REPORT TO

NSW HEALTH INFRASTRUCTURE

ON

DETAILED SITE INVESTIGATION

FOR

PROPOSED MPS STAGE 5 DEVELOPMENT

AT

BLAYNEY DISTRICT HOSPITAL, 3 OSMAN STREET, BLAYNEY, NSW

Date: 23 June 2023
Ref: E35521PTrpt3

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Executive Summary

NSW Health Infrastructure ('the client') commissioned JK Environments (JKE) to undertake a Detailed Site Investigation (DSI) for the MPS Stage 5 development at Blayney District Hospital, 3 Osman Street, Blayney, NSW ('the site'). The site location is shown on Figure 1 and the investigation was confined to the site boundaries as shown on Figure 2.

JKE has previously undertaken several phases of investigation at the site. A summary of relevant information from these investigations is included in Section 2.

The proposed development is in the early planning stages and no proposed development plans/drawings have been provided. Based on the limited information provided, we understand that the proposed development would likely be constructed on grade, with minimal excavations for services trenches.

The primary aim of the investigation was to characterise the soil, soil vapour and groundwater contamination conditions in accessible areas in order to assess site risks in relation to contamination and establish whether remediation is required. A secondary aim was to provide preliminary waste classification data for off-site disposal of soil waste which may be generated during the proposed development works. The DSI objectives were to:

- Assess the soil, soil vapour and groundwater contamination conditions in accessible areas;
- Assess the potential risks posed by contamination to the receptors identified in the Conceptual Site Model (CSM);
- Provide a preliminary waste classification for the in-situ soil; and
- Inform the preparation of a Remediation Action Plan (RAP).

The scope of work included the following:

- Review of site information, including background and site history information as outlined in the report;
- Review and update of the CSM;
- Design and implementation of a sampling, analysis and quality plan (SAQP). The SAQP was prepared prior to the commencement of the DSI and is attached in the appendices;
- Interpretation of the analytical results against the adopted Site Assessment Criteria (SAC);
- Data Quality Assessment; and
- Preparation of a report including a Tier 1 risk assessment.

Soil sampling was undertaken from 23 boreholes, soil vapour sampling from two vapour implants and groundwater sampling from six monitoring wells (three new and three existing). The following potential contamination sources were identified at the site: fill material; fuel storage onsite (redundant underground storage tank [UST] and above ground storage tank [AST]); use of pesticides; hazardous building materials (former and existing buildings and structures); naturally occurring asbestos; and off-site land uses (upgradient ambulance station former UST and motor mechanic).

The boreholes drilled for the DSI encountered fill materials to depths of approximately 0.1m below ground level (BGL) to 1.4mBGL, underlain by silty or clayey residual soils. The fill contained inclusions of ironstone, igneous and sandstone gravel, sand, glass, slag, ash, mulch and root fibres. There was no fibre cement fragments (FCF)/asbestos containing material (ACM) identified in any of the bulk asbestos quantification field screening samples.

Potential health-based risks associated with asbestos (identified during the Preliminary Site Investigation - PSI), arsenic and chromium in fill soil. Based on the current data, the risks associated with the heavy metals in fill soils are likely to be low, however further risk assessment is required. Ecological risks from fill soil were assessed to be low and acceptable.

JKE is of the opinion that potential risks associated with groundwater at the site are low in the context of the proposed development and are not indicative of site contamination that warrants remediation. Risks associated with soil vapour were also assessed to be low, however, further sampling and risk assessment is required to confirm this.

Remediation of the site will be required. Additional investigation and risk assessment are also required. However, we consider that it would be reasonable to include the requirements for further investigation within the Remediation Action Plan (RAP) because a large portion of this work will need to occur after demolition. Additional details of the proposed development will also be required to carry out the risk assessment (e.g. details of buildings being retained or demolished, proposed building footprints and finished floor levels, earthworks levels, locations of car parks and landscaped areas etc).

We anticipate that as a minimum remediation will address the occurrence of asbestos in fill in BH3 and potential impacts in the vicinity of the UST. It is expected that remediation will include the removal/off-site disposal of fill where practicable. Long-term management of contamination may be necessary in the event that contamination remains on site. In our opinion the scope of remediation will not need to extend to groundwater in the context of rendering the site suitable for the proposed development.

We are of the opinion that the site can be made suitable for the proposed hospital development via remediation.

We recommend the following:

1. Prepare an asbestos management plan (AMP) to manage asbestos in soil risks in the context of the on-going use of the site as a hospital. This AMP will need to remain in force until the redevelopment occurs;
2. Prior to preparation of the RAP, a preliminary site-specific human health risk assessment (HHRA) is to be undertaken by a specialist consultant;
3. Preparation and implementation of a RAP. In addition to the remediation and validation of fill and the UST area, the RAP is to include requirements for a post-demolition investigation(s) to adequately address the data gaps discussed in Section 9.3 of this report;
4. Following the additional investigation(s), the HHRA is to be updated and finalised. Should the final HHRA alter the strategies or the extent of remediation defined in the RAP, an addendum RAP must be prepared and implemented; and
5. Preparation of a validation assessment report for the remediation works undertaken at the site.

If not already undertaken, a Hazardous Building Materials Assessment (HAZMAT) must be undertaken for the existing buildings/structures at the site prior to the commencement of demolition work.

A summary of the preliminary waste classifications is included in Section 8.

The conclusions and recommendations should be read in conjunction with the limitations presented in the body of this report.

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Attachments

Abbreviations

Asbestos Fines/Fibrous Asbestos	**AF/FA**
Ambient Background Concentrations	**ABC**
Added Contaminant Limits	**ACL**
Asbestos Containing Material	**ACM**
Australian Drinking Water Guidelines	**ADWG**
Area of Environmental Concern	**AEC**
Australian Height Datum	**AHD**
Asbestos Management Plan	**AMP**
Acid Sulfate Soil	**ASS**
Above-Ground Storage Tank	**AST**
Before You Dig Australia	**BYDA**
Below Ground Level	**BGL**
Benzo(a)pyrene Toxicity Equivalent Factor	**BaP TEQ**
Benzene, Toluene, Ethylbenzene, Xylene	**BTEX**
Cation Exchange Capacity	**CEC**
Contaminated Land Management	**CLM**
Contaminant(s) of Potential Concern	**CoPC**
Chain of Custody	**COC**
Conceptual Site Model	**CSM**
Data Quality Indicator	**DQI**
Data Quality Objective	**DQO**
Detailed (Stage 2) Site Investigation	**DSI**
Ecological Investigation Level	**EIL**
Ecological Screening Level	**ESL**
Environment Protection Authority	**EPA**
Fibre Cement Fragment(s)	**FCF**
General Approval of Immobilisation	**GAI**
Ground Penetrating Radar	**GPR**
Hazardous Building Materials Survey	**HAZMAT**
Human Health Risk Assessment	**HHRA**
Health Investigation Level	**HILs**
Health Screening Level	**HSL**
Health Screening Level-Site Specific Assessment	**HSL-SSA**
International Organisation of Standardisation	**ISO**
JK Environments	**JKE**
JK Geotechnics	**JKG**
Lab Control Spike	**LCS**
Light Non-Aqueous Phase Liquid	**LNAPL**
Map Grid of Australia	**MGA**
National Association of Testing Authorities	**NATA**
National Environmental Protection Measure	**NEPM**
Organochlorine Pesticides	**OCP**
Organophosphate Pesticides	**OPP**
Polycyclic Aromatic Hydrocarbons	**PAH**
Polychlorinated Biphenyls	**PCBs**
Photo-ionisation Detector	**PID**
Protection of the Environment Operations	**POEO**
Practical Quantitation Limit	**PQL**
Quality Assurance	**QA**
Quality Control	**QC**
Remediation Action Plan	**RAP**
Relative Percentage Difference	**RPD**
Site Assessment Criteria	**SAC**

Sampling, Analysis and Quality Plan	**SAQP**
State Environmental Planning Policy	**SEPP**
Site Specific Assessment	**SSA**
Source, Pathway, Receptor	**SPR**
Specific Contamination Concentration	**SCC**
Standard Penetration Test	**SPT**
Standing Water Level	**SWL**
Trip Blank	**TB**
Toxicity Characteristic Leaching Procedure	**TCLP**
Total Recoverable Hydrocarbons	**TRH**
Trip Spike	**TS**
Upper Confidence Limit	**UCL**
United States Environmental Protection Agency	**USEPA**
Underground Storage Tank	**UST**
Virgin Excavated Natural Material	**VENM**
Volatile Organic Compounds	**VOC**
World Health Organisation	**WHO**
Work Health and Safety	**WHS**

Units

Litres	**L**
Metres BGL	**mBGL**
Metres	**m**
Millivolts	**mV**
Millilitres	**ml or mL**
Milliequivalents	**meq**
micro Siemens per Centimetre	**µS/cm**
Micrograms per Litre	**µg/L**
Milligrams per Kilogram	**mg/kg**
Milligrams per Litre	**mg/L**
Parts Per Million	**ppm**
Percentage	**%**
Percentage weight for weight	**%w/w**

1 INTRODUCTION

NSW Health Infrastructure ('the client') commissioned JK Environments (JKE) to undertake a Detailed Site Investigation (DSI) for the MPS Stage 5 development at Blayney District Hospital, 3 Osman Street, Blayney, NSW ('the site'). The site location is shown on Figure 1 and the investigation was confined to the site boundaries as shown on Figure 2.

JKE has previously undertaken several phases of investigation at the site. A summary of relevant information from these investigations is included in Section 2.

1.1 Proposed Development Details

The proposed development is in the early planning stages and no proposed development plans/drawings have been provided. Based on the limited information provided, we understand that the proposed development would likely be constructed on grade, with minimal excavations for services trenches.

1.2 Aim and Objectives

The primary aim of the investigation was to characterise the soil, soil vapour and groundwater contamination conditions in accessible areas in order to assess site risks in relation to contamination and establish whether remediation is required. A secondary aim was to provide preliminary waste classification data for off-site disposal of soil waste which may be generated during the proposed development works.

The DSI objectives were to:

- Assess the soil, soil vapour and groundwater contamination conditions in accessible areas;
- Assess the potential risks posed by contamination to the receptors identified in the Conceptual Site Model (CSM);
- Provide a preliminary waste classification for the in-situ soil; and
- Inform the preparation of a Remediation Action Plan (RAP).

1.3 Scope of Work

The investigation was undertaken generally in accordance with a JKE proposal (Ref: EP57148PT-Variation1) of 24 March 2023 and written acceptance from The APP Group acting on behalf of the client of 28 April 2023. The scope of work included the following:

- Review of site information, including background and site history information as outlined in the report;
- Review and update of the CSM;
- Design and implementation of a sampling, analysis and quality plan (SAQP). The SAQP was prepared prior to the commencement of the DSI and is attached in the appendices;
- Interpretation of the analytical results against the adopted Site Assessment Criteria (SAC);
- Data Quality Assessment; and
- Preparation of a report including a Tier 1 risk assessment.

The scope of work was undertaken with reference to the National Environmental Protection (Assessment of Site Contamination) Measure 1999 as amended (2013)[1], other guidelines made under or with regards to the Contaminated Land Management Act (1997)[2] and State Environmental Planning Policy (Resilience and Hazards) 2021[3] (formerly known as SEPP55). A list of reference documents/guidelines is included in the appendices.

[1] National Environment Protection Council (NEPC), (2013). *National Environmental Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013).* (referred to as NEPM 2013)

[2] Contaminated Land Management Act 1997 (NSW) (referred to as CLM Act 1997)

[3] *State Environmental Planning Policy (Resilience and Hazards) 2021* (NSW) (referred to as SEPP Resilience and Hazards 2021)

2 SITE INFORMATION

2.1 Previous JKE Investigations

JKE has undertaken several phases of investigation at the site, relevant information is summarised in the table below:

Table 2-1: Summary of Previous Investigations and Relevant Findings

Investigation phase	Relevant findings to the site
Desktop, JKE 2022a[4]	JKE undertook a Desktop in November 2022. The Desktop included a review of site information, including background and site history information from various sources, and a site walkover inspection. During the site inspection, a NSW Health representative (Brian Harvey) from the hospital indicated that a 500L diesel underground storage tank (UST) was located beneath the lawn between the maintenance building and the main carpark at the front of the hospital (refer to Figure 2). The UST was indicated to have been decommissioned circa 1999. The NSW Ambulance Station located to the west of the site was also inspected during the site walkover. A representative from NSW Ambulance indicated that a diesel UST and associate bowser had previously been located on the premises and were remediated/removed circa 2010 (refer to Figure 2). Based on the information reviewed and the site inspection, JKE identified the following potential contamination sources/areas of environmental concern (AEC): fill material – unknown origin; fuel storage onsite – abandoned diesel UST and above-ground storage tank (AST); use of pesticides – around site and beneath buildings/structures; hazardous building materials – former and existing buildings and structures; naturally occurring asbestos – mapped within the regional geological formation; and off-site land uses (upgradient ambulance station with a former UST, and a motor mechanic). Considering the findings and based on a qualitative assessment of various lines of evidence, JKE was of the opinion that there is a potential for site contamination. Based on the potential contamination sources/AEC identified, and the potential for contamination, further investigation of the contamination conditions was considered to be required. The following was recommended to better assess the risks associated with potential contamination at the site: • A preliminary intrusive investigation should be undertaken as a first step to make an initial assessment of the soil and groundwater contamination conditions and better inform the scope of the DSI; • Following the preliminary intrusive investigation, a SAQP should be prepared for the DSI; • A DSI should be undertaken to characterise the site contamination conditions and establish whether the site is suitable for the proposed development, or whether remediation is required; and • A hazardous building materials survey should be undertaken prior to demolition of the buildings. Following demolition of the buildings (and preferably prior to removal of the hardstand), an asbestos clearance certificate should be obtained.

[4] JK Environments, (2022a). *Report to Health Infrastructure on Desktop Preliminary (Stage 1) Site Investigation for Proposed MPS Stage 5 Development at 3 Osman Street, Blayney, NSW.* (Ref: E35521PTrpt, dated 30 November 2022) (referred to as Desktop)

Investigation phase	Relevant findings to the site
PSI, JKE 2022b[5]	To address the first recommendation of the Desktop, an intrusive Preliminary Site Investigation (PSI) was undertaken. The PSI included a review of existing project information, a site inspection, soil sampling from 10 boreholes and groundwater sampling from three monitoring wells installed at the site. The boreholes encountered fill materials to depths of approximately 0.3m below ground level (BGL) to 1.2mBGL, underlain by silty or clayey residual soils. The fill contained inclusions of brick and tile fragments, igneous, ironstone and sandstone gravel, clay nodules, slag, ash, coal and root fibres. There was no fibre cement fragments (FCF)/asbestos containing material (ACM) identified in any of the bulk asbestos quantification field screening samples. A selection of soil and groundwater samples were analysed for the contaminants of potential concern (CoPC). Chromium and asbestos (as asbestos fines [AF]/fibrous asbestos [FA]) were identified in fill/soil at concentrations that exceeded the health based site assessment criteria (SAC). In groundwater, total recoverable hydrocarbons (TRH) F2 was reported above the health based SAC and zinc was reported above the ecological SAC. Asbestos was not identified in the natural soil samples analysed for the PSI. Rock was not encountered to the maximum depth of investigation, 6.45mBGL, during the PSI. The PSI did not identified contamination that would preclude the proposed development/use of the site. However, the report indicated that a DSI is required to facilitate development of a RAP and remediation will be required to render the site suitable for the proposed development. We recommended the following: 1. Prepare a SAQP for the DSI; 2. Undertake a DSI in accordance with the SAQP; and 3. Develop and implement a RAP based on the combined findings of the PSI and DSI. Any requirements documented in a RAP are to be implemented and the site is to be remediated and validated.

