/2024
Date analysed	-			20/03/2024	1	20/03/2024	20/03/2024		20/03/2024	20/03/2024
Arsenic	mg/kg	4	Metals-020	<4	1	5	6	18	109	104
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	113	105
Chromium	mg/kg	1	Metals-020	<1	1	25	25	0	112	108
Copper	mg/kg	1	Metals-020	<1	1	18	17	6	109	112
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	0.2	67	98	128
Nickel	mg/kg	1	Metals-020	<1	1	19	19	0	109	106
Zinc	mg/kg	1	Metals-020	<1	1	130	120	8	107	93
Lead	mg/kg	1	Metals-020	<1	1	13	12	8	109	96
Iron	mg/kg	10	Metals-020	<10	1	25000	29000	15	119	#
Manganese	mg/kg	1	Metals-020	<1	1	93	97	4	119	118
Beryllium	mg/kg	1	Metals-020	<1	1	<1	<1	0	108	104
Boron	mg/kg	10	Metals-020	<10	1	<10	<10	0	108	##
Molybdenum	mg/kg	1	Metals-020	<1	1	<1	<1	0	106	87
Selenium	mg/kg	2	Metals-020	<2	1	<2	2	0	108	102

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	346566-22
Date prepared	-			[NT]	10	15/03/2024	15/03/2024		15/03/2024	15/03/2024
Date analysed	-			[NT]	10	20/03/2024	20/03/2024		20/03/2024	20/03/2024
Arsenic	mg/kg	4	Metals-020	[NT]	10	<4	<4	0	111	97
Cadmium	mg/kg	0.4	Metals-020	[NT]	10	<0.4	<0.4	0	116	102
Chromium	mg/kg	1	Metals-020	[NT]	10	18	20	11	114	98
Copper	mg/kg	1	Metals-020	[NT]	10	10	10	0	112	109
Mercury	mg/kg	0.1	Metals-021	[NT]	10	<0.1	<0.1	0	101	96
Nickel	mg/kg	1	Metals-020	[NT]	10	9	9	0	113	104
Zinc	mg/kg	1	Metals-020	[NT]	10	41	47	14	111	100
Lead	mg/kg	1	Metals-020	[NT]	10	9	9	0	113	99
Iron	mg/kg	10	Metals-020	[NT]	10	13000	21000	47	123	#
Manganese	mg/kg	1	Metals-020	[NT]	10	66	150	78	108	#
Beryllium	mg/kg	1	Metals-020	[NT]	10	<1	<1	0	112	103
Boron	mg/kg	10	Metals-020	[NT]	10	<10	<10	0	110	71
Molybdenum	mg/kg	1	Metals-020	[NT]	10	<1	<1	0	110	[NT]
Selenium	mg/kg	2	Metals-020	[NT]	10	<2	<2	0	109	94

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	21	15/03/2024	15/03/2024		[NT]	[NT]
Date analysed	-			[NT]	21	20/03/2024	20/03/2024		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	21	<4	8	67	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	21	<0.4	2	133	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	21	17	22	26	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	21	15	31	70	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	21	<0.1	0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	21	9	16	56	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	21	95	510	137	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	21	38	61	46	[NT]	[NT]
Iron	mg/kg	10	Metals-020	[NT]	21	13000	29000	76	[NT]	[NT]
Manganese	mg/kg	1	Metals-020	[NT]	21	200	310	43	[NT]	[NT]
Beryllium	mg/kg	1	Metals-020	[NT]	21	<1	<1	0	[NT]	[NT]
Boron	mg/kg	10	Metals-020	[NT]	21	<10	<10	0	[NT]	[NT]
Molybdenum	mg/kg	1	Metals-020	[NT]	21	<1	<1	0	[NT]	[NT]
Selenium	mg/kg	2	Metals-020	[NT]	21	<2	<2	0	[NT]	[NT]

QUALITY CONTROL: Misc Soil - Inorg						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	346566-3
Date prepared	-			18/03/2024	1	18/03/2024	18/03/2024		18/03/2024	18/03/2024
Date analysed	-			18/03/2024	1	18/03/2024	18/03/2024		18/03/2024	18/03/2024
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	1	<5	<5	0	101	97

QUALITY CONTROL: Misc Inorg - Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	[NT]
Date prepared	-			20/03/2024	[NT]	[NT]	[NT]	[NT]	20/03/2024	[NT]
Date analysed	-			20/03/2024	[NT]	[NT]	[NT]	[NT]	20/03/2024	[NT]
pH 1:5 soil:$CaCl_2$	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	101	[NT]

QUALITY CONTROL: CEC						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			22/03/2024	16	22/03/2024	22/03/2024		22/03/2024	[NT]
Date analysed	-			22/03/2024	16	22/03/2024	22/03/2024		22/03/2024	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	16	19	19	0	113	[NT]
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	16	1.3	1.3	0	112	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	16	4.3	4.4	2	110	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	16	1.2	1.2	0	84	[NT]

QUALITY CONTROL: PFAS in Soils Short						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	[NT]
Date prepared	-			18/03/2024	15	18/03/2024	18/03/2024		18/03/2024	[NT]
Date analysed	-			18/03/2024	15	18/03/2024	18/03/2024		18/03/2024	[NT]
Perfluorohexanesulfonic acid - PFHxS	µg/kg	0.1	Org-029	<0.1	15	0.1	0.1	0	100	[NT]
Perfluorooctanesulfonic acid PFOS	µg/kg	0.1	Org-029	<0.1	15	0.4	0.4	0	91	[NT]
Perfluorooctanoic acid PFOA	µg/kg	0.1	Org-029	<0.1	15	<0.1	<0.1	0	100	[NT]
6:2 FTS	µg/kg	0.1	Org-029	<0.1	15	<0.1	<0.1	0	98	[NT]
8:2 FTS	µg/kg	0.2	Org-029	<0.2	15	<0.2	<0.2	0	99	[NT]
Surrogate $^{13}C_8$ *PFOS*	%		Org-029	95	15	97	101	4	95	[NT]
Surrogate $^{13}C_2$ *PFOA*	%		Org-029	97	15	97	99	2	100	[NT]
Extracted ISTD $^{18}O_2$ *PFHxS*	%		Org-029	103	15	90	92	2	104	[NT]
Extracted ISTD $^{13}C_4$ *PFOS*	%		Org-029	104	15	98	93	5	106	[NT]
Extracted ISTD $^{13}C_4$ *PFOA*	%		Org-029	111	15	99	100	1	107	[NT]
Extracted ISTD $^{13}C_2$ *6:2FTS*	%		Org-029	123	15	102	106	4	118	[NT]
Extracted ISTD $^{13}C_2$ *8:2FTS*	%		Org-029	127	15	130	123	6	123	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

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

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

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

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

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

TRH Soil C10-C40 NEPM - # Percent recovery for the surrogate is not possible to report as the high concentration of analytes in sample 346566-22ms have caused interference.

Asbestos-ID in soil: NEPM
This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013. This is reported outside our scope of NATA accreditation.

Acid Extractable Metals in Soil:
- The laboratory RPD acceptance criteria has been exceeded for 346566-10 for Mn and Fe. Therefore a triplicate result has been issued as laboratory sample number 346566-23.
- The laboratory RPD acceptance criteria has been exceeded for 346566-21 for Cu, Ni, Pb, Zn, Mn and Fe. Therefore a triplicate result has been issued as laboratory sample number 346566-24.
- # Percent recovery is not applicable due to the high concentration of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.
- ## High spike recovery was obtained for this sample. Sample matrix interference is suspected. However, an acceptable recovery was obtained for the LCS
- The PQL for 346566-3 has been raised for B due to the high spike recovery. This may reflect other samples where similar in matrix and similar analytical interferences occur.

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CERTIFICATE OF ANALYSIS 346566-A

Client Details

Client	Douglas Partners Newcastle
Attention	Jason Lambert
Address	Box 324 Hunter Region Mail Centre, Newcastle, NSW, 2310

Sample Details

Your Reference	**226269.01, Williamtown**
Number of Samples	Additional analysis
Date samples received	15/03/2024
Date completed instructions received	03/04/2024

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	10/04/2024
Date of Issue	09/04/2024

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

Results Approved By
Dragana Tomas, Senior Chemist
Sean McAlary, Chemist (FAS)

Authorised By
Nancy Zhang, Laboratory Manager

TCLP Preparation - Acid						
Our Reference		346566-A-7	346566-A-8	346566-A-9	346566-A-12	346566-A-15
Your Reference	UNITS	105	106	106	108	110
Depth		0.5	0-0.2	0.45	0-0.1	0-0.1
Type of sample		Soil	Soil	Soil	Soil	Soil
pH of soil for fluid# determ.	pH units	6.9	6.9	6.9	7.1	6.8
pH of soil TCLP (after HCl)	pH units	1.8	1.7	1.8	1.8	1.8
Extraction fluid used		1	1	1	1	1
pH of final Leachate	pH units	5.1	5.2	5.0	4.9	4.9

TCLP Preparation - Acid		
Our Reference		346566-A-20
Your Reference	UNITS	112
Depth		0-0.1
Type of sample		Soil
pH of soil for fluid# determ.	pH units	7.0
pH of soil TCLP (after HCl)	pH units	1.8
Extraction fluid used		1
pH of final Leachate	pH units	4.9