An SAQP (attached in the appendices), was prepared for the DSI to address recommendation 1 of the PSI, and the DSI was undertaken to address recommendation 2 of the PSI.

2.2 Site Identification

Table 2-2: Site Identification

Current Site Owner (certificate of title):	Health Administration Board
Site Address:	3 Osman Street, Blayney, NSW
Lot & Deposited Plan:	Lot 2 in DP1097082
Current Land Use:	Hospital
Proposed Land Use:	Continued use as a hospital

[5] JK Environments, (2022b). *Report to Health Infrastructure on Preliminary (Stage 1) Site Investigation for Proposed MPS Stage 5 Development at 3 Osman Street, Blayney, NSW.* (Ref: E35521PTrpt2, dated 23 December 2022) (referred to as PSI)

Local Government Area (LGA):	Blayney Shire Council
Current Zoning:	R1: General Residential
Site Area (a) (approx.):	1.37Ha
RL (AHD in m) (approx.):	870-880
Geographical Location (decimal degrees) (approx. centre of site):	Latitude: -33.5378491 Longitude: 149.250869
Site Plans:	Appendix A

2.3 Site Location and Regional Setting

The site is located in a predominantly residential area of Blayney and is bound by Martha Street to the south (the Mid Western Highway) and Osman Street to the east. The site is located approximately 445m to the south-west of a tributary of the Belubula River.

The regional topography is characterised by a north-east facing hillside that falls towards the Belubula River. The site is located mid-slope and has a gentle fall towards the north-east at approximately 1°-3°. Parts of the site appear to have been levelled to account for the slope and accommodate the existing development.

2.4 Site Description

The most recent site walkover was undertaken by JKE as part of the DSI on 17 May 2023. The site was occupied by Blayney District Hospital. The main hospital building was positioned in the centre of the site, car parks were located to the east (patient/general public) and to the west (staff) of the main building, and an access road ran along the south of the site.

The main hospital building was separated into five adjoining buildings comprising the emergency department, hospital wards, offices and clinical, day-care centre, and the maintenance building. A separate aged care home was located to the north, and several carports (including a flammable liquids store) were located to the west. All buildings and structures were single storey, and of an age indicative of potentially housing hazardous building materials (i.e. asbestos and lead paint).

The car parks and access road/driveway were all asphaltic concrete paved and numerous concrete paved pathways were located around the buildings.

A disused diesel 500L AST was observed in the maintenance building adjacent to the former back-up generator (refer to Figure 2). A small amount of staining was observed on the surrounding concrete slab ground surface during the inspection. A grease trap was also observed at the rear of the main hospital building (refer to Figure 2).

As noted during the previous site inspection for the PSI, a small quantity of petrol fuel (approximately 5-10L) was observed to be stored in the rear carport flammable liquids store. This fuel was indicated to be used for the onsite mower. No odours or staining were observed on the surrounding ground surfaces during the inspection and this type of fuel storage was not considered to be a potential source of contamination considering the very small quantities involved.

General waste storage (locked skip bins) identified at rear of the main hospital building (west). No other drums, chemical or waste storage was observed on the site during the inspection.

Fill material (igneous gravels, brick and concrete fragments, etc.) were observed at the site surface in unpaved areas and generally along the southern batter and beneath the newer emergency department building, indicating that some filling had likely occurred at the site for the current development and levelling purposes.

Surface water flows would be expected to flow to the north-east in keeping with the localised fall of the site. Several surface drains were observed in the paved sections of the site and these would be expected to drain into the regional stormwater systems.

Outside of paved or gravel covered areas the site was generally grass covered, with a number of medium to large trees along the southern, eastern and northern boundaries and within garden areas. No obvious signs of plant stress or dieback were observed.

2.5 Surrounding Land Use

During the site inspection, JKE observed the following land uses in the immediate surrounds:

- North – Residential properties including a hostel;
- South – Martha Street and residential properties beyond;
- East – Osman Street and residential properties beyond; and
- West – NSW Ambulance station including a former diesel UST, residential and commercial properties (including a mechanic - Blayney Pit Stop Autos).

the previous JKE reports indicated that the adjacent and upgradient NSW Ambulance Station to the west of the site is a potential off-site contamination source due to the (former) presence of at least one UST. The upgradient mechanic may also be an off-site source of contamination. However, we note that the limited groundwater sampling for the PSI did not identify unacceptable groundwater impacts in the western area of the site.

2.6 Underground Services

The 'Before You Dig Australia' (BYDA) plans were reviewed for the investigation in order to establish whether any major underground services exist at the site or in the immediate vicinity that could act as a preferential pathway for contamination migration. Major services were not identified that would be expected to act as preferential pathways for contamination migration.

2.7 Summary of Site History Information

A time line summary of the historical land uses and activities is presented in the table below. The information presented in the table is based on a weight of evidence assessment of the site history documentation and observations made by JKE during the Desktop.

Table 2-3: Summary of Historical Land Uses/Activities

Year(s)	Potential Land Use/Activities
1886-1974	On-site: • Land dedicated for hospital use; • Development of the site for the original hospital; • Some filling of the site likely occurred for levelling purposes and around services; • Use of pesticides beneath buildings and around site; and • Hazardous building materials (i.e. asbestos and lead in paint) may have been used in original structures. Surrounding Area: • Vacant and residential land uses.
1974-2003	On-site: • Ongoing redevelopment of the site including construction of existing buildings, pathways and vehicle access (driveways and car parks); • Some filling of the site likely occurred for levelling purposes and around services; • Use of pesticides beneath buildings and around site; • Hazardous building materials (i.e. asbestos and lead in paint) may have been used in existing structures; • Installation and abandonment of diesel UST (circa 1999); • Installation and abandonment of diesel AST (circa 1999); and • Installation and use of grease trap (ongoing). Surrounding Area: • Ongoing residential development; and • Adjacent NSW Ambulance premises, remediation/removal of associated diesel UST and bowser (circa 2010).

3 GEOLOGY AND HYDROGEOLOGY

3.1 Regional Geology

Regional geological information reviewed for the previous investigations indicated that the site is underlain by Wombiana Formation Shale, which typically consists of buff to light coloured shales, siltstone, limestones and fine-grained sandstones and marble.

It is also noted that the Blayney Volcanics are mapped as being located approximately 300m to the south-west which have a medium potential for naturally occurring asbestos.

The Soil Landscape information indicated that the site is located within the Vittoria-Blayney soil landscape. Vittoria-Blayney soils are characterised by moderate erodibility with some higher local occurrences and low salinity.

A summary of the subsurface conditions encountered during the PSI is presented in the following table:

Table 3-1: Summary of Subsurface Conditions

Profile	Description
Fill	Fill was encountered at the surface or beneath the pavement in all boreholes and extended to depths of approximately 0.3mBGL to 1.2mBGL. BH10 was terminated in the fill at a maximum depth of approximately 0.6mBGL. The fill typically comprised clayey sand, gravelly clayey sand, silty clay with inclusions of brick and tile fragments, igneous, ironstone and sandstone gravel, clay nodules, slag, ash, coal and root fibres. No odours or staining were recorded in the fill material during field work. No FCF/ACM was encountered in the fill material during fieldwork.
Natural Soil	With the exception of BH10, natural residual silty clay or clayey silt soil was encountered beneath the fill material in all boreholes and extended to the maximum termination depth of the investigation at 6.45mBGL. No odours or staining were recorded in the natural soils during field work.
Groundwater	Groundwater seepage was encountered in BH3, BH5, BH6, BH17 and BH20 during drilling between 1.4mBGL and 6mBGL. SWLs measured in BH1, BH12, BH14, BH15 and BH20 on completion of drilling or a short time after ranged between 0.8mBGL and 5.4mBGL. All other boreholes remained dry on completion and a short time after drilling.

3.2 Acid Sulfate Soil (ASS) Risk and Planning

ASS information reviewed for the previous investigation indicated that the site is not located in an ASS risk area.

3.3 Hydrogeology

Hydrogeological information reviewed for the previous investigation indicated that the regional aquifer on-site and in the area immediately surrounding the site includes fractured or fissured, extensive aquifers of low to moderate productivity. There was a total of 29 registered bores within the report buffer of 2,000m. In summary:

- The nearest registered bore was located approximately 215m south of the site. This was utilised for stock and domestic purposes;
- The majority of the bores were registered for water supply purposes;
- There closest down gradient bore was approximately 380m to the north-east of the site and was registered for water supply use; and
- The drillers log information from the closest registered bores typically identified fill and/or clay soil to depths of 8m-66m, underlain by shale or granite bedrock. Standing water levels (SWLs) in the bores ranged from 1mBGL to 30mBGL.

Groundwater seepage was encountered in BH3, BH5, BH6, BH17 and BH20 during drilling for the PSI between 1.4mBGL and 6mBGL. SWLs measured in BH1, BH12, BH14, BH15 and BH20 on completion of drilling or a short time after ranged between 0.8mBGL and 5.4mBGL. All other boreholes remained dry on completion and a short time after drilling.

Table 3-2: Summary of Field Screening Information from PSI

<table>
<tr><th>Aspect</th><th>Details</th></tr>
<tr><td>Groundwater Depth & Flow</td><td>SWLs measured in the monitoring wells installed at the site ranged from 0.81mBGL to 4.38mBGL. Survey levels of the wells ranged from 873.70mAHD to 876.22mAHD. Groundwater RLs calculated on these measurements ranged from 78.60m to 82.83m.

<table>
<tr><th>MW reference</th><th>Reduced Level (mAHD)</th><th>SWL
(28 October 2022)</th><th>SWL (mAHD)</th></tr>
<tr><td>MW1</td><td>873.70</td><td>4.38</td><td>869.32</td></tr>
<tr><td>MW12</td><td>875.46</td><td>3.43</td><td>872.03</td></tr>
<tr><td>MW15</td><td>876.22</td><td>0.81</td><td>875.41</td></tr>
</table>

A contour plot was prepared for the groundwater levels as shown on Figure 5 included in the PSI. Groundwater flow generally occurs in a down gradient direction perpendicular to the groundwater elevation contours. The contour plot indicates that groundwater generally flows towards the north/north-east. This was consistent with expectations based on the topography and the location of the Belubula River. The groundwater flow direction has been reassessed under the scope of the DSI as discussed later in this report, and the flow direction is shown on Figure 5 in Appendix A.</td></tr>
<tr><td>Groundwater Field Parameters</td><td>Field measurements recorded during sampling were as follows:
- pH ranged from 5.81 to 6.35;
- EC ranged from 172.2µS/cm to 675µS/cm;
- Eh ranged from 57.1mV to 77.7mV; and
- DO ranged from 5.0mg/L to 6.8ppm.</td></tr>
<tr><td>LNAPLs petroleum hydrocarbons</td><td>Phase separated product (i.e. LNAPL) were not detected using the interphase probe during groundwater sampling.</td></tr>
</table>

3.4 Receiving Water Bodies

Surface water bodies were not identified in the immediate vicinity of the site. The closest surface water body is a tributary of the Belubula River located approximately 445m to the north-east of the site. This is down-gradient from site and is considered to be a potential receptor. The Belubula River proper is located approximately 795m to the north-east of the site at its closest point.

4 CONCEPTUAL SITE MODEL

NEPM (2013) defines a CSM as a representation of site related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. The CSM is presented in the SAQP attached in the appendices and is summarised below:

Table 4-1: Review of CSM

Contaminant source(s) and contaminants of concern	**Potential contamination sources/contaminating activities:** fill material; fuel storage; use of pesticides; hazardous building materials (asbestos and lead based paint) from existing or former structures; naturally occurring asbestos (bedrock); and off-site fuel storage and motor mechanics. **Contaminants of potential concern (CoPC)**: **Fill/soil:** Heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), petroleum hydrocarbons (referred to as total recoverable hydrocarbons – TRHs), benzene, toluene, ethylbenzene and xylene (BTEX), polycyclic aromatic hydrocarbons (PAHs), organochlorine pesticides (OCPs), organophosphate pesticides (OPPs), polychlorinated biphenyls (PCBs) and asbestos. **Soil vapour:** TRH/BTEXN and volatile organic compounds (VOCs), possibly including chlorinated solvents. **Groundwater:** Heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc); PAHs; TRHs; BTEX and VOCs.
Affected media	Soil, soil vapour and groundwater have been identified as potentially affected media.
Receptor identification	Human receptors include site occupants/users (including adults and children), construction workers and intrusive maintenance workers. Off-site human receptors include adjacent land users, groundwater users and recreational water users in down-gradient water bodies. Ecological receptors include terrestrial organisms and plants within unpaved areas (including any proposed landscaped areas), and freshwater ecology in the tributary of the Belubula River.
Exposure pathways and mechanisms	Potential exposure pathways relevant to the human receptors include ingestion, dermal absorption and inhalation of dust (all contaminants) and vapours (volatile TRH, naphthalene and BTEX), together with incidental contact with groundwater. The potential for exposure would typically be associated with the construction and excavation works, future use of the site, and off-site groundwater use or primary/secondary contact with groundwater. Potential exposure pathways for ecological receptors include primary contact and ingestion. Exposure during future site use could occur via direct contact with soil in unpaved areas such as gardens, inhalation of airborne asbestos fibres during soil disturbance, or inhalation of vapours within enclosed spaces such as buildings. Exposure to groundwater could occur in the tributary of the Belubula River through direct migration if there is groundwater to surface water connectivity. Exposure to groundwater could also occur as a result of groundwater abstraction from groundwater bores and use of groundwater for irrigation/stock watering. The following have been identified as potential exposure mechanisms for site contamination: • Vapour intrusion into the proposed basement and building/s (either from soil contamination or volatilisation of contaminants from groundwater);

	• Contact (dermal, ingestion or inhalation) with exposed soils in landscaped areas and/or unpaved areas; and • Possible disturbance of asbestos-containing natural bedrock formations during piling activities; • Migration of groundwater off-site and into nearby water bodies, including aquatic ecosystems and those used for recreation; and • Migration of groundwater off-site and into areas where groundwater is being utilised as a resource (i.e. for stock, irrigation and domestic uses).
Presence of preference pathways for contaminant movement	None identified. To be reviewed in the event mobile contamination impacts are encountered.

5 SAMPLING, ANALYSIS AND QUALITY PLAN

JKE prepared a stand-alone SAQP for the DSI which is attached in Appendix H. The SAQP can be summarised as follows:

- Data Quality Objectives (DQOs) were developed to define the type and quality of data required to achieve the project objectives outlined in Section 1.2;
- Soil samples were obtained from 23 boreholes (BH101 to BH122 and SV1) generally spread across the site, as shown on the attached Figure 2 in Appendix A;
- Soil samples were obtained using a combination of hand tools, drill rig equipped with spiral flight augers (150mm diameter), and mechanical excavator with 200mm pendulum auger attachment between 18 and 23 May 2023;
- Three additional monitoring wells were installed in BH101 (MW101), BH116 (MW116), and BH117 (MW117) during the DSI, as shown on Figure 2 in Appendix A. The wells were generally positioned to provide site coverage (MW101) and target the redundant UST in the east (MW116 and MW117);
- The monitoring well construction details are documented on the borehole log for BH101, BH116 and BH117 attached in the appendices;
- The two new monitoring wells (MW116 and MW117) were developed on 17 May 2023, and the existing monitoring wells (MW12, MW14 and MW15) and new monitoring well MW101 were developed on 18 May 2023. All wells were developed (i.e. water was pumped out) until they were effectively dry using a submersible electrical pump;
- The monitoring wells were allowed to recharge for six to seven days after development. Groundwater samples were obtained between 23 and 25 May 2023. Steady state conditions were achieved in all wells during sampling;
- Existing monitoring well MW1 was dry both on the day of development and the day of sampling;
- The field monitoring records and calibration data are attached in the appendices; and
- The relative heights of the new monitoring well locations, (MW101, MW116 and MW117) were surveyed using a GPS unit on 23 May 2023. RLs for the existing wells were previously recorded during the PSI. SWLs for all wells were checked between 23 and 25 May 2023. This information is documented in results Section 7.3.

5.1 Deviations to the SAQP

The following deviations to the SAQP are noted:

- The intent was to, where practicable, position the sampling location on a systematic plan with a grid spacing of approximately 24m between sampling locations. However, due to onsite obstructions including buildings, structures, buried services, and client requests to minimise disruptions to the hospital operations, the sampling locations were ultimately placed on a judgemental sampling plan and were broadly positioned for site coverage. This sampling plan was considered suitable to make an assessment of potential risks associated with the AEC and CoPC identified in the CSM, and assess whether further investigation/remediation is warranted;
- BH118 and BH119 were drilled marginally outside the southern site boundary due to access constraints associated with the batter slope;
- The fill was not penetrated in BH103, BH104, BH110, BH115 due to limitations associated with the use of hand equipment;

- Asbestos bulk quantification/field screening did not occur from BH116. The sample volumes for asbestos bulk quantification/field screening for a limited number of samples was below 10L. The low volume was due to the use of augers which limited the sample return particularly in subsurface fill profiles; and
- Due to concerns regarding the reinstatement of test pits, test pitting did not occur and all sampling occurred from boreholes using various equipment including hand augers, pendulum augers on the excavator and spiral augers on the drill rig.

Please refer to the SAQP attached in the appendices for further information.

5.2 Laboratory Analysis

Samples were analysed by an appropriate, NATA Accredited laboratory using the analytical methods detailed in Schedule B(3) of NEPM 2013. Reference should be made to the laboratory reports attached in the appendices for further details.

Table 5-1: Laboratory Details

Samples	Laboratory	Report Reference
All primary samples and field QA/QC samples including (intra-laboratory duplicates, trip blanks, trip spikes, field rinsate and shroud samples)	Envirolab Services Pty Ltd NSW, NATA Accreditation Number – 2901 (ISO/IEC 17025 compliance)	323727, 323727-A, 323727-B, 323727-C, 323728, 324180, 324186, 324186-A and 324186-B
Inter-laboratory duplicates	Envirolab Services Pty Ltd VIC, NATA Accreditation Number – 2901 (ISO/IEC 17025 compliance)	37508, 37622, and 37639

6 SITE ASSESSMENT CRITERIA (SAC)

The SAC were derived from the NEPM 2013 and other guidelines as discussed in the following sub-sections. The guideline values for individual contaminants are presented in the attached report tables and further explanation of the various criteria adopted is provided in the appendices.

6.1 Soil

Soil data were compared to relevant Tier 1 screening criteria in accordance with NEPM (2013) as outlined below.

6.1.1 Human Health

- Health Investigation Levels (HILs) for a 'residential with accessible soils, including childcare' land use exposure scenario (HIL-A). These criteria have been adopted to make a preliminary assessment of risks to the most sensitive receptors (i.e. children). In our opinion, the other generic land-use types in NEPM (2013) are less appropriate for a hospital land use scenario where there are relatively large unpaved/grassed/landscape areas;
- Health Screening Levels (HSLs) for a 'low-high density residential' exposure scenario (HSL-A & HSL-B). HSLs were calculated based on conservative assumptions including a 'sand' type and a depth interval of 0m to 1m;
- HSLs for direct contact presented in the CRC Care Technical Report No. 10 – Health screening levels for hydrocarbons in soil and groundwater Part 1: Technical development document (2011)[6]; and
- Asbestos was assessed on the basis of presence/absence and against the HSL-A criteria. A summary of the asbestos criteria is provided in the table below:

Table 6-1: Details for Asbestos SAC

Guideline	Applicability
Asbestos in Soil	The HSL-A criteria were adopted for the assessment of asbestos in soil. The SAC adopted for asbestos were derived from the NEPM 2013 and are based on the Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2021)[7]. The SAC include the following: • No visible asbestos at the surface/in the top 10cm of soil; • <0.01% w/w bonded asbestos containing material (ACM) in soil; and • <0.001% w/w asbestos fines/fibrous asbestos (AF/FA) in soil. Concentrations for bonded ACM concentrations in soil are based on the following equation which is presented in Schedule B1 of NEPM (2013): $\textbf{\% w/w asbestos in soil} = \dfrac{\textbf{\% asbestos content x bonded ACM (kg)}}{\text{Soil volume (L) x soil density (kg/L)}}$ However, we are of the opinion that the actual soil volume in a 10L bucket varies considerably due to the presence of voids, particularly when assessing cohesive soils. Therefore, each bucket sample was weighed using electronic scales and the above equation was adjusted as follows (we note that the units have also converted to grams):

[6] Cooperative Research Centre for Contamination Assessment and Remediation of the Environment (CRC Care), (2011). Technical Report No. 10 - *Health screening levels for hydrocarbons in soil and groundwater Part 1: Technical development document*

[7] Western Australian (WA) Department of Health (DoH), (2021). *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*. (referred to as WA DoH 2021)

Guideline	Applicability
	% w/w asbestos in soil = $\frac{\textbf{\% asbestos content x bonded ACM (g)}}{\text{Soil weight (g)}}$

6.1.2 Environment (Ecological – terrestrial ecosystems)

- Ecological Investigation Levels (EILs) and Ecological Screening Levels (ESLs) for an 'urban residential and public open space' (URPOS) exposure scenario. These have only been applied to the top 2m of soil as outlined in NEPM (2013). The criterion for benzo(a)pyrene has been increased from the value presented in NEPM (2013) based on the Canadian Soil Quality Guidelines[8];
- ESLs were adopted based on the soil type; and
- EILs for selected metals were generally calculated based on the most conservative added contaminant limit (ACL) values presented in Schedule B(1) of NEPM (2013) and published ambient background concentration (ABC) values presented in the document titled Trace Element Concentrations in Soils from Rural and Urban Areas of Australia (1995)[9]; and
- In several samples, EILs for selected metals were calculated using site-specific soil parameters for pH, cation exchange capacity (CEC) and clay content. These data have been tabulated below for reference and were used to select the ACL values presented in Schedule B(1) of NEPM (2013) to sum with the published ABC presented in Olszowy et al (1995). This method is considered to be adequate for the Tier 1 screening.

Table 6-2: Site Specific Soil Parameters

Location	Depth (m)	Material type	pH	CEC	Clay content
BH112	0-0.2	Fill: silty clay	-	8.5	-
BH112	0.4-0.6	Silty clay	-	11	-
BH116	0.015-0.45	Fill: gravelly clay	-	28	-
BH116	4.5-4.95	Silty gravelly clay	6.6	4.3	-
BH117	0-0.1	Fill: gravelly clay	8	22	6
BH117	3.0-3.4	Silty clay	5.9	11	-
SDUP101 (BH116)	0.015-0.45	Fill: gravelly clay	7.5	16	17

6.1.3 Management Limits for Petroleum Hydrocarbons

Management limits for petroleum hydrocarbons (as presented in Schedule B1 of NEPM 2013) were considered.

8 Canadian Council of Ministers of the Environment, (1999). *Canadian soil quality guidelines for the protection of environmental and human health: Benzo(a)Pyrene (1997)* (referred to as the Canadian Soil Quality Guidelines)

9 Olszowy, H., Torr, P., and Imray, P., (1995), *Trace Element Concentrations in Soils from Rural and Urban Areas of Australia. Contaminated Sites Monograph Series No. 4*. Department of Human Services and Health, Environment Protection Agency, and South Australian Health Commission (referred to as Olszowy et al 1995)

6.1.4 Waste Classification

Data for the waste classification assessment were assessed in accordance with the Waste Classification Guidelines, Part 1: Classifying Waste (2014)[10] as outlined in the following table:

Table 6-3: Waste Categories

Category	Description
General Solid Waste (non-putrescible)	• If Specific Contaminant Concentration (SCC) ≤ Contaminant Threshold (CT1) then Toxicity Characteristics Leaching Procedure (TCLP) not needed to classify the soil as general solid waste; and • If TCLP ≤ TCLP1 and SCC ≤ SCC1 then treat as general solid waste.
Restricted Solid Waste (non-putrescible)	• If SCC ≤ CT2 then TCLP not needed to classify the soil as restricted solid waste; and • If TCLP ≤ TCLP2 and SCC ≤ SCC2 then treat as restricted solid waste.
Hazardous Waste	• If SCC > CT2 then TCLP not needed to classify the soil as hazardous waste; and • If TCLP > TCLP2 and/or SCC > SCC2 then treat as hazardous waste.
Virgin Excavated Natural Material (VENM)	Natural material (such as clay, gravel, sand, soil or rock fines) that meet the following: • That has been excavated or quarried from areas that are not contaminated with manufactured chemicals, or with process residues, as a result of industrial, commercial mining or agricultural activities; • That does not contain sulfidic ores or other waste; and • Includes excavated natural material that meets such criteria for virgin excavated natural material as may be approved from time to time by a notice published in the NSW Government Gazette.

6.2 Soil Vapour

Soil vapour data were assessed against the HSL-A/B and interim HIL-A concentrations presented in Schedule B1 of NEPM (2013). Conservatively the HSLs will be derived using a 0-1m depth interval and a sand soil type. For VOC compounds detected above the PQL and for which there were no NEPM (2013) SAC, the USEPA vapour intrusion screening level calculator was used to derive screening criteria (see Table SV1 in the appendices for further details).

6.3 Groundwater

Groundwater data were compared to relevant Tier 1 screening criteria in accordance with NEPM (2013), following an assessment of environmental values in accordance with the Guidelines for the Assessment and Management of Groundwater Contamination (2007)[11]. Environmental values for this investigation include aquatic ecosystems, human uses, and human-health risks in non-use scenarios.

[10] NSW EPA, (2014). *Waste Classification Guidelines, Part 1: Classifying Waste.* (referred to as Waste Classification Guidelines 2014)

[11] NSW Department of Environment and Conservation, (2007). *Guidelines for the Assessment and Management of Groundwater Contamination.*

6.3.1 Human Health

- HSLs for a 'low-high density residential' exposure scenario (HSL-A/HSL-B). HSLs were calculated based on the soil type and the observed depth to groundwater;
- However, given the depth to groundwater during the PSI was recorded at a depth shallower than 2mBGL in at least one of the monitoring wells, (MW15), as a conservative approach, a combination of both the NEPM (2013) HSLs and a site-specific assessment (SSA) for the Tier 1 screening of human health risks posed by volatile contaminants in groundwater has been undertaken. The HSLs for a 'low-high density residential' exposure scenario (HSL-A/HSL-B) were adopted. HSLs were calculated based on the soil type and the observed depth to groundwater;
- For the SSA, the assessment included selection of alternative Tier 1 criteria that were considered suitably protective of human health. These criteria are based on drinking water guidelines and have been referred to as HSL-SSA. The criteria were based on the following (as shown in the attached report tables):
  - Australian Drinking Water Guidelines 2011 (updated 2021)[12] for BTEX compounds and selected VOCs;
  - World Health Organisation (WHO) document titled Petroleum Products in Drinking-water, Background document for the development of WHO Guidelines for Drinking Water Quality (2008)[13] for petroleum hydrocarbons. A SAC of 100µg/L was adopted for TRH F1 and F2;
  - USEPA Region 9 screening levels for naphthalene (threshold value for tap water); and
  - The use of the laboratory PQLs for other contaminants where there were no Australian guidelines; and
- The ADWG 2011 were multiplied by a factor of 10 to assess potential risks associated with incidental/recreational-type exposure to groundwater (e.g. within down-gradient water bodies and with bore water used for irrigation). These have been deemed as 'recreational' SAC; and
- ADWG 2011 criteria were adopted as screening criteria for consumption of groundwater.

6.3.2 Environment (Ecological - aquatic ecosystems)

Groundwater Investigation Levels (GILs) for 95% protection of freshwater species were adopted based on the Default Guideline Values in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2018)[14]. The 99% trigger values were adopted where required to account for bioaccumulation. Low and moderate reliability trigger values were also adopted for some contaminants where high-reliability trigger values don't exist.

[12] National Health and Medical Research Council (NHMRC), (2021). *National Water Quality Management Strategy, Australian Drinking Water Guidelines 2011* (referred to as ADWG 2011)

[13] World Health Organisation (WHO), (2008). *Petroleum Products in Drinking-water, Background document for the development of WHO Guidelines for Drinking Water Quality* (referred to as WHO 2008)

[14] Australian and New Zealand Governments (ANZG), (2018). *Australian and New Zealand Guidelines for Fresh and Marine Water Quality.* Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT, Australia (referred to as ANZG 2018)

7 RESULTS

7.1 Summary of Data (QA/QC) Evaluation

The data evaluation is presented in the appendices. In summary, JKE is of the opinion that the data are adequately precise, accurate, representative, comparable and complete to serve as a basis for interpretation to achieve the investigation objectives.

7.2 Subsurface Conditions

A summary of the subsurface conditions encountered during the investigation is presented in the following table. Reference should be made to the borehole logs attached in the appendices for further details.