PAHs in TCLP (USEPA 1311)			
Our Reference		346566-A-7	346566-A-8
Your Reference	UNITS	105	106
Depth		0.5	0-0.2
Type of sample		Soil	Soil
Date extracted	-	08/04/2024	08/04/2024
Date analysed	-	09/04/2024	09/04/2024
Naphthalene in TCLP	mg/L	0.0002	<0.0001
Acenaphthylene in TCLP	mg/L	<0.0001	<0.0001
Acenaphthene in TCLP	mg/L	<0.0001	<0.0001
Fluorene in TCLP	mg/L	<0.0001	<0.0001
Phenanthrene in TCLP	mg/L	<0.0001	<0.0001
Anthracene in TCLP	mg/L	<0.0001	<0.0001
Fluoranthene in TCLP	mg/L	<0.0001	<0.0001
Pyrene in TCLP	mg/L	<0.0001	<0.0001
Benzo(a)anthracene in TCLP	mg/L	<0.0001	<0.0001
Chrysene in TCLP	mg/L	<0.0001	<0.0001
Benzo(bjk)fluoranthene in TCLP	mg/L	<0.0002	<0.0002
Benzo(a)pyrene in TCLP	mg/L	0.0002	<0.0001
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	<0.0001	<0.0001
Dibenzo(a,h)anthracene in TCLP	mg/L	<0.0001	<0.0001
Benzo(g,h,i)perylene in TCLP	mg/L	<0.0001	<0.0001
Total +ve PAH's	mg/L	0.0004	NIL (+)VE
Surrogate p-Terphenyl-d14	%	93	94

PFAS in TCLP Short					
Our Reference		346566-A-9	346566-A-12	346566-A-15	346566-A-20
Your Reference	UNITS	106	108	110	112
Depth		0.45	0-0.1	0-0.1	0-0.1
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	08/04/2024	08/04/2024	08/04/2024	08/04/2024
Date analysed	-	08/04/2024	08/04/2024	08/04/2024	08/04/2024
Perfluorohexanesulfonic acid - PFHxS	µg/L	<0.01	<0.01	<0.01	<0.01
Perfluorooctanesulfonic acid PFOS	µg/L	<0.01	<0.01	<0.01	<0.01
Perfluorooctanoic acid PFOA	µg/L	<0.01	<0.01	<0.01	<0.01
6:2 FTS	µg/L	<0.01	<0.01	<0.01	<0.01
8:2 FTS	µg/L	<0.02	<0.02	<0.02	<0.02
Surrogate $^{13}C_8$ *PFOS*	%	95	92	100	96
Surrogate $^{13}C_2$ *PFOA*	%	101	93	98	98
Extracted ISTD $^{18}O_2$ *PFHxS*	%	94	95	92	94
Extracted ISTD $^{13}C_4$ *PFOS*	%	101	105	97	102
Extracted ISTD $^{13}C_4$ *PFOA*	%	98	102	100	99
Extracted ISTD $^{13}C_2$ *6:2FTS*	%	106	101	104	98
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	119	112	106	112
Total Positive PFHxS & PFOS	µg/L	<0.01	<0.01	<0.01	<0.01
Total Positive PFOS & PFOA	µg/L	<0.01	<0.01	<0.01	<0.01
Total Positive PFAS	µg/L	<0.01	<0.01	<0.01	<0.01

Method ID	Methodology Summary
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using AS 4439. Please note that the mass used may be scaled down from default based on sample mass available. Samples are stored at 2-6oC before and after leachate preparation.
Org-022/025	Leachates are extracted with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-029	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLPs/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.4 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

QUALITY CONTROL: PAHs in TCLP (USEPA 1311)					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			08/04/2024	[NT]	[NT]	[NT]	[NT]	08/04/2024	[NT]
Date analysed	-			09/04/2024	[NT]	[NT]	[NT]	[NT]	09/04/2024	[NT]
Naphthalene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	[NT]	[NT]	[NT]	[NT]	91	[NT]
Acenaphthylene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	[NT]	[NT]	[NT]	[NT]	91	[NT]
Fluorene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	[NT]	[NT]	[NT]	[NT]	90	[NT]
Phenanthrene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	[NT]	[NT]	[NT]	[NT]	101	[NT]
Anthracene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	[NT]	[NT]	[NT]	[NT]	100	[NT]
Pyrene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	[NT]	[NT]	[NT]	[NT]	100	[NT]
Benzo(a)anthracene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	[NT]	[NT]	[NT]	[NT]	76	[NT]
Benzo(bjk)fluoranthene in TCLP	mg/L	0.0002	Org-022/025	<0.0002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	[NT]	[NT]	[NT]	[NT]	96	[NT]
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	0.0001	Org-022/025	<0.0001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	100	[NT]	[NT]	[NT]	[NT]	106	[NT]

QUALITY CONTROL: PFAS in TCLP Short						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	346566-A-12
Date prepared	-			08/04/2024	9	08/04/2024	08/04/2024		08/04/2024	08/04/2024
Date analysed	-			08/04/2024	9	08/04/2024	08/04/2024		08/04/2024	08/04/2024
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.01	Org-029	<0.01	9	<0.01	<0.01	0	108	108
Perfluorooctanesulfonic acid PFOS	µg/L	0.01	Org-029	<0.01	9	<0.01	<0.01	0	107	113
Perfluorooctanoic acid PFOA	µg/L	0.01	Org-029	<0.01	9	<0.01	<0.01	0	102	105
6:2 FTS	µg/L	0.01	Org-029	<0.01	9	<0.01	<0.01	0	100	100
8:2 FTS	µg/L	0.02	Org-029	<0.02	9	<0.02	<0.02	0	107	108
Surrogate $^{13}C_8$ *PFOS*	%		Org-029	104	9	95	98	3	101	104
Surrogate $^{13}C_2$ *PFOA*	%		Org-029	98	9	101	98	3	96	98
Extracted ISTD $^{18}O_2$ *PFHxS*	%		Org-029	94	9	94	93	1	92	91
Extracted ISTD $^{13}C_4$ *PFOS*	%		Org-029	91	9	101	99	2	95	91
Extracted ISTD $^{13}C_4$ *PFOA*	%		Org-029	98	9	98	101	3	97	96
Extracted ISTD $^{13}C_2$ *6:2FTS*	%		Org-029	102	9	106	100	6	95	94
Extracted ISTD $^{13}C_2$ *8:2FTS*	%		Org-029	106	9	119	111	7	109	110

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

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

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

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

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

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

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CERTIFICATE OF ANALYSIS 348566

Client Details

Client	Douglas Partners Newcastle
Attention	Jason Lambert
Address	Box 324 Hunter Region Mail Centre, Newcastle, NSW, 2310

Sample Details

Your Reference	**226269.01, Williamtown**
Number of Samples	15 Soil
Date samples received	11/04/2024
Date completed instructions received	11/04/2024

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	18/04/2024
Date of Issue	18/04/2024

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Analysed by Asbestos Approved Analyst: Lucy Zhu
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Results Approved By
Diego Bigolin, Inorganics Supervisor
Dragana Tomas, Senior Chemist
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Lucy Zhu, Asbestos Supervisor
Sean McAlary, Chemist (FAS)
Timothy Toll, Senior Chemist

Authorised By
Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		348566-2	348566-3	348566-4	348566-6	348566-7
Your Reference	UNITS	114	115	116	117	117
Depth		0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.3
Date Sampled		09/04/2024	09/04/2024	09/04/2024	09/04/2024	09/04/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/04/2024	12/04/2024	12/04/2024	12/04/2024	12/04/2024
Date analysed	-	15/04/2024	15/04/2024	15/04/2024	15/04/2024	15/04/2024
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	106	106	106	104	102

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		348566-8	348566-9	348566-10	348566-11	348566-13
Your Reference	UNITS	118	118	118	119	D3/MJD
Depth		0.0-0.1	0.3	0.5	0.0-0.1	-
Date Sampled		09/04/2024	09/04/2024	09/04/2024	09/04/2024	09/04/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/04/2024	12/04/2024	12/04/2024	12/04/2024	12/04/2024
Date analysed	-	15/04/2024	15/04/2024	15/04/2024	15/04/2024	15/04/2024
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	103	106	102	99	70

vTRH(C6-C10)/BTEXN in Soil			
Our Reference		348566-14	348566-15
Your Reference	UNITS	TS/2024.04.09	TB/2024.04.09
Depth		-	-
Date Sampled		09/04/2024	09/04/2024
Type of sample		Soil	Soil
Date extracted	-	12/04/2024	12/04/2024
Date analysed	-	15/04/2024	15/04/2024
TRH C_6 - C_9	mg/kg	[NA]	<25
TRH C_6 - C_{10}	mg/kg	[NA]	<25
vTRH C_6 - C_{10} less BTEX (F1)	mg/kg	[NA]	<25
Benzene	mg/kg	103%	<0.2
Toluene	mg/kg	103%	<0.5
Ethylbenzene	mg/kg	102%	<1
m+p-xylene	mg/kg	102%	<2
o-Xylene	mg/kg	102%	<1
Naphthalene	mg/kg	[NA]	<1
Total +ve Xylenes	mg/kg	[NA]	<1
Surrogate aaa-Trifluorotoluene	%	100	101