Table 7-1: Summary of Subsurface Conditions

Profile	Description
Pavement	Asphaltic Concrete (AC) pavement was encountered at the surface in BH107, BH115, BH116 BH117 and BH122 and was 10mm to 30mm in thickness.
Fill	Fill was encountered at the surface or beneath the pavement in all boreholes and extended to depths of approximately 0.1mBGL to 1.4mBGL. BH103, BH104, BH110, BH115, SV1 and SV2 were terminated in the fill at a maximum depth of approximately 1.2mBGL. The fill typically comprised silty clay, silty clayey sand, gravelly clay, and gravelly sand with inclusions of ironstone, igneous and sandstone gravel, sand, glass, slag, ash, mulch and root fibres. No odours or staining were recorded in the fill material during field work. No FCF/ACM was encountered in the fill material during fieldwork.
Natural Soil	Natural residual silty clay or silty gravelly clay was encountered beneath the fill material in boreholes BH101, BH102, BH105 to BH109, BH111 to BH114, BH116 to BH122, and extended to the maximum termination depth of the investigation at 8mBGL. No odours or staining were recorded in the natural soils during field work.
Groundwater	Groundwater seepage was not encountered in any of the boreholes during drilling. SWLs were measured in BH101, BH116, and BH117 on completion of drilling at between 6.5mBGL and 7mBGL. All other boreholes remained dry on completion and a short time after drilling.

7.3 Field Screening

A summary of the field screening results is presented in the following table:

Table 7-2: Summary of Field Screening

Aspect	Details
PID Screening of Soil Samples for VOCs	PID soil sample headspace readings are presented in attached report tables and the COC documents attached in the appendices. The results ranged from 0ppm to 2.6ppm equivalent isobutylene. These results indicate a lack of significant PID detectable VOCs in the samples.

<table>
<tr><th>Aspect</th><th>Details</th></tr>
<tr><td>Bulk Screening for Asbestos</td><td>The bulk field screening results are summarised in the attached report Table S5. FCF/ACM was not encountered in any of the bulk screening samples during the DSI. All results were below the SAC.</td></tr>
<tr><td>Groundwater Depth & Flow</td><td>SWLs measured in the monitoring wells installed at the site ranged from 2.48mBGL to 4.28mBGL. Survey levels of the wells ranged from 873.42mAHD to 876.22mAHD. Groundwater RLs calculated on these measurements ranged from 869.14mAHD to 873.74mAHD.

<table>
<tr><th>MW reference</th><th>Reduced Level (mAHD)</th><th>SWLs</th><th>SWL (mAHD)</th></tr>
<tr><td>MW12</td><td>875.46</td><td>3.60</td><td>871.86</td></tr>
<tr><td>MW14</td><td>875.15</td><td>3.0</td><td>872.15</td></tr>
<tr><td>MW15</td><td>876.22</td><td>2.48</td><td>873.74</td></tr>
<tr><td>MW101</td><td>873.42</td><td>4.28</td><td>869.14</td></tr>
<tr><td>MW116</td><td>873.90</td><td>3.16</td><td>870.74</td></tr>
<tr><td>MW117</td><td>874.01</td><td>2.81</td><td>871.20</td></tr>
</table>

A contour plot was prepared for the groundwater levels as shown on Figure 5. Groundwater flow generally occurs in a down gradient direction perpendicular to the groundwater elevation contours. The contour plot indicates that groundwater generally flows towards the north-east. This was consistent with expectations based on the topography and the location of the Belubula River, and was also consistent with the groundwater flow direction modelled in the PSI.</td></tr>
<tr><td>Groundwater Field Parameters</td><td>Field measurements recorded during sampling were as follows:
- pH ranged from 5.57 to 6.85;
- EC ranged from 171.5µS/cm to 1,380µS/cm;
- Eh ranged from 124.2mV to 185.2mV; and
- DO ranged from 1.7mg/L to 5.4mg/L.

The PID readings in the monitoring well headspace recorded during sampling ranged from 0.2ppm in MW12 to 1.4ppm in MW116.</td></tr>
<tr><td>LNAPLs petroleum hydrocarbons</td><td>Phase separated product (i.e. LNAPL) was not detected using the interphase probe during groundwater sampling.</td></tr>
</table>

7.4 GPR Scan

The GPR scan of the area in the vicinity of the redundant UST identified one suspected UST with an approximate capacity of ~2,000L. The approximate location is shown on Figure 2 in the appendices. The UST was identified in the grass verge between the existing maintenance building and the south-east car park as previously indicated. Due to a technical error recording the datafile, a copy of the GPR output was not able to be provided by the services locator.

7.5 Soil Laboratory Results

The soil laboratory results were assessed against the SAC presented in Section 6.1. Individual SAC are shown in the report tables attached in the appendices. It is noted that the tables in Appendix B include the PSI data for completeness. However, the PSI data is not summarised below. A summary of the results is presented below:

7.5.1 Human Health and Environmental (Ecological) Assessment

Table 7-3: Summary of Soil Laboratory Results – Human Health and Environmental (Ecological)

Analyte	N	Max. (mg/kg)	N> Human Health SAC	N> Ecological SAC	Comments
Arsenic	39	120	1	1	The arsenic concentration of 120mg/kg reported in BH113 (0-0.1m) marginally exceeded the human health SAC of 100mg/kg. The concentration also exceeded the ecological SAC.
Cadmium	38	0.5	0	NSL	-
Chromium Total* Hexavalent	 38 3	 280 120	 2 1	 0 0	The chromium (total) concentrations of between 120mg/kg and 280mg/kg reported in two primary samples from BH116 (0.015-0.45m) BH117 (0.01-0.4m), and the field duplicate SDUP101, exceeded the adopted human health SAC of 100mg/kg. It is noted however that the SAC is based on hexavalent chromium, not total chromium. Hexavalent chromium analysis was undertaken on the primary samples BH116 (0.015-0.45m) and BH117 (0.01-0.4m) where the total chromium concentrations exceeded 100mg/kg. The hexavalent chromium concentration of 120mg/kg reported in BH116 (0.015-0.45m) exceeded the human health SAC of 100mg/kg. The hexavalent chromium concentration in BH117 (0.01-0.4m) was 2mg/kg and was below the SAC.
Copper	38	200	0	0	-
Lead	38	64	0	0	-
Mercury	38	0.5	0	NSL	-
Nickel	38	130	0	0	-
Zinc	38	100	0	0	-

Analyte	N	Max. (mg/kg)	N> Human Health SAC	N> Ecological SAC	Comments
Total PAHs	38	1.8	0	NSL	-
Benzo(a)pyrene	38	0.2	NSL	0	-
Carcinogenic PAHs (as BaP TEQ)	38	<0.5	0	NSL	-
Naphthalene	38	<1	0	NSL	-
DDT+DDE+DDD	26	0.3	0	NSL	-
DDT	26	<0.1	NSL	0	-
Aldrin and dieldrin	26	<0.1	0	NSL	-
Chlordane	26	<0.1	0	NSL	-
Heptachlor	26	<0.1	0	NSL	-
Chlorpyrifos (OPP)	26	<0.1	0	NSL	-
PCBs	26	<0.1	0	NSL	-
TRH F1	38	<25	0	0	-
TRH F2	38	<50	0	0	-
TRH F3	38	340	0	0	-
TRH F4	38	120	0	0	-
Benzene	38	<0.2	0	0	-
Toluene	38	<0.5	0	0	-
Ethylbenzene	38	<1	0	0	-
Xylenes	38	<1	0	0	-
Asbestos (in soil) (%w/w)	24	<0.01 ACM <0.001 AF/FA	0	NA	Asbestos was not detected in any of the soil samples analysed during the DSI.

Notes:

N: Total number (primary samples)

NSL: No set limit

NL: Not limiting

*As there is no HIL SAC for Chromium (total), the SAC for Chromium (VI) has been adopted

7.5.2 Waste Classification Assessment

The laboratory results were assessed against the criteria presented in Section 6. The results are presented in the report tables attached in the appendices. It is noted that the tables in Appendix B include the PSI data for completeness. However, the PSI data is not summarised below. A summary of the results is presented in the following table:

Table 7-4: Summary of Soil Laboratory Results Compared to CT and SCC Criteria

Analyte	N	N > CT Criteria	N > SCC Criteria	Comments
Arsenic	39	1	0	The arsenic concentration in the fill sample from BH113 (0-0.1m) exceeded the CT1 criterion. The arsenic concentration was 120mg/kg.
Cadmium	38	0	0	-
Chromium (total)	38	2	0	Chromium concentrations exceeded the CT1 criterion in two primary fill samples collected from BH116 (0.015-0.45m) and BH117 (0.01-0.4m), and the field duplicate SDUP101. The maximum chromium concentration was 280mg/kg.
Copper	38	NSL	NSL	-
Lead	38	0	0	-
Mercury	38	0	0	-
Nickel	38	4	0	Nickel concentrations exceeded the CT1 criterion in four primary samples collected from BH112 (0-0.2m), BH112 (0.4-0.6m), BH116 (0.015-0.45m) and BH117 (0.01-0.4m), and field duplicate SDUP101. The maximum nickel concentration was 130mg/kg.
Zinc	38	NSL	NSL	-
TRH (C_6-C_9)	38	0	0	-
TRH (C_{10}-C_{36})	38	0	0	-
BTEX	38	0	0	-
Total PAHs	38	0	0	-
Benzo(a)pyrene	38	0	0	-
OCPs & OPPs	26	0	0	-
PCBs	26	0	0	-
Asbestos	24	-	-	Asbestos was not detected in any of the samples analysed during the DSI.

N: Total number (primary samples)

NSL: No set limit

Table 7-5: Summary of Soil Laboratory Results Compared to TCLP Criteria

Analyte	N	N > TCLP Criteria	Comments
Arsenic	1	0	-
Chromium	3	0	-
Nickel	5	0	-

N: Total number (primary samples)

7.5.3 Statistical Analysis

As the sampling plan was non-probabilistic, statistical analysis did not form part of the DQOs as set out in the SAQP. However, we have undertaken 95% upper confidence limit (UCL) calculations using the available arsenic, chromium, lead and nickel data, and have undertaken combined risk value (CRV) calculations on the arsenic and chromium from the fill soils during the PSI and DSI. The statistical analysis is preliminary and has been used as a line of evidence in assessing risks as part of the Tier 1 risk assessment process for arsenic and chromium. The UCLs for arsenic, chromium and nickel have been considered in the context of the preliminary waste classification assessment as these metals were encountered at concentrations that exceeded the CT1 criteria.

A summary of these calculations is presented below:

7.5.3.1 UCL calculations

Statistical calculations undertaken on the results using ProUCL (Version 5.1) are shown on Tables S1 and S7 attached in the appendices. In summary:

Table 7-6: Summary of 95% UCL calculations

Analyte	N ^	Standard Deviation (mg/kg)	95% UCL (mg/kg)	Comment
Arsenic	37	25.01	32.09	Both the UCL and the standard deviation were less than 50% of the HIL-A SAC. The UCL was less than the CT1 criterion.
Chromium (total or hexavalent)*	36	69.38	68.39	The UCL was less than the HIL-A SAC. The standard deviation was greater than 50% of the HIL-A SAC. Three of the results were greater than 250% of the SAC (these concentrations were all from total chromium).
Chromium (total only)**	36	84.46	122.5	The UCL was greater than the CT1 criterion and less than the SCC1 criterion.
Lead	36	43.37	40.97	The UCL was less than the CT1 criterion.

Analyte	N ^	Standard Deviation (mg/kg)	95% UCL (mg/kg)	Comment
Nickel	36	64.41	77.68	The UCL was less than the CT1 criterion.

Notes:

N^: Total number of samples, using the sample with the highest concentration where duplicates exist

*: Hexavalent chromium concentration used where available

**: Only total chromium values used

7.5.3.2 Combined Risk Value Method (CRV)

CRV calculations were undertaken for the arsenic and chromium in soil data with reference to Section 7.2 of the NSW EPA Sampling Design Part 1 – Application (2022)[15], Contaminated Land Guidelines. The CRV method is used to assess the minimum number of samples required to have an acceptable level of certainty around making Type I or Type II decision errors in determining whether or not a site is or is not contaminated (i.e. whether the power of the statistical tests is sufficient). As the sampling plan was non-probabilistic and there are data gaps associated with the existing buildings/structures etc, these statistical tests are preliminary in nature and have been used as a line of evidence in the Tier 1 risk assessment, rather than in the assessment of decision errors.

The number of samples (n) required for arsenic and chromium, calculated using the CRV method, were 2 and 12 samples respectively. As the number of samples (n) is less than the number of samples analysed, this suggests (also considering the associated UCLs) that the site is not contaminated with arsenic and chromium to the extent that there would be an unacceptable risk to human receptors. This is discussed further in the Tier 1 risk assessment.

7.6 Soil Vapour Assessment

The soil vapour laboratory results were assessed against the action criteria adopted for the investigation. The results are presented in the attached report tables and summarised in the following table:

Table 7-7: Summary of Soil Vapour Laboratory Results – Human Health

Analyte	N ^	Max. (µg/m^3)	N> Human Health SAC	Comments
TRH F1	2	<200	0	-
TRH F2*	2	210	0	-
Benzene	2	190	0	-
Toluene	2	100	0	-
Ethylbenzene	2	10	0	-
Total Xylenes	2	60	0	-

[15] NSW EPA, (2022). *Sampling design part 1 - application.* (referred to as EPA Sampling Design Guidelines 2022)

Analyte	N ^	Max. (µg/m³)	N> Human Health SAC	Comments
Naphthalene	2	<2.6	0	-
VOC Propylene Chloromethane 1,3-butadiene Ethanol Trichlorofluoromethane Acetone isopropyl alcohol carbon disulfide methyl ethyl ketone (MEK) hexane chloroform cyclohexane heptane bromodichloromethane styrene 4-ethyl toluene 1,3,5 Trimethylbenzene 1,2,4-Trimethylbenzene 1,4-Dichlorobenzene	2	 350 8 91 40 10 150 10 20 23 25 250 2 20 30 5 5 7 20 10	2	All chlorinated solvent concentrations with NEPM (2013) interim HIL-A SAC were reported below the detection limits and less than the SAC. Traces of propylene, chloromethane, 1,3-butadiene, ethanol, trichlorofluoromethane, (freon 11), acetone, isopropyl alcohol, carbon disulfide, methyl ethyl ketone (MEK), hexane, chloroform, cyclohexane, heptane, bromodichloromethane, styrene, 4-ethyl toluene, 1,3,5-Trimethylbenzene, 1,2,4-Trimethylbenzene, 1,4-Dichlorobenzene were detected in the samples. Concentrations of bromodichloromethane, 1,3-butadiene and chloroform were detected in the samples at concentrations that were above the USEPA SAC.

Notes:

N^: Number of Primary samples

*TRH F2 is TRH C_{10}-C_{12} only

7.7 Groundwater Laboratory Results

The groundwater laboratory results were assessed against the SAC presented in Section 6.3. Individual SAC are shown in the report tables attached in the appendices. It is noted that the tables in Appendix B include the PSI data for completeness. However, the PSI data is not summarised below. A summary of the results is presented below:

Table 7-8: Summary of Groundwater Laboratory Results – Human Health and Environmental (Ecological)

Analyte	N ^	Max. (µg/L)	N> Human Health SAC	N> Ecological SAC	Comments
Arsenic	6	1	0	0	-
Cadmium	6	<0.1	0	0	-
Chromium (total)	6	4	0	2	The chromium concentrations reported in the primary sample MW116 and its field duplicate sample WDUP2 of 4µg/L, marginally exceeded the freshwater ecological SAC of 3.3µg/L.
Copper	6	1	0	0	-
Lead	6	<1	0	0	-

Analyte	N ^	Max. (µg/L)	N> Human Health SAC	N> Ecological SAC	Comments
Mercury	6	<0.05	0	0	-
Nickel	6	3	0	0	-
Zinc	6	27	0	3	The zinc concentrations reported in samples from MW101, MW116 and its field duplicate WDUP2, and MW117 and its field duplicate WDUP1 of between 18µg/L and 27µg/L, exceeded the freshwater ecological SAC of 8µg/L. The highest concentration of zinc was detected in MW116.
Total PAHs	6	<0.1/<0.2	0	0	-
Benzo(a)pyrene	6	<0.1	0	0	-
Naphthalene	6	<0.2	0	0	-
TRH F1	6	<10	0	NSL	-
TRH F2	6	54	0	NSL	A detectable concentration of TRH F2 (below the SAC) was reported in the sample from MW116.
TRH F3	6	270	NSL	NSL	Detectable concentrations of TRH F3 were reported in MW116 and its field duplicate WDUP2. It is noted that there are no SAC for TRH F3.
TRH F4	6	<100	NSL	NSL	-
Benzene	6	<1	0	0	-
Toluene	6	1	0	0	A trace concentration of toluene (below the SAC) was reported in the sample from MW12.
Ethylbenzene	6	<1	0	0	-
m+p-Xylene	6	<2	0	0	-
o-Xylene	6	<1	0	0	-
Total Xylenes	6	<2	0	0	-
VOCs	6	<1/<10	0	0	-
pH	6	7.1	3	3	The pH of MW15, MW116 and MW117 was outside the health based range and the ecological range of 6.5 to 8.5.

Analyte	N ^	Max. (µg/L)	N> Human Health SAC	N> Ecological SAC	Comments
EC	6	1,900	NSL	NSL	-

Notes:

^: Primary samples

N: Total number

NSL: No set limit

NL: Not limiting

8 WASTE CLASSIFICATION ASSESSMENT

Table 8-1: Summary of Preliminary Waste Classifications

Site Area	Preliminary Waste Classification	Recommendation / Comment
Fill material - Vicinity of BH3	General Solid Waste (non-putrescible) containing Special Waste (asbestos).	Given the AF/FA findings in fill in the vicinity of BH3 during the PSI, additional sampling and analysis must be undertaken to confirm the extent of this waste stream and classification prior to off-site disposal.
Fill material - Redundant UST pit spoil	To be confirmed	Due to the proximity of live services, sampling was not undertaken in the UST pit. The classification of any waste soil/water from the UST pit must be confirmed once the waste quantities are known, and prior to any off-site disposal of the waste.
Fill material - Remainder of site	General Solid Waste (non-putrescible).	This waste classification must be confirmed once the waste quantities are known, and prior to any off-site disposal of the waste and the findings of the DSI must be considered in finalising the documentation.
Natural soil – Site wide	Virgin excavated natural material (VENM) and/or General Solid Waste (non-putrescible).	Based on the scope of work undertaken for this assessment, and at the time of reporting, JKE is of the opinion that the natural soil and bedrock at the site would likely meet the definition of **VENM** for off-site disposal or re-use purposes. VENM is considered suitable for re-use on-site (from a contamination viewpoint), or alternatively, the information included in this report may be used to assess whether the material is suitable for beneficial reuse at another site as fill material. It is possible that some natural soils may be impacted by hydrocarbons in the vicinity of the UST and this will require further consideration in confirming the waste classification(s). In accordance with Part 1 of the Waste Classification Guidelines, VENM is pre-classified as general solid waste and can also be disposed of accordingly to a facility that is licensed to accept it.
Bedrock – Site wide	To be confirmed	A medium risk of naturally occurring asbestos is mapped within 300m of the site. Sampling/analysis of bedrock for asbestos did not occur during the PSI or DSI as bedrock was not encountered to the maximum borehole depth of 7.45m. Sampling and analysis of any bedrock waste generated during the development must be undertaken to confirm the waste classification of this material prior to off-site disposal.

9 DISCUSSION

9.1 Tier 1 Risk Assessment and Review of CSM

For a contaminant to represent a risk to a receptor, the following three conditions must be present:

1. Source – The presence of a contaminant;
2. Pathway – A mechanism or action by which a receptor can become exposed to the contaminant; and
3. Receptor – The human or ecological entity which may be adversely impacted following exposure to contamination.

If one of the above components is missing, the potential for adverse risks is relatively low.

9.1.1 Soil

9.1.1.1 Human Health Risk

Arsenic was detected in fill soil at a concentration above the health-based SAC in one location (refer to Figure 4). Chromium (as total chromium) was detected in fill soils above the adopted health based SAC in three locations. We note that the chromium SAC is based on hexavalent chromium, and therefore additional analysis of hexavalent chromium was run on selected samples. Hexavalent chromium was detected in one of these samples above the health based SAC (refer to Figure 4), indicating the chromium at the other locations is likely to be largely associated with chromium III and risks from chromium at these locations are likely to be negligible. Statical calculations were run on the entire dataset for both arsenic and chromium from the fill soils during the PSI and DSI. The 95% UCL for both arsenic and chromium were below the SAC.

From a risk perspective, the generic HILs in NEPM 2013 do not perfectly capture the existing/proposed land use scenario which includes a hospital with children present. On this basis, JKE has used more conservative criteria for the purpose of the investigations. The adopted HIL-A criteria are for a residential with accessible soils-type exposure scenario to assess exposure to both adults and children predominantly via the ingestion and dermal pathways. These criteria were considered applicable for initial screening purposes as the HIL-D criteria for commercial/industrial use do not consider children, so it could be argued that adopting the HIL-D criteria would not be suitably protective of the most sensitive receptors identified at this site.

However, except for the day-care centre area, the HIL-A criteria may be overly conservative for a hospital scenario where land users are predominantly indoors and there is little time spent outdoors in unpaved/landscaped zones. Therefore, in our opinion, the HIL-C land use scenario for parks and recreational open spaces are considered more suitable Tier 1 risk based criteria for the hospital in general (excluding the day-care centre) and we note that the HIL-C SAC for arsenic and hexavalent chromium are both 300mg/kg and all reported soil concentrations were below these criteria.

Based on the above, and considering multiple lines of evidence, potential risks associated with heavy metals (arsenic and chromium) in fill soils are considered to be low in the context of the current and ongoing land use as a hospital. However, data gaps exist as sampling has not occurred beneath the buildings. We consider that a site specific human health risk assessment (HHRA) should be undertaken to confirm the assessment of risk.

9.1.1.2 Ecological Risk

Arsenic was encountered above the ecological SAC in one location during the DSI and the exceedance was only marginally above the SAC. The source of the arsenic impact is considered likely to be associated with the imported fill. The exceedance was considered to be minor and elevated arsenic was not detected in any other samples. Considering the overall dataset, including the UCL for arsenic, we consider that the minor exceedance of the ecological SAC does not pose an unacceptable ecological risk.

9.1.1.3 Other CoPC

FCF/ACM was not encountered in the fill material at the site during the DSI field work. No asbestos was detected in any of the soil samples analysed for the DSI. However, we note that sampling was not undertaken beneath existing buildings and structures due to access limitations. Further investigation will be required to assess the potential impact of asbestos in/on fill at the site following demolition of the existing buildings/structures and for waste classification purposes. This can be addressed via provisions in the RAP.

Due to live services proximity to the redundant UST, sampling in the UST pit was not undertaken. Further localised assessment of residual contamination associated with the UST is considered to be required. This can be addressed via provisions in the RAP.

Elevated concentrations of the remaining CoPC were below the adopted SAC in the soil samples analysed during the investigation. Although below the human health and ecological SAC, it is noted that pesticides were detected in fill at BH109.

9.1.1.4 Consideration of PSI Soil Data

Concentrations of chromium (as total chromium) that exceeded the health-based SAC were identified in two locations and asbestos as AF/FA was detected in fill/soil at a concentration above the SAC in one location (refer to Figure 4). As a duty of care, and to meet the requirements under Clause 429 of the Work Health and Safety Regulation (2017), an Asbestos Management Plan (AMP) (for asbestos in/on soil) should be prepared and implemented to manage the site until development occurs.

Exceedances of the CoPC identified during the PSI and DSI are presented on Figure 4 and discussed in the PSI report.

9.1.2 Soil Vapour

All TRH/BTEX and naphthalene results were below the SAC. Concentrations of bromodichloromethane, 1,3-butadiene and chloroform were detected in the samples at concentrations that were above the SAC which were based on residential sub-slab concentrations from USEPA guidance. We consider it unlikely that the reported concentrations pose an unacceptable risk, however, further assessment is required. The presence of these compounds may be attributed to the UST and also leaking potable water infrastructure containing trihalomethanes.

In our opinion, the reported soil vapour concentrations indicated that there is a low potential for unacceptable soil vapour risks that would warrant remediation. Additional soil vapour sampling and a HHRA will be required to confirm this.

9.1.3 Groundwater

The groundwater samples encountered concentrations of zinc and chromium in groundwater above the ecological SAC (refer to Figure 4). The zinc exceedances were generally consistent across the monitoring well network and are considered to be associated with regional factors.

The chromium concentration in MW116 may be attributed to the occurrence of elevated chromium in fill at this location. However, we note that the exceedance of the ecological SAC is very minor (i.e. the MW116 chromium concentration was 4µg/L and the SAC for chromium is 3.3µg/L) and there are no nearby receiving waterbodies which could be easily impacted. The SAC for freshwater ecological SAC for hexavalent chromium is slightly lower at 1µg/L and hexavalent chromium analysis did not occur on groundwater samples. Nevertheless, there is not considered to be a valid and complete SPR-linkage due to the distance of nearby water bodies and ecological risks from chromium are considered to be low and acceptable.

The ADWG 2011 SAC for hexavalent chromium is 50µg/L and all reported concentrations of chromium in groundwater were well below this concentration.

The pH of the groundwater from MW115, MW116 and MW117 was outside the range generally accepted for both human health and ecological receptors.

Where temporary construction dewatering is required, it is expected that the management of such water would occur in accordance with the regulatory requirements so that no unacceptable construction-phase risks occur.

9.1.3.1 Other CoPC in Groundwater

Elevated concentrations of the other CoPC were not encountered above the adopted SAC in the groundwater samples analysed and therefore are not considered to pose a risk to the receptors at the concentrations reported to date.

Given the indicated groundwater flow direction to the north-east and the position of the former off-site UST, the occurrence of detectable concentrations of toluene in MW12 is considered likely to be associated with the former off-site UST that was located on the adjacent NSW Ambulance Station property (refer to Figure 2). The concentrations were low and do not pose an unacceptable risk.

Given the indicated groundwater flow direction and the position of the redundant onsite UST relative to MW116, the detectable concentrations of TRH F2 and TRH F3 in MW116 are likely associated with this AEC (i.e. the onsite UST). This is further supported by the lack of detectable TRH in MW117. The concentrations were low and do not pose an unacceptable risk.

9.1.3.2 Consideration of PSI Groundwater Data

Consideration and review of the entire dataset (including the PSI groundwater data) has been undertaken and the PSI groundwater results are presented in the tables attached in Appendix C. TRH F2 was detected in MW1 above the SSA-criterion of 100µg/L (refer to Figure 4).

The SWL recorded during the PSI in MW1 was 4.38mBGL, and it is noted that MW1 was dry (i.e. SWL >6mBGL), during the fieldwork undertaken for the DSI. The SAC for TRH F2 in groundwater when the groundwater is 4-8mBGL is 1,000µg/L and the reported concentrations were well below this level. It is also noted that TRH/BTEX concentrations in the soil vapour samples were negligible. Based on these factors, vapour intrusion risks from contaminated groundwater where the proposed development is close to the existing grade are considered to be low and acceptable.

It is noted that heavy metals concentrations were generally similar between the PSI and DSI sampling events.

9.2 Decision Statements

The decision statements are addressed below:

Are any results above the SAC?

Yes.

Do potential risks associated with contamination exist, and if so, what are they?

Yes, there are potential health-based risks associated with asbestos (identified during the PSI), arsenic and chromium in fill soil. Based on the current data, the risks associated with the heavy metals in fill soils are likely to be low, however further risk assessment is required. Ecological risks from fill soil were assessed to be low and acceptable.

JKE is of the opinion that potential risks associated with groundwater at the site are low in the context of the proposed development and are not indicative of site contamination. Risks associated with soil vapour were also assessed to be low, however, further sampling and risk assessment is required to confirm this.

Is further investigation/remediation required?

Remediation of the site will be required. Additional investigation and risk assessment are also required. However, we consider that it would be reasonable to include the requirements for further investigation within the Remediation Action Plan (RAP) because a large portion of this work will need to occur after demolition. Additional details of the proposed development will also be required to carry out the risk assessment (e.g. details of buildings being retained or demolished, proposed building footprints and finished floor levels, earthworks levels, locations of car parks and landscaped areas etc).

We anticipate that as a minimum remediation will address the occurrence of asbestos in fill and potential impacts in the vicinity of the UST. It is expected that remediation will include the removal/off-site disposal of fill where practicable. Long-term management of contamination may be necessary in the event that contamination remains on site. In our opinion the scope of remediation will not need to extend to groundwater in the context of rendering the site suitable for the proposed development.

What is the waste classification of the fill material and natural soils sampled, and is further sampling analysis required to confirm the waste classification(s)?

Refer to Section 8.

Is the site suitable for the proposed development, or can the site be made suitable subject to further characterisation and/or remediation?

JKE is of the opinion that the site can be made suitable for the proposed development outlined in Section 1.1 via remediation.