svTRH (C10-C40) in Soil						
Our Reference		348566-2	348566-3	348566-4	348566-6	348566-7
Your Reference	UNITS	114	115	116	117	117
Depth		0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.3
Date Sampled		09/04/2024	09/04/2024	09/04/2024	09/04/2024	09/04/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/04/2024	12/04/2024	12/04/2024	12/04/2024	12/04/2024
Date analysed	-	14/04/2024	14/04/2024	14/04/2024	14/04/2024	14/04/2024
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	180	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	160	130	100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	340	130	100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} -C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	280	170	140
TRH >C_{34} -C_{40}	mg/kg	<100	<100	130	140	120
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	410	310	260
Surrogate o-Terphenyl	%	89	87	94	84	88

svTRH (C10-C40) in Soil						
Our Reference		348566-8	348566-9	348566-10	348566-11	348566-13
Your Reference	UNITS	118	118	118	119	D3/MJD
Depth		0.0-0.1	0.3	0.5	0.0-0.1	-
Date Sampled		09/04/2024	09/04/2024	09/04/2024	09/04/2024	09/04/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/04/2024	12/04/2024	12/04/2024	12/04/2024	12/04/2024
Date analysed	-	14/04/2024	14/04/2024	14/04/2024	14/04/2024	14/04/2024
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	59	<50
TRH C_{15} - C_{28}	mg/kg	130	<100	120	340	120
TRH C_{29} - C_{36}	mg/kg	250	<100	180	280	240
Total +ve TRH (C10-C36)	mg/kg	380	<50	300	680	360
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	79	<50
TRH >C_{10} -C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	79	<50
TRH >C_{16} -C_{34}	mg/kg	280	<100	220	510	260
TRH >C_{34} -C_{40}	mg/kg	320	<100	210	220	320
Total +ve TRH (>C10-C40)	mg/kg	600	<50	430	810	580
Surrogate o-Terphenyl	%	84	84	84	96	82

PAHs in Soil						
Our Reference		348566-2	348566-3	348566-4	348566-6	348566-7
Your Reference	UNITS	114	115	116	117	117
Depth		0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.3
Date Sampled		09/04/2024	09/04/2024	09/04/2024	09/04/2024	09/04/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/04/2024	12/04/2024	12/04/2024	12/04/2024	12/04/2024
Date analysed	-	12/04/2024	12/04/2024	12/04/2024	12/04/2024	12/04/2024
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	0.5	0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	0.3	2.1	0.5
Anthracene	mg/kg	<0.1	<0.1	<0.1	0.6	0.1
Fluoranthene	mg/kg	0.1	0.2	0.5	4.9	1.1
Pyrene	mg/kg	0.1	0.2	0.5	4.6	1.1
Benzo(a)anthracene	mg/kg	<0.1	0.1	0.3	2.0	0.4
Chrysene	mg/kg	<0.1	0.1	0.3	1.7	0.4
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	0.2	0.6	3.7	0.8
Benzo(a)pyrene	mg/kg	0.09	0.1	0.3	2.5	0.56
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	0.2	1.6	0.4
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	0.3	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	0.1	0.2	2.2	0.5
Total +ve PAH's	mg/kg	0.3	1.0	3.2	27	6.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	3.6	0.7
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	3.6	0.8
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	0.5	3.6	0.8
Surrogate p-Terphenyl-d14	%	97	99	94	93	93

PAHs in Soil						
Our Reference		348566-8	348566-9	348566-10	348566-11	348566-13
Your Reference	UNITS	118	118	118	119	D3/MJD
Depth		0.0-0.1	0.3	0.5	0.0-0.1	-
Date Sampled		09/04/2024	09/04/2024	09/04/2024	09/04/2024	09/04/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/04/2024	12/04/2024	12/04/2024	12/04/2024	12/04/2024
Date analysed	-	12/04/2024	12/04/2024	12/04/2024	12/04/2024	12/04/2024
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.5	<0.1	0.1	<0.1	0.4
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	1.8	<0.1	0.6	0.8	1.6
Anthracene	mg/kg	0.6	<0.1	0.1	<0.1	0.4
Fluoranthene	mg/kg	4.4	<0.1	1.1	0.8	3.5
Pyrene	mg/kg	4.2	<0.1	1	0.7	3.4
Benzo(a)anthracene	mg/kg	1.8	<0.1	0.4	0.4	1.4
Chrysene	mg/kg	1.5	<0.1	0.4	0.4	1.2
Benzo(b,j+k)fluoranthene	mg/kg	3.6	<0.2	0.7	0.6	2.8
Benzo(a)pyrene	mg/kg	2.3	<0.05	0.5	0.2	1.8
Indeno(1,2,3-c,d)pyrene	mg/kg	1.5	<0.1	0.3	0.1	1.2
Dibenzo(a,h)anthracene	mg/kg	0.3	<0.1	<0.1	<0.1	0.2
Benzo(g,h,i)perylene	mg/kg	2.3	<0.1	0.4	0.1	1.8
Total +ve PAH's	mg/kg	25	<0.05	5.6	4.3	20
Benzo(a)pyrene TEQ calc (zero)	mg/kg	3.4	<0.5	0.6	<0.5	2.6
Benzo(a)pyrene TEQ calc(half)	mg/kg	3.4	<0.5	0.7	<0.5	2.6
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	3.4	<0.5	0.7	<0.5	2.6
Surrogate p-Terphenyl-d14	%	95	101	92	92	94

Organochlorine Pesticides in soil					
Our Reference		348566-4	348566-8	348566-11	348566-13
Your Reference	UNITS	116	118	119	D3/MJD
Depth		0.0-0.1	0.0-0.1	0.0-0.1	-
Date Sampled		09/04/2024	09/04/2024	09/04/2024	09/04/2024
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	12/04/2024	12/04/2024	12/04/2024	12/04/2024
Date analysed	-	12/04/2024	12/04/2024	12/04/2024	12/04/2024
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate 4-Chloro-3-NBTF	%	90	92	85	90

Organophosphorus Pesticides in Soil					
Our Reference		348566-4	348566-8	348566-11	348566-13
Your Reference	UNITS	116	118	119	D3/MJD
Depth		0.0-0.1	0.0-0.1	0.0-0.1	-
Date Sampled		09/04/2024	09/04/2024	09/04/2024	09/04/2024
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	12/04/2024	12/04/2024	12/04/2024	12/04/2024
Date analysed	-	12/04/2024	12/04/2024	12/04/2024	12/04/2024
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1
Mevinphos	mg/kg	<0.1	<0.1	<0.1	<0.1
Phorate	mg/kg	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1
Disulfoton	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Parathion-Methyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1
Fenthion	mg/kg	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Methidathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Fenamiphos	mg/kg	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1
Phosalone	mg/kg	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1
Coumaphos	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate 4-Chloro-3-NBTF	%	90	92	85	90

PCBs in Soil					
Our Reference		348566-4	348566-8	348566-11	348566-13
Your Reference	UNITS	116	118	119	D3/MJD
Depth		0.0-0.1	0.0-0.1	0.0-0.1	-
Date Sampled		09/04/2024	09/04/2024	09/04/2024	09/04/2024
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	12/04/2024	12/04/2024	12/04/2024	12/04/2024
Date analysed	-	12/04/2024	12/04/2024	12/04/2024	12/04/2024
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate 2-Fluorobiphenyl	%	93	91	88	90

Misc Soil - Inorg					
Our Reference		348566-4	348566-8	348566-11	348566-13
Your Reference	UNITS	116	118	119	D3/MJD
Depth		0.0-0.1	0.0-0.1	0.0-0.1	-
Date Sampled		09/04/2024	09/04/2024	09/04/2024	09/04/2024
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	16/04/2024	16/04/2024	16/04/2024	16/04/2024
Date analysed	-	16/04/2024	16/04/2024	16/04/2024	16/04/2024
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5

Acid Extractable metals in soil						
Our Reference		348566-2	348566-3	348566-4	348566-6	348566-7
Your Reference	UNITS	114	115	116	117	117
Depth		0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.3
Date Sampled		09/04/2024	09/04/2024	09/04/2024	09/04/2024	09/04/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	12/04/2024	12/04/2024	12/04/2024	12/04/2024	12/04/2024
Date analysed	-	16/04/2024	16/04/2024	16/04/2024	16/04/2024	16/04/2024
Arsenic	mg/kg	26	7	5	<4	5
Cadmium	mg/kg	<0.4	<0.4	0.6	<0.4	<0.4
Chromium	mg/kg	51	18	16	9	10
Copper	mg/kg	35	40	45	13	12
Lead	mg/kg	31	43	76	16	16
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	16	15	10	6	7
Zinc	mg/kg	63	97	270	64	60
Iron	mg/kg	21,000	19,000	15,000	11,000	12,000
Manganese	mg/kg	310	360	300	430	330
Beryllium	mg/kg	<1	<1	<1	<1	<1
Boron	mg/kg	<10	<10	<10	<10	<10
Molybdenum	mg/kg	<1	<1	<1	<1	<1
Selenium	mg/kg	<2	<2	<2	<2	<2

Acid Extractable metals in soil						
Our Reference		348566-8	348566-9	348566-10	348566-11	348566-13
Your Reference	UNITS	118	118	118	119	D3/MJD
Depth		0.0-0.1	0.3	0.5	0.0-0.1	-
Date Sampled		09/04/2024	09/04/2024	09/04/2024	09/04/2024	09/04/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	12/04/2024	12/04/2024	12/04/2024	12/04/2024	12/04/2024
Date analysed	-	16/04/2024	16/04/2024	16/04/2024	16/04/2024	16/04/2024
Arsenic	mg/kg	8	14	6	11	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	41	17	17	18	10
Copper	mg/kg	19	7	12	68	16
Lead	mg/kg	28	7	11	270	21
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	9	7	12	13	6
Zinc	mg/kg	80	36	32	280	61
Iron	mg/kg	19,000	18,000	17,000	22,000	12,000
Manganese	mg/kg	1,500	36	71	840	490
Beryllium	mg/kg	1	<1	<1	<1	<1
Boron	mg/kg	<20	<10	<10	<10	<10
Molybdenum	mg/kg	<1	<1	<1	1	<1
Selenium	mg/kg	<2	<2	<2	<2	<2