9.3 Review of CSM and Data Gaps

A review of the CSM and an assessment of data gaps is provided in the following table:

Table 9-1: Review of CSM and Data Gap Assessment

Source/AEC	Review of CSM and Data Gap Assessment
Fill material	Fill ranging in depth between approximately 0.1m to 1.2mBGL was encountered across the site. The fill contained anthropogenic inclusions such as ceramic and brick fragments, sand, ash, slag. Due to the access constraints, probabilistic/grid-based sampling was not practicable on this site. It is also noted that sampling occurred from boreholes which poses limitation for identifying asbestos in fill, and sampling was not undertaken beneath the buildings/structures. Further investigation of the fill will be required following demolition of the buildings/structures and when access becomes available to assess the full extent of risks associated with this AEC. However, in our opinion, we consider it is likely that the fill conditions beneath the buildings will be consistent with those encountered in the PSI/DSI boreholes. It is recommended that additional sampling is undertaken via test pits if practicable. In our opinion, this work can be incorporated into the requirements under the RAP and this data gap does not alter our recommendations.
Fuel Storage	Sampling was not undertaken in the tank pit area (i.e. within the lank pit backfill) of the redundant UST due in part to access limitations associated with underground services. Residual contamination may be localised to the tank pit soils/waters and any soils/waters around underground pipework or associated infrastructure. Further localised assessment of any residual localised contamination associated with the UST and infrastructure is considered to be required to assess the full extent of risks associated with this AEC and inform the waste classification. In our opinion, this work can be incorporated into the requirements under the RAP and this data gap does not alter our recommendations.
Use of Pesticides	Sampling beneath the building/structure footprint and/or in close proximity to the building/structure was not undertaken due in part to the preliminary nature of the investigation.

Source/AEC	Review of CSM and Data Gap Assessment
	Further investigation of the fill/soils beneath the buildings/structures will be required to assess the full extent of risks associated with this AEC. In our opinion, this work can be incorporated into the requirements under the RAP and this data gap does not alter our recommendations.
Hazardous Building Materials	Previous identification of asbestos (as AF/FA) in fill soils in the vicinity of BH3 and inclusions in fill soils in other areas of the site were indicative of former demolition / construction activities (i.e. glass). The buildings and structures on the site are of an age indicative of housing hazardous building materials (i.e. asbestos fibre cement and lead paint). JKE is not aware of a hazardous building materials register for the site. Further investigation of the fill will be required to assess the full extent of contamination risks on site as noted above.
Off-site areas	Based on the reported results to date, and at the time of reporting, risks associated with this AEC are considered to be low and do not require further assessment.

10 CONCLUSIONS AND RECOMMENDATIONS

The DSI included a review of existing project information, a site inspection, soil sampling from 23 boreholes, soil vapour sampling from two vapour implants and groundwater sampling from six monitoring wells (three new and three existing). The following potential contamination sources were identified at the site: fill material; fuel storage onsite (redundant UST and AST); use of pesticides; hazardous building materials (former and existing buildings and structures); naturally occurring asbestos; and off-site land uses (upgradient ambulance station former UST and motor mechanic).

The boreholes encountered fill materials to depths of approximately 0.1mBGL to 1.4mBGL, underlain by silty or clayey residual soils. The fill contained inclusions of ironstone, igneous and sandstone gravel, sand, glass, slag, ash, mulch and root fibres. There was no FCF/ACM identified in any of the bulk asbestos quantification field screening samples.

Potential health-based risks associated with asbestos (identified during the PSI), arsenic and chromium in fill soil. Based on the current data, the risks associated with the heavy metals in fill soils are likely to be low, however further risk assessment is required. Ecological risks from fill soil were assessed to be low and acceptable.

JKE is of the opinion that potential risks associated with groundwater at the site are low in the context of the proposed development and are not indicative of site contamination that warrants remediation. Risks associated with soil vapour were also assessed to be low, however, further sampling and risk assessment is required to confirm this.

Remediation of the site will be required. Additional investigation and risk assessment are also required. However, we consider that it would be reasonable to include the requirements for further investigation within the Remediation Action Plan (RAP) because a large portion of this work will need to occur after demolition. Additional details of the proposed development will also be required to carry out the risk assessment (e.g. details of buildings being retained or demolished, proposed building footprints and finished floor levels, earthworks levels, locations of car parks and landscaped areas etc).

We anticipate that as a minimum remediation will address the occurrence of asbestos in fill in BH3 and potential impacts in the vicinity of the UST. It is expected that remediation will include the removal/off-site disposal of fill where practicable. Long-term management of contamination may be necessary in the event that contamination remains on site. In our opinion the scope of remediation will not need to extend to groundwater in the context of rendering the site suitable for the proposed development.

We are of the opinion that the site can be made suitable for the proposed hospital development via remediation.

We recommend the following:

1. Prepare an AMP to manage asbestos in soil risks in the context of the on-going use of the site as a hospital. This AMP will need to remain in force until the redevelopment occurs;
2. Prior to preparation of the RAP, a preliminary site-specific HHRA is to be undertaken by a specialist consultant;

3. Preparation and implementation of a RAP. In addition to the remediation and validation of fill and the UST area, the RAP is to include requirements for a post-demolition investigation(s) to adequately address the data gaps discussed in Section 9.3 of this report;
4. Following the additional investigation(s), the HHRA is to be updated and finalised. Should the final HHRA alter the strategies or the extent of remediation defined in the RAP, an addendum RAP must be prepared and implemented; and
5. Preparation of a validation assessment report for the remediation works undertaken at the site.

If not already undertaken, a Hazardous Building Materials Assessment (HAZMAT) must be undertaken for the existing buildings/structures at the site prior to the commencement of demolition work.

JKE consider that the report objectives outlined in Section 1.2 have been addressed.

11 LIMITATIONS

The report limitations are outlined below:

- JKE accepts no responsibility for any unidentified contamination issues at the site. Any unexpected problems/subsurface features that may be encountered during development works should be inspected by an environmental consultant as soon as possible;
- Previous use of this site may have involved excavation for the foundations of buildings, services, and similar facilities. In addition, unrecorded excavation and burial of material may have occurred on the site. Backfilling of excavations could have been undertaken with potentially contaminated material that may be discovered in discrete, isolated locations across the site during construction work;
- This report has been prepared based on site conditions which existed at the time of the investigation; scope of work and limitation outlined in the JKE proposal; and terms of contract between JKE and the client (as applicable);
- The conclusions presented in this report are based on investigation of conditions at specific locations, chosen to be as representative as possible under the given circumstances, visual observations of the site and immediate surrounds and documents reviewed as described in the report;
- Subsurface soil and rock conditions encountered between investigation locations may be found to be different from those expected. Groundwater conditions may also vary, especially after climatic changes;
- The investigation and preparation of this report have been undertaken in accordance with accepted practice for environmental consultants, with reference to applicable environmental regulatory authority and industry standards, guidelines and the assessment criteria outlined in the report;
- Where information has been provided by third parties, JKE has not undertaken any verification process, except where specifically stated in the report;
- JKE has not undertaken any assessment of off-site areas that may be potential contamination sources or may have been impacted by site contamination, except where specifically stated in the report;
- JKE accept no responsibility for potentially asbestos containing materials that may exist at the site. These materials may be associated with demolition of pre-1990 constructed buildings or fill material at the site;
- JKE have not and will not make any determination regarding finances associated with the site;
- Additional investigation work may be required in the event of changes to the proposed development or landuse. JKE should be contacted immediately in such circumstances;
- Material considered to be suitable from a geotechnical point of view may be unsatisfactory from a soil contamination viewpoint, and vice versa; and
- This report has been prepared for the particular project described and no responsibility is accepted for the use of any part of this report in any other context or for any other purpose.

Important Information About This Report

These notes have been prepared by JKE to assist with the assessment and interpretation of this report.

The Report is based on a Unique Set of Project Specific Factors
This report has been prepared in response to specific project requirements as stated in the JKE proposal document which may have been limited by instructions from the client. This report should be reviewed, and if necessary, revised if any of the following occur:

- The proposed land use is altered;
- The defined subject site is increased or sub-divided;
- The proposed development details including size, configuration, location, orientation of the structures or landscaped areas are modified;
- The proposed development levels are altered, eg addition of basement levels; or
- Ownership of the site changes.

JKE will not accept any responsibility whatsoever for situations where one or more of the above factors have changed since completion of the investigation. If the subject site is sold, ownership of the investigation report should be transferred by JKE to the new site owners who will be informed of the conditions and limitations under which the investigation was undertaken. No person should apply an investigation for any purpose other than that originally intended without first conferring with the consultant.

Changes in Subsurface Conditions
Subsurface conditions are influenced by natural geological and hydrogeological process and human activities. Groundwater conditions are likely to vary over time with changes in climatic conditions and human activities within the catchment (e.g. water extraction for irrigation or industrial uses, subsurface waste water disposal, construction related dewatering). Soil and groundwater contaminant concentrations may also vary over time through contaminant migration, natural attenuation of organic contaminants, ongoing contaminating activities and placement or removal of fill material. The conclusions of an investigation report may have been affected by the above factors if a significant period of time has elapsed prior to commencement of the proposed development.

This Report is based on Professional Interpretations of Factual Data
Site investigations identify actual subsurface conditions at the actual sampling locations at the time of the investigation. Data obtained from the sampling and subsequent laboratory analyses, available site history information and published regional information is interpreted by geologists, engineers or environmental scientists and opinions are drawn about the overall subsurface conditions, the nature and extent of contamination, the likely impact on the proposed development and appropriate remediation measures.

Actual conditions may differ from those inferred, because no professional, no matter how qualified, and no subsurface exploration program, no matter how comprehensive, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than an investigation indicates. Actual conditions in areas not sampled may differ from predictions. Nothing can be done to prevent the unanticipated, but steps can be taken to help minimise the impact. For this reason, site owners should retain the services of their consultants throughout the development stage of the project, to identify variances, conduct additional tests which may be needed, and to recommend solutions to problems encountered on site.

Investigation Limitations
Although information provided by a site investigation can reduce exposure to the risk of the presence of contamination, no environmental site investigation can eliminate the risk. Even a rigorous professional investigation may not detect all contamination on a site. Contaminants may be present in areas that were not surveyed or sampled, or may migrate to areas which showed no signs of contamination when sampled. Contaminant analysis cannot possibly cover every type of contaminant which may occur; only the most likely contaminants are screened.

Misinterpretation of Site Investigations by Design Professionals

Costly problems can occur when other design professionals develop plans based on misinterpretation of an investigation report. To minimise problems associated with misinterpretations, the environmental consultant should be retained to work with appropriate professionals to explain relevant findings and to review the adequacy of plans and specifications relevant to contamination issues.

Logs Should not be Separated from the Investigation Report

Borehole and test pit logs are prepared by environmental scientists, engineers or geologists based upon interpretation of field conditions and laboratory evaluation of field samples. Logs are normally provided in our reports and these should not be re-drawn for inclusion in site remediation or other design drawings, as subtle but significant drafting errors or omissions may occur in the transfer process. Photographic reproduction can eliminate this problem, however contractors can still misinterpret the logs during bid preparation if separated from the text of the investigation. If this occurs, delays, disputes and unanticipated costs may result. In all cases it is necessary to refer to the rest of the report to obtain a proper understanding of the investigation. Please note that logs with the 'Environmental Log' header are not suitable for geotechnical purposes as they have not been peer reviewed by a Senior Geotechnical Engineer.

To reduce the likelihood of borehole and test pit log misinterpretation, the complete investigation should be available to persons or organisations involved in the project, such as contractors, for their use. Denial of such access and disclaiming responsibility for the accuracy of subsurface information does not insulate an owner from the attendant liability. It is critical that the site owner provides all available site information to persons and organisations such as contractors.

Read Responsibility Clauses Closely

Because an environmental site investigation is based extensively on judgement and opinion, it is necessarily less exact than other disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, model clauses have been developed for use in written transmittals. These are definitive clauses designed to indicate consultant responsibility. Their use helps all parties involved recognise individual responsibilities and formulate appropriate action. Some of these definitive clauses are likely to appear in the environmental site investigation, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to any questions.

Appendix A: Report Figures

AERIAL IMAGE SOURCE: GOOGLE EARTH PRO

This plan should be read in conjunction with the Environmental report.

Title: **SITE LOCATION PLAN**

Location: BLAYNEY DISTRICT HOSPITAL, 3 OSMAN STREET, BLAYNEY, NSW

Project No: E35521PT

Figure No: 1

JKEnvironments

PLOT DATE: 21/06/2023 10:07:54 AM DWG FILE: K:\5C EIS JOBS\35000'S\E35521PT BLAYNEY\CAD\E35521PT.DWG

LEGEND

APPROXIMATE SITE BOUNDARY

AERIAL IMAGE SOURCE: GOOGLE EARTH PRO

0 8 16 24 32 40

SCALE 1:800 @A3 METRES

This plan should be read in conjunction with the Environmental report.

Title: **SITE FEATURES PLAN**

Location: BLAYNEY DISTRICT HOSPITAL, 3 OSMAN STREET, BLAYNEY, NSW

Project No: E35521PT

Figure No: 2

JKEnvironments

PLOT DATE: 21/06/2023 10:08:03 AM DWG FILE: K:\5C EIS JOBS\35000'S\E35521PT BLAYNEY\CAD\E35521PT.DWG

LEGEND

- - - -	APPROXIMATE SITE BOUNDARY
BH(Fill Depth)	BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m) (JKE, 2022)
BH/MW(Fill Depth)	BOREHOLE AND GROUNDWATER MONITORING WELL LOCATION, NUMBER AND DEPTH OF FILL (m) (JKE, 2022)
BH102	BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m)
BH/MW101	BOREHOLE AND GROUNDWATER MONITORING WELL LOCATION, NUMBER AND DEPTH OF FILL (m)
▲ SV1	SOIL VAPOUR IMPLANT AND DEPTH (m)

AERIAL IMAGE SOURCE: GOOGLE EARTH PRO

0 6 12 18 24 30

SCALE 1:600 @A3 METRES

This plan should be read in conjunction with the Environmental report.

Title: **SAMPLE LOCATION PLAN**

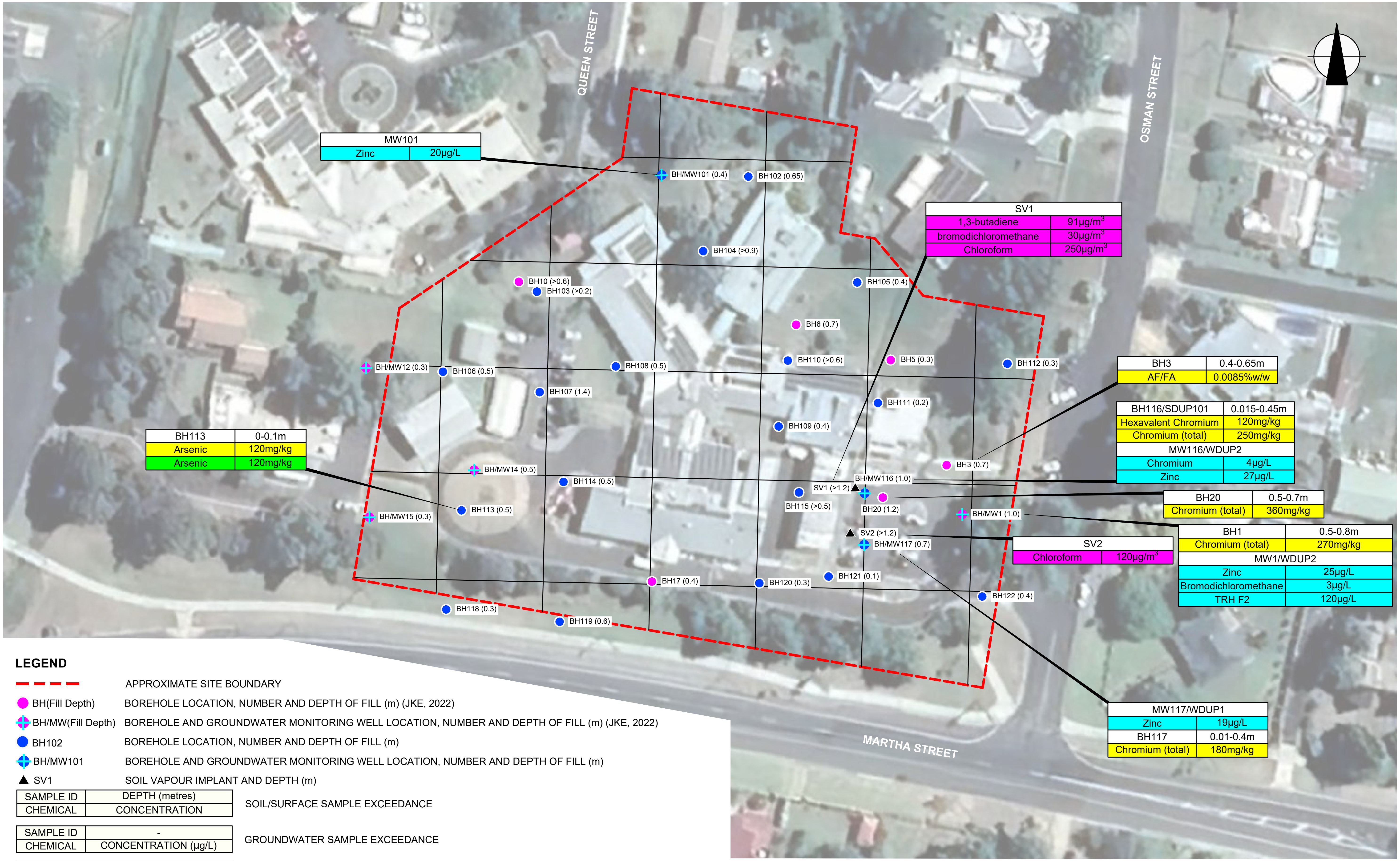
Location: BLAYNEY DISTRICT HOSPITAL, 3 OSMAN STREET, BLAYNEY, NSW

Project No: E35521PT

Figure No: 3

JKEnvironments

PLOT DATE: 23/06/2023 3:16:46 PM DWG FILE: K:\5C EIS JOBS\35000'S\E35521PT BLAYNEY\CAD\E35521PT.DWG



LEGEND

(red dashed line)	APPROXIMATE SITE BOUNDARY
BH(Fill Depth)	BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m) (JKE, 2022)
BH/MW(Fill Depth)	BOREHOLE AND GROUNDWATER MONITORING WELL LOCATION, NUMBER AND DEPTH OF FILL (m) (JKE, 2022)
BH102	BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m)
BH/MW101	BOREHOLE AND GROUNDWATER MONITORING WELL LOCATION, NUMBER AND DEPTH OF FILL (m)
SV1	SOIL VAPOUR IMPLANT AND DEPTH (m)
SAMPLE ID / DEPTH (metres); CHEMICAL / CONCENTRATION	SOIL/SURFACE SAMPLE EXCEEDANCE
SAMPLE ID / -; CHEMICAL / CONCENTRATION (µg/L)	GROUNDWATER SAMPLE EXCEEDANCE
SAMPLE ID / -; CHEMICAL / CONCENTRATION (µg/m³)	SOIL VAPOUR SAMPLE EXCEEDANCE
(yellow)	SOIL/SURFACE CONTAMINATION ABOVE SAC FOR HUMAN HEALTH RISK
(green)	SOIL/SURFACE CONTAMINATION ABOVE SAC FOR ECOLOGICAL RISK
(cyan)	GROUNDWATER CONTAMINATION ABOVE SAC
(magenta)	SOIL VAPOUR CONCENTRATION ABOVE SAC

AERIAL IMAGE SOURCE: GOOGLE EARTH PRO

0 8 16 24 32 40
SCALE 1:800 @A3 METRES

This plan should be read in conjunction with the Environmental report.

Title: **SAC EXCEEDANCE PLAN**

Location: BLAYNEY DISTRICT HOSPITAL, 3 OSMAN STREET, BLAYNEY, NSW

Project No: E35521PT

Figure No: 4

JKEnvironments

PLOT DATE: 23/06/2023 3:16:55 PM DWG FILE: K:\5C EIS JOBS\35000'S\E35521PT BLAYNEY\CAD\E35521PT.DWG

LEGEND

(red dashed line)	APPROXIMATE SITE BOUNDARY
BH(Fill Depth)	BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m) (JKE, 2022)
BH/MW(Fill Depth)	BOREHOLE AND GROUNDWATER MONITORING WELL LOCATION, NUMBER AND DEPTH OF FILL (m) (JKE, 2022)
BH102	BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m)
BH/MW101	BOREHOLE AND GROUNDWATER MONITORING WELL LOCATION, NUMBER AND DEPTH OF FILL (m)
SV1	SOIL VAPOUR IMPLANT AND DEPTH (m)
871	GROUNDWATER CONTOUR INTERVALS (m)
(arrow)	INFERRED GROUNDWATER FLOW DIRECTION

AERIAL IMAGE SOURCE: GOOGLE EARTH PRO

0 6 12 18 24 30
SCALE 1:600 @A3 METRES

This plan should be read in conjunction with the Environmental report.

Title: **GROUNDWATER CONTOUR PLOT**

Location: BLAYNEY DISTRICT HOSPITAL, 3 OSMAN STREET, BLAYNEY, NSW

Project No: E35521PT

Figure No: 5

JKEnvironments

Appendix B: Laboratory Results Summary Tables

ABBREVIATIONS AND EXPLANATIONS

Abbreviations used in the Tables:

ABC:	Ambient Background Concentration
ACM:	Asbestos Containing Material
ADWG:	AustralianDrinking Water Guidelines
AF:	Asbestos Fines
ANZG	Australian and New Zealand Guidelines
B(a)P:	Benzo(a)pyrene
CEC:	Cation Exchange Capacity
CRC:	Cooperative Research Centre
CT:	Contaminant Threshold
EILs:	Ecological Investigation Levels
ESLs:	Ecological Screening Levels
FA:	Fibrous Asbestos
GIL:	Groundwater Investigation Levels
GSW:	General Solid Waste
HILs:	Health Investigation Levels
HSLs:	Health Screening Levels
HSL-SSA:	Health Screening Level-SiteSpecific Assessment
kg/L	kilograms per litre
NA:	Not Analysed
NC:	Not Calculated
NEPM:	National Environmental Protection Measure
NHMRC:	National Health and Medical Research Council
NL:	Not Limiting
NSL:	No Set Limit
OCP:	Organochlorine Pesticides
OPP:	Organophosphorus Pesticides
PAHs:	Polycyclic Aromatic Hydrocarbons
%w/w:	weight per weight
ppm:	Parts per million
PCBs:	Polychlorinated Biphenyls
PCE:	Perchloroethylene (Tetrachloroethylene or Teterachloroethene)
pH_{KCL} :	pH of filtered 1:20, 1M KCL extract, shaken overnight
pH_{ox} :	pH of filtered 1:20 1M KCl after peroxide digestion
PQL:	Practical Quantitation Limit
RS:	Rinsate Sample
RSL:	Regional Screening Levels
RSW:	Restricted Solid Waste
SAC:	Site Assessment Criteria
SCC:	Specific Contaminant Concentration
S_{Cr}:	Chromium reducible sulfur
S_{POS}:	Peroxide oxidisable Sulfur
SSA:	Site Specific Assessment
SSHSLs:	Site Specific Health Screening Levels
TAA:	Total Actual Acidity in 1M KCL extract titrated to pH6.5
TB:	Trip Blank
TCA:	1,1,1 Trichloroethane (methyl chloroform)
TCE:	Trichloroethylene (Trichloroethene)
TCLP:	Toxicity Characteristics Leaching Procedure
TPA:	Total Potential Acidity, 1M KCL peroxide digest
TS:	Trip Spike
TRH:	Total Recoverable Hydrocarbons
TSA:	Total Sulfide Acidity (TPA-TAA)
UCL:	Upper Level Confidence Limit on Mean Value
USEPA	United States Environmental Protection Agency
VOCC:	Volatile Organic Chlorinated Compounds
WHO:	World Health Organisation

Table Specific Explanations:

HIL Tables:

- The chromium results are for Total Chromium which includes Chromium III and VI. For initial screening purposes, we have assumed that the samples contain only Chromium VI unless demonstrated otherwise by additional analysis.
- Carcinogenic PAHs is a toxicity weighted sum of analyte concentrations for a specific list of PAH compounds relative to B(a)P. It is also refered to as the B(a)P Toxic Equivalence Quotient (TEQ).
- Statistical calculations are undertaken using ProUCL (USEPA). Statistical calculation is usually undertaken using data from fill samples.

EIL/ESL Table:

Site specific ABC values for specific metals have been adopted.

Waste Classification and TCLP Table:

- Data assessed using the NSW EPA Waste Classification Guidelines, Part 1: Classifying Waste (2014).
- The assessment of Total Moderately Harmful pesticides includes: Dichlorovos, Dimethoate, Fenitrothion, Ethion, Malathion and Parathion.
- Assessment of Total Scheduled pesticides include: HBC, alpha-BHC, gamma-BHC, beta-BHC, Heptachlor, Aldrin, Heptachlor Epoxide, gamma-Chlordane, alpha-chlordane, pp-DDE, Dieldrin, Endrin, pp-DDD, pp-DDT, Endrin Aldehyde.

QA/QC Table:

- Field blank, Inter and Intra laboratory duplicate results are reported in mg/kg.
- Trip spike results are reported as percentage recovery.
- Field rinsate results are reported in µg/L.

TABLE S1
SOIL LABORATORY RESULTS COMPARED TO NEPM 2013.
HIL-A: 'Residential with garden/accessible soils; children's day care centers; preschools; and primary schools'