Acid Extractable metals in soil			
Our Reference		348566-16	348566-17
Your Reference	UNITS	116 - [TRIPLICATE]	119 - [TRIPLICATE]
Depth		0.0-0.1	0.0-0.1
Date Sampled		09/04/2024	09/04/2024
Type of sample		Soil	Soil
Date prepared	-	12/04/2024	12/04/2024
Date analysed	-	16/04/2024	16/04/2024
Arsenic	mg/kg	6	8
Cadmium	mg/kg	0.5	0.4
Chromium	mg/kg	19	20
Copper	mg/kg	47	67
Lead	mg/kg	79	140
Mercury	mg/kg	<0.1	<0.1
Nickel	mg/kg	11	15
Zinc	mg/kg	250	270
Iron	mg/kg	21,000	23,000
Manganese	mg/kg	400	640
Beryllium	mg/kg	<1	1
Boron	mg/kg	<10	<10
Molybdenum	mg/kg	<1	1
Selenium	mg/kg	<2	<2

Moisture						
Our Reference		348566-1	348566-2	348566-3	348566-4	348566-5
Your Reference	UNITS	113	114	115	116	116
Depth		0.5	0.0-0.1	0.0-0.1	0.0-0.1	0.9
Date Sampled		09/04/2024	09/04/2024	09/04/2024	09/04/2024	09/04/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	12/04/2024	12/04/2024	12/04/2024	12/04/2024	12/04/2024
Date analysed	-	15/04/2024	15/04/2024	15/04/2024	15/04/2024	15/04/2024
Moisture	%	26	13	7.5	12	26

Moisture						
Our Reference		348566-6	348566-7	348566-8	348566-9	348566-10
Your Reference	UNITS	117	117	118	118	118
Depth		0.0-0.1	0.3	0.0-0.1	0.3	0.5
Date Sampled		09/04/2024	09/04/2024	09/04/2024	09/04/2024	09/04/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	12/04/2024	12/04/2024	12/04/2024	12/04/2024	12/04/2024
Date analysed	-	15/04/2024	15/04/2024	15/04/2024	15/04/2024	15/04/2024
Moisture	%	8.7	11	6.4	9.7	21

Moisture				
Our Reference		348566-11	348566-12	348566-13
Your Reference	UNITS	119	119	D3/MJD
Depth		0.0-0.1	0.5	-
Date Sampled		09/04/2024	09/04/2024	09/04/2024
Type of sample		Soil	Soil	Soil
Date prepared	-	12/04/2024	12/04/2024	12/04/2024
Date analysed	-	15/04/2024	15/04/2024	15/04/2024
Moisture	%	11	27	6.4

Asbestos ID - soils NEPM						
Our Reference		348566-2	348566-3	348566-4	348566-6	348566-7
Your Reference	UNITS	114	115	116	117	117
Depth		0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.3
Date Sampled		09/04/2024	09/04/2024	09/04/2024	09/04/2024	09/04/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	17/04/2024	17/04/2024	17/04/2024	17/04/2024	17/04/2024
Sample mass tested	g	1,117.73	1,024.76	932.85	1,060.79	1,053.01
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected Synthetic mineral fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos[#1]	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–	–	–	–
FA and AF Estimation*	g	–	–	–	–	–
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM			
Our Reference		348566-8	348566-11
Your Reference	UNITS	118	119
Depth		0.0-0.1	0.0-0.1
Date Sampled		09/04/2024	09/04/2024
Type of sample		Soil	Soil
Date analysed	-	17/04/2024	17/04/2024
Sample mass tested	g	1,279.32	1,050.3
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected
Total Asbestos#1	g/kg	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–
FA and AF Estimation*	g	–	–
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001

PFAS in Soils Short				
Our Reference		348566-1	348566-5	348566-12
Your Reference	UNITS	113	116	119
Depth		0.5	0.9	0.5
Date Sampled		09/04/2024	09/04/2024	09/04/2024
Type of sample		Soil	Soil	Soil
Date prepared	-	12/04/2024	12/04/2024	12/04/2024
Date analysed	-	12/04/2024	12/04/2024	12/04/2024
Perfluorohexanesulfonic acid - PFHxS	µg/kg	<0.1	<0.1	<0.1
Perfluorooctanesulfonic acid PFOS	µg/kg	<0.1	<0.1	0.1
Perfluorooctanoic acid PFOA	µg/kg	<0.1	<0.1	<0.1
6:2 FTS	µg/kg	<0.1	<0.1	<0.1
8:2 FTS	µg/kg	<0.2	<0.2	<0.2
Surrogate $^{13}C_8$ *PFOS*	%	107	109	116
Surrogate $^{13}C_2$ *PFOA*	%	94	95	97
Extracted ISTD $^{18}O_2$ *PFHxS*	%	96	99	98
Extracted ISTD $^{13}C_4$ *PFOS*	%	88	82	79
Extracted ISTD $^{13}C_4$ *PFOA*	%	101	103	98
Extracted ISTD $^{13}C_2$ *6:2FTS*	%	111	119	109
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	103	99	57
Total Positive PFHxS & PFOS	µg/kg	<0.1	<0.1	0.1
Total Positive PFOS & PFOA	µg/kg	<0.1	<0.1	0.1
Total Positive PFAS	µg/kg	<0.1	<0.1	0.1

CEC		
Our Reference		348566-1
Your Reference	UNITS	113
Depth		0.5
Date Sampled		09/04/2024
Type of sample		Soil
Date prepared	-	15/04/2024
Date analysed	-	15/04/2024
Exchangeable Ca	meq/100g	19
Exchangeable K	meq/100g	<0.1
Exchangeable Mg	meq/100g	2.3
Exchangeable Na	meq/100g	0.7
Cation Exchange Capacity	meq/100g	22

Misc Inorg - Soil		
Our Reference		348566-1
Your Reference	UNITS	113
Depth		0.5
Date Sampled		09/04/2024
Type of sample		Soil
Date prepared	-	15/04/2024
Date analysed	-	15/04/2024
pH 1:5 soil:$CaCl_2$	pH Units	7.0

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
ASB-001	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 relative to the sample mass tested) 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.
Inorg-001	pH - Measured using pH meter and electrode. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Metals-020	Determination of various metals by ICP-AES.
Metals-020	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-OES analytical finish.
Metals-021	Determination of Mercury by Cold Vapour AAS.

Method ID	Methodology Summary
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.
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	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD and/or GC-MS/GC-MSMS. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ 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. 'EQ 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. 'EQ 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, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

Method ID	Methodology Summary
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly 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 is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.
Org-029	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLPs/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.4 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	348566-8
Date extracted	-			12/04/2024	4	12/04/2024	12/04/2024		12/04/2024	12/04/2024
Date analysed	-			15/04/2024	4	15/04/2024	15/04/2024		15/04/2024	15/04/2024
TRH C_6 - C_9	mg/kg	25	Org-023	<25	4	<25	<25	0	110	115
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	4	<25	<25	0	110	115
Benzene	mg/kg	0.2	Org-023	<0.2	4	<0.2	<0.2	0	105	115
Toluene	mg/kg	0.5	Org-023	<0.5	4	<0.5	<0.5	0	108	120
Ethylbenzene	mg/kg	1	Org-023	<1	4	<1	<1	0	113	111
m+p-xylene	mg/kg	2	Org-023	<2	4	<2	<2	0	111	115
o-Xylene	mg/kg	1	Org-023	<1	4	<1	<1	0	115	115
Naphthalene	mg/kg	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	112	4	106	106	0	99	104

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	11	12/04/2024	12/04/2024		[NT]	[NT]
Date analysed	-			[NT]	11	15/04/2024	15/04/2024		[NT]	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	[NT]	11	<25	<25	0	[NT]	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	[NT]	11	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	[NT]	11	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	[NT]	11	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	[NT]	11	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	[NT]	11	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-023	[NT]	11	<1	<1	0	[NT]	[NT]
Naphthalene	mg/kg	1	Org-023	[NT]	11	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	11	99	98	1	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	348566-8
Date extracted	-			12/04/2024	4	12/04/2024	12/04/2024		12/04/2024	12/04/2024
Date analysed	-			14/04/2024	4	14/04/2024	14/04/2024		14/04/2024	14/04/2024
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	4	<50	<50	0	109	104
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	4	180	230	24	100	112
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	4	160	240	40	100	#
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	4	<50	52	4	109	104
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	4	280	370	28	100	112
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	4	130	190	38	100	#
Surrogate o-Terphenyl	%		Org-020	82	4	94	92	2	86	85

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	11	12/04/2024	12/04/2024		[NT]	[NT]
Date analysed	-			[NT]	11	14/04/2024	14/04/2024		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	11	59	59	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	11	340	330	3	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	11	280	280	0	[NT]	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	[NT]	11	79	77	3	[NT]	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	[NT]	11	510	500	2	[NT]	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	[NT]	11	220	220	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-020	[NT]	11	96	96	0	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	348566-8
Date extracted	-			12/04/2024	4	12/04/2024	12/04/2024		12/04/2024	12/04/2024
Date analysed	-			12/04/2024	4	12/04/2024	12/04/2024		12/04/2024	12/04/2024
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	92	84
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	94	86
Fluorene	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	92	88
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	4	0.3	0.4	29	94	#
Anthracene	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	4	0.5	0.5	0	100	#
Pyrene	mg/kg	0.1	Org-022/025	<0.1	4	0.5	0.5	0	96	#
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	4	0.3	0.4	29	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	4	0.3	0.3	0	88	#
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	4	0.6	0.6	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	4	0.3	0.3	0	96	#
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	4	0.2	0.2	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	4	0.2	0.2	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	98	4	94	93	1	92	90

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	11	12/04/2024	12/04/2024		[NT]	[NT]
Date analysed	-			[NT]	11	12/04/2024	12/04/2024		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	11	0.8	0.7	13	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	11	0.8	0.8	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-022/025	[NT]	11	0.7	0.7	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	11	0.4	0.4	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	11	0.4	0.4	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	11	0.6	0.6	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	11	0.2	0.3	40	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	11	0.1	0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	11	0.1	0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	11	92	95	3	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	348566-8
Date extracted	-			12/04/2024	4	12/04/2024	12/04/2024		12/04/2024	12/04/2024
Date analysed	-			12/04/2024	4	12/04/2024	12/04/2024		12/04/2024	12/04/2024
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	86	82
HCB	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	92	86
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	88	74
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	98	92
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	92	92
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	94	102
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	104	106
Endrin	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	94	90
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	88	88
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	70	82
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Mirex	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	87	4	90	90	0	87	86

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	11	12/04/2024	12/04/2024		[NT]	[NT]
Date analysed	-			[NT]	11	12/04/2024	12/04/2024		[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
HCB	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Mirex	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	[NT]	11	85	87	2	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	348566-8
Date extracted	-			12/04/2024	4	12/04/2024	12/04/2024		12/04/2024	12/04/2024
Date analysed	-			12/04/2024	4	12/04/2024	12/04/2024		12/04/2024	12/04/2024
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	132	134
Mevinphos	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Phorate	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Disulfoton	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Parathion-Methyl	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	112	112
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	108	140
Malathion	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	98	132
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	110	114
Fenthion	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	112	138
Bromophos-ethyl	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Methidathion	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Fenamiphos	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	130	124
Phosalone	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Coumaphos	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	87	4	90	90	0	87	86

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	11	12/04/2024	12/04/2024		[NT]	[NT]
Date analysed	-			[NT]	11	12/04/2024	12/04/2024		[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Mevinphos	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Phorate	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Disulfoton	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Parathion-Methyl	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Fenthion	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Methidathion	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Fenamiphos	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Phosalone	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Coumaphos	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	[NT]	11	85	87	2	[NT]	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	348566-8
Date extracted	-			12/04/2024	4	12/04/2024	12/04/2024		12/04/2024	12/04/2024
Date analysed	-			12/04/2024	4	12/04/2024	12/04/2024		12/04/2024	12/04/2024
Aroclor 1016	mg/kg	0.1	Org-021/022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021/022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021/022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021/022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021/022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021/022/025	<0.1	4	<0.1	<0.1	0	97	100
Aroclor 1260	mg/kg	0.1	Org-021/022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Surrogate 2-Fluorobiphenyl	%		Org-021/022/025	91	4	93	90	3	90	85

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	11	12/04/2024	12/04/2024		[NT]	[NT]
Date analysed	-			[NT]	11	12/04/2024	12/04/2024		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-021/022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021/022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021/022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021/022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021/022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021/022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-021/022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate 2-Fluorobiphenyl	%		Org-021/022/025	[NT]	11	88	89	1	[NT]	[NT]

QUALITY CONTROL: Misc Soil - Inorg						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	348566-13
Date prepared	-			16/04/2024	4	16/04/2024	16/04/2024		16/04/2024	16/04/2024
Date analysed	-			16/04/2024	4	16/04/2024	16/04/2024		16/04/2024	16/04/2024
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	4	<5	<5	0	107	86

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	348566-8
Date prepared	-			12/04/2024	4	12/04/2024	12/04/2024		12/04/2024	12/04/2024
Date analysed	-			16/04/2024	4	16/04/2024	16/04/2024		16/04/2024	16/04/2024
Arsenic	mg/kg	4	Metals-020	<4	4	5	6	18	106	106
Cadmium	mg/kg	0.4	Metals-020	<0.4	4	0.6	0.5	18	104	91
Chromium	mg/kg	1	Metals-020	<1	4	16	21	27	103	74
Copper	mg/kg	1	Metals-020	<1	4	45	49	9	109	122
Lead	mg/kg	1	Metals-020	<1	4	76	76	0	102	96
Mercury	mg/kg	0.1	Metals-021	<0.1	4	<0.1	<0.1	0	95	103
Nickel	mg/kg	1	Metals-020	<1	4	10	14	33	103	96
Zinc	mg/kg	1	Metals-020	<1	4	270	250	8	100	88
Iron	mg/kg	10	Metals-020	<10	4	15000	25000	50	107	#
Manganese	mg/kg	1	Metals-020	<1	4	300	390	26	106	#
Beryllium	mg/kg	1	Metals-020	<1	4	<1	<1	0	107	106
Boron	mg/kg	10	Metals-020	<10	4	<10	<10	0	100	##
Molybdenum	mg/kg	1	Metals-020	<1	4	<1	1	0	104	83
Selenium	mg/kg	2	Metals-020	<2	4	<2	<2	0	102	99

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	11	12/04/2024	12/04/2024		[NT]	[NT]
Date analysed	-			[NT]	11	16/04/2024	16/04/2024		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	11	11	7	44	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	11	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	11	18	40	76	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	11	68	68	0	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	11	270	110	84	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	11	13	21	47	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	11	280	280	0	[NT]	[NT]
Iron	mg/kg	10	Metals-020	[NT]	11	22000	39000	56	[NT]	[NT]
Manganese	mg/kg	1	Metals-020	[NT]	11	840	680	21	[NT]	[NT]
Beryllium	mg/kg	1	Metals-020	[NT]	11	<1	<1	0	[NT]	[NT]
Boron	mg/kg	10	Metals-020	[NT]	11	<10	<10	0	[NT]	[NT]
Molybdenum	mg/kg	1	Metals-020	[NT]	11	1	1	0	[NT]	[NT]
Selenium	mg/kg	2	Metals-020	[NT]	11	<2	<2	0	[NT]	[NT]

QUALITY CONTROL: PFAS in Soils Short						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date prepared	-			12/04/2024	1	12/04/2024	12/04/2024		12/04/2024	[NT]
Date analysed	-			12/04/2024	1	12/04/2024	12/04/2024		12/04/2024	[NT]
Perfluorohexanesulfonic acid - PFHxS	µg/kg	0.1	Org-029	<0.1	1	<0.1	<0.1	0	119	[NT]
Perfluorooctanesulfonic acid PFOS	µg/kg	0.1	Org-029	<0.1	1	<0.1	<0.1	0	131	[NT]
Perfluorooctanoic acid PFOA	µg/kg	0.1	Org-029	<0.1	1	<0.1	<0.1	0	107	[NT]
6:2 FTS	µg/kg	0.1	Org-029	<0.1	1	<0.1	<0.1	0	99	[NT]
8:2 FTS	µg/kg	0.2	Org-029	<0.2	1	<0.2	<0.2	0	125	[NT]
Surrogate $^{13}C_8$ *PFOS*	%		Org-029	105	1	107	106	1	108	[NT]
Surrogate $^{13}C_2$ *PFOA*	%		Org-029	97	1	94	97	3	93	[NT]
Extracted ISTD $^{18}O_2$ *PFHxS*	%		Org-029	114	1	96	94	2	112	[NT]
Extracted ISTD $^{13}C_4$ *PFOS*	%		Org-029	99	1	88	88	0	99	[NT]
Extracted ISTD $^{13}C_4$ *PFOA*	%		Org-029	117	1	101	100	1	116	[NT]
Extracted ISTD $^{13}C_2$ *6:2FTS*	%		Org-029	141	1	111	108	3	139	[NT]
Extracted ISTD $^{13}C_2$ *8:2FTS*	%		Org-029	124	1	103	101	2	131	[NT]

QUALITY CONTROL: CEC						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			15/04/2024	[NT]	[NT]	[NT]	[NT]	15/04/2024	[NT]
Date analysed	-			15/04/2024	[NT]	[NT]	[NT]	[NT]	15/04/2024	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	105	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date prepared	-			15/04/2024	[NT]	[NT]	[NT]	[NT]	15/04/2024	[NT]
Date analysed	-			15/04/2024	[NT]	[NT]	[NT]	[NT]	15/04/2024	[NT]
pH 1:5 soil:$CaCl_2$	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	100	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

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

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

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

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

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

PAHs in Soil - # Percent recovery for the matrix spike is not possible to report as the high concentration of analytes in sample 348566-8ms have caused interference.

TRH_S_NEPM:# Percent recovery for the matrix spike is not possible to report as the high concentration of analytes in sample 348566-8ms have caused interference.

Acid Extractable Metals in Soil:
-The laboratory RPD acceptance criteria has been exceeded for 348566-4 for Fe. Therefore a triplicate result has been issued as laboratory sample number 348566-16.
-The laboratory RPD acceptance criteria has been exceeded for 348566-11 for Cr, Pb, Ni and Fe. Therefore a triplicate result has been issued as laboratory sample number 348566-17.
-# Percent recovery is not applicable due to the high concentration of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.
-## Poor spike recovery was obtained for this sample. Sample matrix interference is suspected. However, an acceptable recovery was obtained for the LCS.
-The PQL for 348566-8 has been raised for B due to the poor spike recovery/recoveries. This may reflect other samples where similar in matrix and similar analytical interferences occur.

Asbestos-ID in soil: NEPM
This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013. This is reported outside our scope of NATA accreditation.

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CERTIFICATE OF ANALYSIS 348566-A

Client Details

Client	Douglas Partners Newcastle
Attention	Jason Lambert
Address	Box 324 Hunter Region Mail Centre, Newcastle, NSW, 2310

Sample Details

Your Reference	**226269.01, Williamtown**
Number of Samples	Additional TCLP analysis
Date samples received	11/04/2024
Date completed instructions received	19/04/2024

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	29/04/2024
Date of Issue	29/04/2024

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Results Approved By
Loren Bardwell, Development Chemist
Sean McAlary, Chemist (FAS)
Timothy Toll, Senior Chemist

Authorised By
Nancy Zhang, Laboratory Manager

TCLP Preparation - Acid					
Our Reference		348566-A-6	348566-A-8	348566-A-11	348566-A-12
Your Reference	UNITS	117	118	119	119
Depth		0.0-0.1	0.0-0.1	0.0-0.1	0.5
Date Sampled		09/04/2024	09/04/2024	09/04/2024	09/04/2024
Type of sample		Soil	Soil	Soil	Soil
pH of soil for fluid# determ.	pH units	7.8	7.9	8.0	7.9
pH of soil TCLP (after HCl)	pH units	1.7	1.7	1.6	1.7
Extraction fluid used		1	1	1	1
pH of final Leachate	pH units	5.2	5.2	4.9	4.9

PAHs in TCLP (USEPA 1311)			
Our Reference		348566-A-6	348566-A-8
Your Reference	UNITS	117	118
Depth		0.0-0.1	0.0-0.1
Date Sampled		09/04/2024	09/04/2024
Type of sample		Soil	Soil
Date extracted	-	26/04/2024	26/04/2024
Date analysed	-	26/04/2024	26/04/2024
Naphthalene in TCLP	mg/L	<0.0001	<0.0001
Acenaphthylene in TCLP	mg/L	<0.0001	<0.0001
Acenaphthene in TCLP	mg/L	<0.0001	<0.0001
Fluorene in TCLP	mg/L	<0.0001	<0.0001
Phenanthrene in TCLP	mg/L	<0.0001	<0.0001
Anthracene in TCLP	mg/L	<0.0001	<0.0001
Fluoranthene in TCLP	mg/L	<0.0001	<0.0001
Pyrene in TCLP	mg/L	<0.0001	<0.0001
Benzo(a)anthracene in TCLP	mg/L	<0.0001	<0.0001
Chrysene in TCLP	mg/L	<0.0001	<0.0001
Benzo(bjk)fluoranthene in TCLP	mg/L	<0.0002	<0.0002
Benzo(a)pyrene in TCLP	mg/L	<0.0001	<0.0001
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	<0.0001	<0.0001
Dibenzo(a,h)anthracene in TCLP	mg/L	<0.0001	<0.0001
Benzo(g,h,i)perylene in TCLP	mg/L	<0.0001	<0.0001
Total +ve PAH's	mg/L	NIL (+)VE	NIL (+)VE
Surrogate p-Terphenyl-d14	%	74	82

Metals from Leaching Fluid pH 2.9 or 5		
Our Reference		348566-A-11
Your Reference	UNITS	119
Depth		0.0-0.1
Date Sampled		09/04/2024
Type of sample		Soil
Date extracted	-	29/04/2024
Date analysed	-	29/04/2024
Lead	mg/L	<0.03

PFAS in TCLP Short		
Our Reference		348566-A-12
Your Reference	UNITS	119
Depth		0.5
Date Sampled		09/04/2024
Type of sample		Soil
Date prepared	-	26/04/2024
Date analysed	-	26/04/2024
Perfluorohexanesulfonic acid - PFHxS	µg/L	<0.01
Perfluorooctanesulfonic acid PFOS	µg/L	<0.01
Perfluorooctanoic acid PFOA	µg/L	<0.01
6:2 FTS	µg/L	<0.01
8:2 FTS	µg/L	<0.02
Surrogate $^{13}C_8$ *PFOS*	%	112
Surrogate $^{13}C_2$ *PFOA*	%	97
Extracted ISTD $^{18}O_2$ *PFHxS*	%	96
Extracted ISTD $^{13}C_4$ *PFOS*	%	94
Extracted ISTD $^{13}C_4$ *PFOA*	%	106
Extracted ISTD $^{13}C_2$ *6:2FTS*	%	83
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	119
Total Positive PFHxS & PFOS	µg/L	<0.01
Total Positive PFOS & PFOA	µg/L	<0.01
Total Positive PFAS	µg/L	<0.01

Method ID	Methodology Summary
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using AS 4439. Please note that the mass used may be scaled down from default based on sample mass available. Samples are stored at 2-6oC before and after leachate preparation.
Metals-020	Determination of various metals by ICP-AES following buffer determination as per USEPA 1311 and hence AS 4439.3. Extraction Fluid 1 refers to the pH 5.0 buffer and Extraction Fluid 2 is the pH 2.9 buffer.
Org-022/025	Leachates are extracted with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-029	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLPs/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.4 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

QUALITY CONTROL: PAHs in TCLP (USEPA 1311)					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			26/04/2024	[NT]	[NT]	[NT]	[NT]	26/04/2024	[NT]
Date analysed	-			26/04/2024	[NT]	[NT]	[NT]	[NT]	26/04/2024	[NT]
Naphthalene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	[NT]	[NT]	[NT]	[NT]	89	[NT]
Acenaphthylene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	[NT]	[NT]	[NT]	[NT]	83	[NT]
Fluorene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	[NT]	[NT]	[NT]	[NT]	80	[NT]
Phenanthrene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	[NT]	[NT]	[NT]	[NT]	80	[NT]
Anthracene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	[NT]	[NT]	[NT]	[NT]	85	[NT]
Pyrene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	[NT]	[NT]	[NT]	[NT]	90	[NT]
Benzo(a)anthracene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	[NT]	[NT]	[NT]	[NT]	76	[NT]
Benzo(bjk)fluoranthene in TCLP	mg/L	0.0002	Org-022/025	<0.0002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	[NT]	[NT]	[NT]	[NT]	99	[NT]
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	0.0001	Org-022/025	<0.0001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	95	[NT]	[NT]	[NT]	[NT]	88	[NT]

QUALITY CONTROL: Metals from Leaching Fluid pH 2.9 or 5					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			29/04/2024	[NT]	[NT]	[NT]	[NT]	29/04/2024	[NT]
Date analysed	-			29/04/2024	[NT]	[NT]	[NT]	[NT]	29/04/2024	[NT]
Lead	mg/L	0.03	Metals-020	<0.03	[NT]	[NT]	[NT]	[NT]	99	[NT]

QUALITY CONTROL: PFAS in TCLP Short						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	348566-A-12
Date prepared	-			26/04/2024	12	26/04/2024	26/04/2024		26/04/2024	26/04/2024
Date analysed	-			26/04/2024	12	26/04/2024	26/04/2024		26/04/2024	26/04/2024
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.01	Org-029	<0.01	12	<0.01	<0.01	0	110	99
Perfluorooctanesulfonic acid PFOS	µg/L	0.01	Org-029	<0.01	12	<0.01	<0.01	0	124	105
Perfluorooctanoic acid PFOA	µg/L	0.01	Org-029	<0.01	12	<0.01	<0.01	0	102	94
6:2 FTS	µg/L	0.01	Org-029	<0.01	12	<0.01	<0.01	0	119	102
8:2 FTS	µg/L	0.02	Org-029	<0.02	12	<0.02	<0.02	0	105	101
Surrogate $^{13}C_8$ *PFOS*	%		Org-029	101	12	112	99	12	107	98
Surrogate $^{13}C_2$ *PFOA*	%		Org-029	95	12	97	97	0	98	97
Extracted ISTD $^{18}O_2$ *PFHxS*	%		Org-029	98	12	96	103	7	95	101
Extracted ISTD $^{13}C_4$ *PFOS*	%		Org-029	99	12	94	99	5	89	99
Extracted ISTD $^{13}C_4$ *PFOA*	%		Org-029	106	12	106	109	3	102	106
Extracted ISTD $^{13}C_2$ *6:2FTS*	%		Org-029	81	12	83	78	6	83	88
Extracted ISTD $^{13}C_2$ *8:2FTS*	%		Org-029	116	12	119	118	1	123	125

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

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

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

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

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

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Appendix H

Quality Assurance and Quality Control (QAQC) Report

1. Field and Laboratory Data Quality Assurance and Quality Control

The field and laboratory data quality assurance and quality control (QA/QC) procedures and results are summarised in the following Table 1. Reference should be made to the field work methodology and the laboratory results / certificates of analysis for further details. The relative percentage difference (RPD) results, along with the other field QC samples are included in Table QA1 to Table QA4 at the end of this appendix.

Table 1: Field and laboratory quality control

Item	Evaluation / acceptance criteria	Compliance
Analytical laboratories used	NATA accreditation	C
Holding times	Various based on type of analysis	C
Intra-laboratory replicates	10% of primary samples; <30% RPD	PC
Trip Spikes	1 per sampling event; 60-140% recovery	C
Trip Blanks	1 per sampling event; <PQL	C
Laboratory / Reagent Blanks	1 per batch; <PQL	C
Laboratory Duplicate	1 per lab batch; As laboratory certificate	PC
Matrix Spikes	1 per lab batch; 70-130% recovery (inorganics); 60-140% recovery (organics)	C
Surrogate Spikes	All organics analysis; 70-130% recovery (inorganics); 60-140% recovery (organics)	C
Control Samples	1 per lab batch; 70-130% recovery (inorganics); 60-140% recovery (organics)	C
Standard Operating Procedures (SOP)	Adopting SOP for all aspects of the sampling field work	C

Notes:
C = compliance; PC = partial compliance; NC = non-compliance

1.1 Field Replicates

The RPD results for field duplicates in soil were all within the acceptable range, with the exception of those indicated in Table QA1 (results in bold) and as follows:

- Field duplicates (soil) – Table QA1 – metals, PAH, TRH (C10-C36) and PAH (anthracene, dibenzo anthracene, fluoranthene, indeno pyrene, phenanthrene and pyrene).

The exceedances are not, however, considered to be of concern given that:

- The actual differences in the concentrations of the replicate pairs where RPD exceedances occurred were typically low, particularly for PAH exceedances;
- The replicate pairs were collected from fill soils which by its nature are heterogeneous;
- Replicates, rather than homogenised duplicates, were used to minimise risk of volatile loss, hence greater analytical variability between replicate pairs can be expected;
- Some of the recorded concentrations were relatively close to the PQL;
- The majority of RPD results from a replicate pair were within the acceptable limits;
- The concentrations within the majority of the samples with elevated RPDs were well below the site assessment criteria; and
- All other QA/QC parameters met the data quality indicators.

The RPD results for field duplicates in water were all within the acceptable range, with the exception of those indicated in Table QA2 (results in bold) and as follows:

- Field duplicate (water) – Table QA2 – copper and TRH (F2).

The exceedances are not, however, considered to be of concern given that:

- The actual differences in the concentrations of the replicate pairs where RPD exceedances occurred were typically low;
- The recorded concentrations were relatively close to the PQL;
- The majority of RPD results from a replicate pair were within the acceptable limits; and
- All other QA/QC parameters met the data quality indicators.

1.2 Laboratory Replicates

The RPD results were all within the acceptable range, with the exception of:

- Envirolab report 346566 and 348566 – metal (Fe, Cr, Pb, Ni, Mn, Zn, Cu) replicate pairs in soil.

The exceedances are not, however, considered to be of concern given that:

- Most of the RPD results from a replicate pair were within the acceptable limits;
- Samples with elevated RPDs were all from fill which by its nature are heterogeneous;
- Most of the replicate pairs had concentration of metals well below the site assessment criteria except for those discussed below;
- Triplicate analysis conducted by the laboratory indicated metal concentrations for the primary, duplicate and triplicate samples were generally all within the same order of magnitude except for those listed below; and
- All other QA/QC parameters met the data quality indicators.

Sample D1/LAH (field duplicate of sample 105/0-0.1m) had zinc concentrations ranging from 68mg/kg to 510mg/kg (average 196 mg/kg) between the primary, field duplicate and lab duplicate / triplicate samples, which exceeded the SAC for zinc in one of the four sample results. The results suggest the fill materials are heterogenous and / or the results are influenced by trace metal particulates observed within the fill.

The above results suggest that fill materials are heterogenous. On this basis care should be taken when interpreting results for fill materials with concentrations close to the site assessment criteria.

Zinc concentrations in replicate pairs 116/0-0.1m (250mg/kg to 270mg/kg) and 119/0-0.1m (270mg/kg to 280mg/kg) had results near to the SAC for zinc (ecological investigation limit of 300mg/kg). Minor exceedances of this ecological limit are not considered to be significant for the proposed development as development in the vicinity of Pits 116 and 119 comprises construction of a driveway (fill placement) overlying current site soils and therefore are not considered to be ecologically significant, if an exceedance was present.

1.3 Laboratory Notes

Laboratory notes from testing are summarised below:

- Envirolab report 346423 noted:
  - Extracted internal standards were outside the acceptable range, therefore some practical quantitation limits (PQL) have been raised. This is not considered to be of concern as the raised PQL remains orders of magnitude below the associated site assessment criteria.
- Envirolab report 348566 noted:
  - Matrix spike for PAH and TRH was not possible in 118/0-0.1m due to high concentration of analytes in sample. This is not considered to be of concern given the matrix spike analysis for other samples were within the acceptable limits and other QA/QC parameters met the data quality indicators for TRH and PAHs;
  - PQL raised in 115/0-0.1m due to high spike recovery. This is not considered to be of concern as the raised PQL remains orders of magnitude below the associated site assessment criteria.

1.4 Summary

In summary, the QC data is determined to be generally of sufficient quality to be considered acceptable for the assessment.

2. Data Quality Indicators

The reliability of field procedures and analytical results was assessed against the following data quality indicators (DQI) as outlined in NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013):

- Completeness: a measure of the amount of usable data from a data collection activity;
- Comparability: the confidence (qualitative) that data may be considered to be equivalent for each sampling and analytical event;
- Representativeness: the confidence (qualitative) of data representativeness of media present on-site;
- Precision: a measure of variability or reproducibility of data; and
- Accuracy: a measure of closeness of the data to the 'true' value.

Table 2: Data quality indicators

Data quality indicator	Method(s) of achievement
Completeness	Systematic and selected target locations sampled.
	Preparation of borehole/test pit logs, sample location plan and chain of custody records.
	Preparation of field groundwater sampling sheets.
	Laboratory sample receipt information received confirming receipt of samples intact and appropriateness of the chain of custody.
	Samples analysed for contaminants of potential concern (COPC) identified in the conceptual site model (CSM).
	Completion of chain of custody (COC) documentation.
	NATA accredited laboratory results certificates provided by the laboratory.
	Satisfactory frequency and results for field and laboratory quality control (QC) samples as discussed in Section 1.
Comparability	Using appropriate techniques for sample recovery, storage and transportation, which were the same for the duration of the project.
	Experienced sampler(s) used.
	Use of NATA registered laboratories, with test methods the same or similar between laboratories.
	Satisfactory results for field and laboratory QC samples.
Representativeness	Target media sampled.
	Sample numbers recovered and analysed are considered to be representative of the target media and complying with DQO.
	Samples were extracted and analysed within holding times.
	Samples were analysed in accordance with the COC.
Precision	Field staff followed standard operating procedures.
	Acceptable RPD between original samples and replicates.
	Satisfactory results for all other field and laboratory QC samples.
Accuracy	Field staff followed standard operating procedures.
	Satisfactory results for all field and laboratory QC samples.

Based on the above, it is considered that the DQI have been complied with.

3. Conclusion

Based on the results of the field QA and field and laboratory QC, and evaluation against the DQI it is concluded that the field and laboratory test data obtained are generally reliable and useable for this assessment.

4. Reference

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]*. Australian Government Publishing Services Canberra: National Environment Protection Council.

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Table QA1: Relative Percentage Difference Results – Soil Sampling

Lab Report No	Sample ID	Depth	Sample Date	Sample Type	Units	Metals													
						Total Arsenic	Beryllium	Boron	Cadmium	Total Chromium	Copper	Lead	Manganese	Mercury (inorganic)	Nickel	Selenium (Total)	Zinc	Iron	Molybdenum
346566	105	0 - 0.1 m	13/03/2024	Soil	mg/kg	<4	<1	<10	<0.4	**10**	**11**	**27**	**77**	<0.1	**5**	<2	**68**	**9,000**	<1
346566	D1/LAH	0 m	13/03/2024	Soil	mg/kg	<4	<1	<10	<0.4	**17**	**15**	**38**	**200**	<0.1	**9**	<2	**95**	**13,000**	<1
			Difference		mg/kg	0	0	0	0	7	4	11	123	0	4	0	27	4,000	0
			RPD		%	0%	0%	0%	0%	**52%**	**31%**	**34%**	**89%**	0%	**57%**	0%	**33%**	**36%**	0%
348566	118	0 - 0.1 m	09/04/24	Soil	mg/kg	**8**	**1**	<20	<0.4	**41**	**19**	**28**	**1,500**	<0.1	**9**	<2	**80**	**19,000**	<1
348566	D3/MJD	0 m	09/04/24	Soil	mg/kg	<4	<1	<10	<0.4	**10**	**16**	**21**	**490**	<0.1	**6**	<2	**61**	**12,000**	<1
			Difference		mg/kg	4	0	10	0	31	3	7	1,010	0	3	0	19	7,000	0
			RPD		%	**67%**	0%	**67%**	0%	**122%**	17%	29%	**102%**	0%	**40%**	0%	27%	**45%**	0%

Lab Report No	Sample ID	Depth	Sample Date	Sample Type	Units	PAH																TRH							
						Naphthalene [b]	Benzo(a)pyrene (B(a)P)	Benzo(a)pyrene TEQ (B(a)P TEQ)	Total PAH	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(g,h,i)perylene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	Pyrene	TRH C6 - C10	TRH >C10-C16	F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	TRH C6 - C9	TRH C10-C36
346566	105	0 - 0.1 m	13/03/2024	Soil	mg/kg	<1	**0.3**	<0.5	**2.4**	<0.1	<0.1	<0.1	**0.2**	**0.2**	**0.2**	<0.1	**0.5**	<0.1	**0.1**	**0.2**	**0.5**	<25	<50	<25	<50	**230**	<100	<25	**270**
346566	D1/LAH	0 m	13/03/2024	Soil	mg/kg	<1	**0.3**	<0.5	**3.4**	<0.1	<0.1	<0.1	**0.2**	**0.2**	**0.2**	<0.1	**0.7**	<0.1	**0.2**	**0.4**	**0.7**	<25	<50	<25	<50	**170**	<100	<25	**110**
			Difference		mg/kg	0	0	0	1	0	0	0	0	0	0	0	0.2	0	0.1	0.2	0.2	0	0	0	0	60	0	0	160
			RPD		%	0%	0%	0%	**34%**	0%	0%	0%	0%	0%	0%	0%	**33%**	0%	**67%**	**67%**	**33%**	0%	0%	0%	0%	30%	0%	0%	**84%**
348566	118	0 - 0.1 m	09/04/24	Soil	mg/kg	<1	**2.3**	**3.4**	**25**	<0.1	**0.5**	**0.6**	**1.8**	**2.3**	**1.5**	**0.3**	**4.4**	<0.1	**1.5**	**1.8**	**4.2**	<25	<50	<25	<50	**280**	**320**	<25	**380**
348566	D3/MJD	0 m	09/04/24	Soil	mg/kg	<1	**1.8**	**2.6**	**20**	<0.1	**0.4**	**0.4**	**1.4**	**1.8**	**1.2**	**0.2**	**3.5**	<0.1	**1.2**	**1.6**	**3.4**	<25	<50	<25	<50	**260**	**320**	<25	**360**
			Difference		mg/kg	0	0.5	0.8	5	0	0.1	0.2	0.4	0.5	0.3	0.1	0.9	0	0.3	0.2	0.8	0	0	0	0	20	0	0	20
			RPD		%	0%	24%	27%	22%	0%	22%	**40%**	25%	24%	22%	**40%**	23%	0%	22%	12%	21%	0%	0%	0%	0%	7%	0%	0%	5%

Lab Report No	Sample ID	Depth	Sample Date	Sample Type	Units	Phenols	OCP														
						Total Phenolics	DDT+DDE+DDD [c]	Aldrin + Dieldrin	Total Chlordane	Total Endosulfan	Endrin	Heptachlor	Hexachlorobenzene	Methoxychlor	Mirex	Heptachlor Epoxide	Endrin Aldehyde	alpha-BHC	beta-BHC	delta-BHC	Lindane
346566	105	0 - 0.1 m	13/03/2024	Soil	mg/kg	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
346566	D1/LAH	0 m	13/03/2024	Soil	mg/kg	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			Difference		mg/kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			RPD		%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
348566	118	0 - 0.1 m	09/04/24	Soil	mg/kg	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
348566	D3/MJD	0 m	09/04/24	Soil	mg/kg	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			Difference		mg/kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			RPD		%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Lab Report No	Sample ID	Depth	Sample Date	Sample Type	Units	OPP																PCB	BTEX			
						Chlorpyriphos	Azinphos methyl (Guthion)	Bromophos-ethyl	Chlorpyriphos-methyl	Diazinon	Dichlorvos	Dimethoate	Ethion	Ronnel (fenchlorphos)	Fenitrothion	Fenthion	Malathion	Parathion	Parathion-methyl	Methidathion	Fenamiphos	Total PCB	Benzene	Toluene	Ethylbenzene	Total Xylenes
346566	105	0 - 0.1 m	13/03/2024	Soil	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.5	<1	<1
346566	D1/LAH	0 m	13/03/2024	Soil	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.5	<1	<1
			Difference		mg/kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			RPD		%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
348566	118	0 - 0.1 m	09/04/24	Soil	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.5	<1	<1
348566	D3/MJD	0 m	09/04/24	Soil	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.5	<1	<1
			Difference		mg/kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			RPD		%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Table QA2: Relative Percentage Difference Results – Water Sampling

Lab Report No	Sample ID	Sample Date	Sample Type	Units	Metals - Dissolved																					TRH			
					Aluminium	Antimony	Total Arsenic	Barium	Beryllium	Boron	Cadmium	Total Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury (inorganic)	Molybdenum	Nickel	Selenium (Total)	Silver	Tin (inorganic, SnIV)	Uranium	Zinc	F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)
346423	102	13/03/24	Water	µg/L	<10	<1	**9**	**20**	<0.5	**220**	<0.1	<1	**2**	**2**	**16,000**	<1	**270**	<0.05	**2**	**7**	<1	<1	<1	<0.5	**40**	<10	**93**	**200**	<100
346423	D1/JCL	13/03/24	Water	µg/L	<10	<1	**9**	**19**	<0.5	**230**	<0.1	<1	**2**	<1	**16,000**	<1	**270**	<0.05	**2**	**6**	<1	<1	<1	<0.5	**39**	<10	<50	**190**	<100
		Difference		µg/L	0	0	0	1	0	10	0	0	0	1	0	0	0	0	0	1	0	0	0	0	1	0	43	10	0
		RPD		%	0%	0%	0%	5%	0%	4%	0%	0%	0%	**67%**	0%	0%	0%	0%	0%	15%	0%	0%	0%	0%	3%	0%	**60%**	5%	0%

Lab Report No	Sample ID	Sample Date	Sample Type	Units	BTEX						PAH																PFAS					
					Benzene	Toluene	Ethylbenzene	o-Xylene	m+p-Xylene	Total Xylenes	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Naphthalene	Benzo(a)pyrene (B(a)P)	Benzo(b,j+k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	Pyrene	Sum of detected PAH	PFOS	PFOA	PFHxS	6:2 FTS	8:2 FTS	Sum of detected PFAS
346423	102	13/03/24	Water	µg/L	<1	<1	<1	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**0.012**	**0.019**	**0.014**	<0.0004	<0.0004	**0.045**
346423	D1/JCL	13/03/24	Water	µg/L	<1	<1	<1	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**0.012**	**0.02**	**0.014**	<0.0004	<0.0004	**0.046**
		Difference		µg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		RPD		%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	0%	2%

Lab Report No	Sample ID	Sample Date	Sample Type	Units	VOC (excluding BTEX)																							
					1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2,2-tetrachloroethane	tetrachloroethene	1,1,2-trichloroethane	1,1,2-trichloroethylene	1,1-dichloroethane	1,1-Dichloroethene	1,1-dichloropropene	1,2,3-trichlorobenzene	1,2,3-trichloropropane	1,2,4-trichlorobenzene	1,2,4-trimethyl benzene	1,2-dibromo-3-chloropropane	1,2-dichlorobenzene	1,2-dichloroethane	1,2-dichloropropane	1,3,5-trimethyl benzene	1,3-dichlorobenzene	1,3-dichloropropane	1,4-dichlorobenzene	2,2-dichloropropane	2-chlorotoluene
346423	102	13/03/24	Water	µg/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
346423	D1/JCL	13/03/24	Water	µg/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
		Difference		µg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		RPD		%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Lab Report No	Sample ID	Sample Date	Sample Type	Units	4-chlorotoluene	4-isopropyl toluene	Bromobenzene	Bromochloromethane	Bromodichloromethane	Bromoform	carbon tetrachloride	Chloroethane	Vinyl Chloride	Chloroform	Chloromethane	cis-1,2-dichloroethene	cis-1,3-dichloropropene	Isopropylbenzene (cumene)	Cyclohexane	dibromochloromethane	Dibromomethane	Dichlorodifluoromethane	1,2-dibromoethane	hexachlorobutadiene	Bromomethane	Monochlorobenzene	n-butyl benzene	n-propyl benzene	sec-butyl benzene	Styrene (vinylbenzene)	Tert-butyl benzene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Trichlorofluoromethane	Sum of detected VOC
346423	102	13/03/24	Water	µg/L	<1	<1	<1	<1	<1	<1	<1	<10	<10	<1	<10	<1	<1	<1	<1	<1	<1	<10	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1
346423	D1/JCL	13/03/24	Water	µg/L	<1	<1	<1	<1	<1	<1	<1	<10	<10	<1	<10	<1	<1	<1	<1	<1	<1	<10	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1
		Difference		µg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		RPD		%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Table QA3: Trip Spike Results (% Recovery)

Sample ID	Sample Date	Media Being Sampled	Sample Type	Benzene	Toluene	Ethylbenzene	o-Xylene	m+p-Xylene	Lab Report No
TS/2024.04.09	09/04/24	Soil	Soil	103	103	102	102	102	348566
TSW1	13/03/24	Water	Water	113	113	115	115	115	346423

Table QA4: Trip Blank Results

Sample ID	Sample Date	Media Being Sampled	Sample Type	Units	Priority PAH	Priority TRH		TRH	BTEX				Lab Report No
					Naphthalene [b]	TRH C6 - C10	F1 ((C6-C10)-BTEX)	TRH C6 - C9	Benzene	Toluene	Ethylbenzene	Total Xylenes	
TB/2024.04.09	09/04/24	Soil	Soil	mg/kg	<1	<25	<25	<25	<0.2	<0.5	<1	<1	348566
TBW1	13/03/24	Water	Water	µg/L	<10	<1	<1	<1	<1	<2	<1	<1	346423