All data in mg/kg unless stated otherwise			HEAVY METALS								PAHs		ORGANOCHLORINE PESTICIDES (OCPs)							OP PESTICIDES (OPPs)		
			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	Carcinogenic PAHs	HCB	Endosulfan	Methoxychlor	Aldrin & Dieldrin	Chlordane	DDT, DDD & DDE	Heptachlor	Chlorpyrifos	TOTAL PCBs	ASBESTOS FIBRES
PQL - Envirolab Services			4	0.4	1	1	1	0.1	1	1	-	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	100
Site Assessment Criteria (SAC)			100	20	100	6000	300	40	400	7400	300	3	10	270	300	6	50	240	6	160	1	Detected/Not Detected
Sample Reference	**Sample Depth**	**Sample Description**																				
BH1	0.05-0.2	F: Clayey sand	<4	<0.4	10	24	1	<0.1	3	7	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH1 - [LAB_DUP]	0.05-0.2	F: Clayey sand	<4	<0.4	9	34	2	<0.1	3	8	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH1	0.5-0.8	F: Gravelly clayey sand	<4	<0.4	270	41	2	<0.1	220	15	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH1	3.0-3.2	Silty clay	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Not Detected
BH3	0-0.1	F: Silty clay	9	<0.4	53	30	18	<0.1	14	54	0.79	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH3	0.4-0.65	F: Silty clay	17	<0.4	30	42	260	0.1	15	180	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	Detected
BH5	0-0.1	F: Silt	<4	<0.4	19	36	40	0.8	7	200	0.09	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH5	0.5-0.7	Silty clay	<4	<0.4	19	12	10	0.2	6	32	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH6	0-0.1	F: Silty clay	<4	<0.4	26	38	11	<0.1	7	36	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH10	0-0.2	F: Silty clay	<4	<0.4	21	18	16	<0.1	10	26	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH12	0-0.1	Silty clay	<4	<0.4	29	18	19	<0.1	4	32	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH12	1.5-1.7	Silty clay	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Not Detected
BH13	1.5-1.7	Silty clay	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Not Detected
BH14	0-0.1	F: Silty clay	12	<0.4	32	14	20	<0.1	7	23	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH15	0-0.1	F: Silty clay	4	<0.4	28	15	15	<0.1	6	26	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH17	0.05-0.2	F: Clayey sand	<4	<0.4	23	20	2	<0.1	3	14	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH20	0.05-0.2	F: Clayey sand	<4	<0.4	33	52	3	<0.1	6	12	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH20	0.5-0.7	F: Gravelly sand	12	<0.4	360	86	2	<0.1	310	13	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	Not Detected
SDUP2	BH20 (0.05-0.2)	F: Clayey sand	<4	<0.4	24	46	2	<0.1	5	10	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
SDUP2 [LAB_DUP]	BH20 (0.05-0.2)	F: Clayey sand	NA	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	<0.1	NA	NA
SDUP3	BH15 0-0.1	F: Silty clay	<4	<0.4	29	16	17	<0.1	7	28	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
SDUP3 - [LAB_DUP]	BH15 0-0.1	F: Silty clay	<4	<0.4	25	17	14	<0.1	6	27	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH101	0-0.1	F: Silty Clay	7	<0.4	59	37	26	0.1	13	47	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH101 - [LAB_DUP]	0-0.1	F: Silty Clay	4	<0.4	48	46	22	<0.1	15	41	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH101	0.5-0.7	Silty Clay	<4	<0.4	11	11	7	<0.1	1	6	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH102	0-0.2	F: Silty Clay	<4	<0.4	35	28	13	<0.1	11	38	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH102 - [LAB_DUP]	0-0.2	F: Silty Clay	<4	<0.4	37	28	13	<0.1	11	37	1.8	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH102	0.65-0.9	Silty clay	<4	<0.4	21	28	13	<0.1	5	22	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH103	0-0.2	F: Silty Clay	4	<0.4	51	30	16	<0.1	14	32	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH104	0-0.2	F: Silty Clay	<4	<0.4	33	40	11	<0.1	8	31	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH105	0-0.2	F: Silty Clay	<4	<0.4	13	24	47	<0.1	6	74	0.59	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH105	0.4-0.7	Silty clay	<4	<0.4	11	10	10	<0.1	3	22	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH106	0-0.2	F: Silty Clay	<4	<0.4	39	17	13	<0.1	7	19	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH107	0.01-0.46	F: Silty Clayey Sand	<4	<0.4	27	3	3	<0.1	14	5	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH107	1.5-1.95	Silty Clay	5	<0.4	48	12	31	0.2	6	14	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH108	0-0.2	F: Silty Clay	4	<0.4	14	17	23	<0.1	6	47	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH109	0-0.2	F: Silty Clay	26	<0.4	17	52	37	<0.1	11	100	0.07	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.1	<0.1	Not Detected
BH109 - [LAB_DUP]	0-0.2	F: Silty Clay	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.1	<0.1	<0.1	<0.1	<0.1	0.3	<0.1	NA	NA	NA
BH109	0.8-1	Silty clay	50	<0.4	13	16	20	<0.1	6	49	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH110	0-0.2	F: Silty Clay	<4	<0.4	42	48	13	<0.1	7	49	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH110 - [LAB_DUP]	0-0.2	F: Silty Clay	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	NA	NA
BH111	0-0.2	F: Silty Clay	10	<0.4	45	30	20	<0.1	20	46	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH112	0-0.2	F: Silty Clay	79	0.5	66	36	64	0.4	52	98	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH112	0.4-0.6	Silty clay	72	<0.4	53	27	56	0.5	50	83	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH113	0-0.1	F: Silty Clay	120	<0.4	43	21	55	0.1	11	51	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH113	0.1-0.45	F: Silty Clay	<4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH113	0.6-0.95	Silty clay	<4	<0.4	27	8	13	<0.1	4	10	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH114	0-0.2	F: Silty Clay	4	<0.4	19	8	9	<0.1	7	12	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH114 - [LAB_DUP]	0-0.2	F: Silty Clay	4	<0.4	20	8	10	<0.1	6	12	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH115	0.01-0.2	F: Gravelly Clay	<4	<0.4	34	5	5	<0.1	20	10	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH116	0.015-0.45	F: Gravelly Clay	4	<0.4	120	59	3	<0.1	54	23	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH116 (Cr VI)	0.015-0.45	F: Gravelly Clay	NA	NA	120	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH116	1.5-1.95	Silty Clay	5	<0.4	46	12	19	<0.1	5	15	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH116	4.5-4.95	Silty Gravelly Clay	25	<0.4	85	98	37	<0.1	21	43	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH117	0.01-0.4	F: Gravelly Clay	10	<0.4	280	110	5	<0.1	130	38	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH117 (Cr VI)	0.01-0.4	F: Gravelly Clay	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH117	0.7-0.95	F: Gravelly Clay	<4	<0.4	31	12	22	<0.1	6	13	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH117 - [LAB_DUP]	0.7-0.95	F: Gravelly Clay	<4	<0.4	37	12	21	<0.1	6	13	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH117	1.6-1.95	Silty Clay	<4	<0.4	18	11	8	<0.1	4	20	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH117	3.0-3.4	Silty Clay	16	<0.4	54	170	17	<0.1	17	65	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH117 - [LAB_DUP]	3.0-3.4	Silty Clay	11	<0.4	23	180	26	<0.1	16	61	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH117 - [TRIPLICATE]	3.0-3.4	Silty Clay	11	<0.4	13	200	14	<0.1	17	71	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH118	0-0.2	F: Silty Clay	<4	<0.4	15	16	16	<0.1	5	21	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH118	0.6-0.8	Silty clay	<4	<0.4	21	12	11	<0.1	6	17	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH119	0-0.2	F: Silty Clay	<4	<0.4	33	26	21	<0.1	8	23	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH119	0.9-1.1	Silty clay	<4	<0.4	38	11	14	<0.1	5	10	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH120	0-0.1	F: Silty Clay	6	<0.4	61	13	18	<0.1	6	13	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH120 - [LAB_DUP]	0-0.1	F: Silty Clay	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	NA	NA
BH120	0.5-0.75	Silty Clay	5	<0.4	38	15	40	<0.1	6	13	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH121	0-0.1	F: Silty Clay	85	<0.4	31	22	53	<0.1	14	64	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH122	0.03-0.4	F: Gravelly Sand	<4	<0.4	7	40	2	<0.1	2	4	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH122	1.0-1.45	Silty Clay	<4	<0.4	26	9	16	<0.1	4	11	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SV1	0.5-0.8	F: Silty Sand	9	<0.4	39	15	9	<0.1	12	17	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
SDUP1	BH103 (0-0.2)	F: Silty Clay	5	<0.4	38	35	13	<0.1	10	34	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
SDUP2	BH102 (0-0.2)	F: Silty Clay	<4	<0.4	39	27	14	<0.1	12	52	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
SDUP101	BH116 (0.015-0.45)	F: Gravelly Clay	10	<0.4	250	93	6	<0.1	110	34	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
SDUP101 (Cr VI)	BH116 (0.015-0.45)	F: Gravelly Clay	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SDUP102	BH116 (4.5-4.95)	Silty Gravelly Clay	17	<0.4	51	66	19	<0.1	15	34	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
SDUP103	BH101 (0-0.1)	F: silty clay	4	<0.4	44	38	16	<0.1	13	40	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
SDUP104	BH122 (0.03-0.4)	F: Gravelly Sand	<4	<0.4	7	62	2	<0.1	1	6	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
SDUP104 - LAB DUP	BH122 (0.03-0.4)	F: Gravelly Sand	NA	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Number of Samples (DSI samples only)			52	51	54	51	51	51	51	51	51	51	39	39	39	39	39	39	39	36	36	24
Maximum Value (DSI samples only)			120	0.5	280	200	64	0.5	130	100	1.8	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.3	<PQL	<PQL	<PQL	Not Detected
Statistical Analysis on Fill Samples (PSI and DSI data)																						
Number of Fill Samples			37	NC	36	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Mean Value			14	NC	50	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Standard Deviation			25.0	NC	69.4	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
% UCL			95	NC	95	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
UCL Value			32.09	NC	68.39	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

Concentration above the SAC — **VALUE**
Concentration above the PQL — **Bold**

TABLE S2
SOIL LABORATORY RESULTS COMPARED TO HSLs
All data in mg/kg unless stated otherwise

					C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	Field PID Measurement
PQL - Envirolab Services					25	50	0.2	0.5	1	1	1	ppm
NEPM 2013 HSL Land Use Category					**HSL-A/B: LOW/HIGH DENSITY RESIDENTIAL**							
Sample Reference	**Sample Depth**	**Sample Description**	**Depth Category**	**Soil Category**								
BH1	0.05-0.2	F: Clayey sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH1 - [LAB_DUP]	0.05-0.2	F: Clayey sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH1	0.5-0.8	F: Gravelly clayey sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	4
BH3	0-0.1	F: Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH3	0.4-0.65	F: Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.1
BH5	0-0.1	F: Silt	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH5	0.5-0.7	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH6	0-0.1	F: Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH10	0-0.2	F: Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH12	0-0.1	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.1
BH13	1.5-1.7	Silty clay	0m to <1m	Sand	NA	NA	NA	NA	NA	NA	NA	0
BH14	0-0.1	F: Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.2
BH15	0-0.1	F: Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH17	0.05-0.2	F: Clayey sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH20	0.05-0.2	F: Clayey sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH20	0.5-0.7	F: Gravelly sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.5
SDUP2	BH20 (0.05-0.2)	F: Clayey sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	NA
SDUP2 [LAB_DUP]	BH20 (0.05-0.2)	F: Clayey sand	0m to <1m	Sand	NA	<50	NA	NA	NA	NA	NA	NA
SDUP3	BH15 0-0.1	F: Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	NA
SDUP3 - [LAB_DUP]	BH15 0-0.1	F: Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	NA
BH101	0-0.1	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.2
BH101 - [LAB_DUP]	0-0.1	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.2
BH101	0.5-0.7	Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.1
BH102	0-0.2	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH102 - [LAB_DUP]	0-0.2	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH102	0.65-0.9	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH103	0-0.2	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH104	0-0.2	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH105	0-0.2	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH105	0.4-0.7	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH106	0-0.2	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH107	0.01-0.46	F: Silty Clayey Sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH107	1.5-1.95	Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH108	0-0.2	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH109	0-0.2	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH109	0.8-1	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH110	0-0.2	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH111	0-0.2	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH112	0-0.2	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	2.5
BH112	0.4-0.6	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.1
BH113	0-0.1	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH113	0.6-0.95	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH114	0-0.2	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH114 - [LAB_DUP]	0-0.2	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH115	0.01-0.2	F: Gravelly Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH116	0.015-0.45	F: Gravelly Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.1
BH116 - [LAB_DUP]	0.015-0.45	F: Gravelly Clay	0m to <1m	Sand	NA	<50	NA	NA	NA	NA	NA	0.1
BH116	1.5-1.95	Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.4
BH116	4.5-4.95	Silty Gravelly Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH117	0.01-0.4	F: Gravelly Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH117	0.7-0.95	F: Gravelly Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH117 - [LAB_DUP]	0.7-0.95	F: Gravelly Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH117	1.6-1.95	Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH117	3.0-3.4	Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH117 - [LAB_DUP]	3.0-3.4	Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH118	0-0.2	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	1.1
BH118	0.6-0.8	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.3
BH119	0-0.2	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	2.6
BH119	0.9-1.1	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.9
BH120	0-0.1	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH120	0.5-0.75	Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH121	0-0.1	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH122	0.03-0.4	F: Gravelly Sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH122	1.0-1.45	Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
SV1	0.5-0.8	F: Silty Sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
SDUP1	BH103 (0-0.2)	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	-
SDUP2	BH102 (0-0.2)	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	-
SDUP101	BH116 (0.015-0.45)	F: Gravelly Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	-
SDUP102	BH116 (4.5-4.95)	Silty Gravelly Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	-
SDUP103	BH101 (0-0.1)	F: silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	-
SDUP104	BH122 (0.03-0.4)	F: Gravelly Sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	-
SDUP104 - LAB DUP	BH122 (0.03-0.4)	F: Gravelly Sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	-
Total Number of Samples (DSI samples only)					51	52	51	51	51	51	51	45
Maximum Value (DSI samples only)					<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	2.6

Concentration above the SAC **VALUE**
Concentration above the PQL **Bold**
The guideline corresponding to the concentration above the SAC is highlighted in grey in the Site Assessment Criteria Table below

HSL SOIL ASSESSMENT CRITERIA

Sample Reference	**Sample Depth**	**Sample Description**	**Depth Category**	**Soil Category**	C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene
BH1	0.05-0.2	F: Clayey sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH1 - [LAB_DUP]	0.05-0.2	F: Clayey sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH1	0.5-0.8	F: Gravelly clayey sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH3	0-0.1	F: Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH3	0.4-0.65	F: Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH5	0-0.1	F: Silt	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH5	0.5-0.7	Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH6	0-0.1	F: Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH10	0-0.2	F: Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH12	0-0.1	Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH13	1.5-1.7	Silty clay	0m to <1m	Sand	NA	NA	NA	NA	NA	NA	NA
BH14	0-0.1	F: Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH15	0-0.1	F: Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH17	0.05-0.2	F: Clayey sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH20	0.05-0.2	F: Clayey sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH20	0.5-0.7	F: Gravelly sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
SDUP2	BH20 (0.05-0.2)	F: Clayey sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
SDUP2 [LAB_DUP]	BH20 (0.05-0.2)	F: Clayey sand	0m to <1m	Sand	NA	110	NA	NA	NA	NA	NA
SDUP3	BH15 0-0.1	F: Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
SDUP3 - [LAB_DUP]	BH15 0-0.1	F: Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH101	0-0.1	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH101 - [LAB_DUP]	0-0.1	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH101	0.5-0.7	Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH102	0-0.2	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH102 - [LAB_DUP]	0-0.2	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH102	0.65-0.9	Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH103	0-0.2	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH104	0-0.2	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH105	0-0.2	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH105	0.4-0.7	Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH106	0-0.2	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH107	0.01-0.46	F: Silty Clayey Sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH107	1.5-1.95	Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH108	0-0.2	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH109	0-0.2	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH109	0.8-1	Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH110	0-0.2	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH111	0-0.2	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH112	0-0.2	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH112	0.4-0.6	Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH113	0-0.1	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH113	0.6-0.95	Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH114	0-0.2	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH114 - [LAB_DUP]	0-0.2	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH115	0.01-0.2	F: Gravelly Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH116	0.015-0.45	F: Gravelly Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH116 - [LAB_DUP]	0.015-0.45	F: Gravelly Clay	0m to <1m	Sand	NA	110	NA	NA	NA	NA	NA
BH116	1.5-1.95	Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH116	4.5-4.95	Silty Gravelly Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH117	0.01-0.4	F: Gravelly Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH117	0.7-0.95	F: Gravelly Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH117 - [LAB_DUP]	0.7-0.95	F: Gravelly Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH117	1.6-1.95	Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH117	3.0-3.4	Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH117 - [LAB_DUP]	3.0-3.4	Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH118	0-0.2	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH118	0.6-0.8	Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH119	0-0.2	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH119	0.9-1.1	Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH120	0-0.1	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH120	0.5-0.75	Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH121	0-0.1	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH122	0.03-0.4	F: Gravelly Sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH122	1.0-1.45	Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
SV1	0.5-0.8	F: Silty Sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
SDUP1	BH103 (0-0.2)	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
SDUP2	BH102 (0-0.2)	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
SDUP101	BH116 (0.015-0.45)	F: Gravelly Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
SDUP102	BH116 (4.5-4.95)	Silty Gravelly Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
SDUP103	BH101 (0-0.1)	F: silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
SDUP104	BH122 (0.03-0.4)	F: Gravelly Sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
SDUP104 - LAB DUP	BH122 (0.03-0.4)	F: Gravelly Sand	0m to <1m	Sand	45	110	0.5	160	55	40	3

TABLE S3
SOIL LABORATORY RESULTS COMPARED TO MANAGEMENT LIMITS
All data in mg/kg unless stated otherwise

			C_6-C_{10} (F1) plus BTEX	>C_{10}-C_{16} (F2) plus napthalene	>C_{16}-C_{34} (F3)	>C_{34}-C_{40} (F4)
PQL - Envirolab Services			25	50	100	100
NEPM 2013 Land Use Category			**RESIDENTIAL, PARKLAND & PUBLIC OPEN SPACE**			
Sample Reference	**Sample Depth**	**Soil Texture**				
BH1	0.05-0.2	Coarse	<25	<50	**120**	**150**
BH1 - [LAB_DUP]	0.05-0.2	Coarse	<25	<50	**180**	**240**
BH1	0.5-0.8	Coarse	<25	<50	<100	<100
BH3	0-0.1	Fine	<25	<50	<100	<100
BH3	0.4-0.65	Fine	<25	<50	<100	<100
BH5	0-0.1	Fine	<25	<50	<100	<100
BH5	0.5-0.7	Fine	<25	<50	<100	<100
BH6	0-0.1	Fine	<25	<50	<100	<100
BH10	0-0.2	Fine	<25	<50	<100	<100
BH12	0-0.1	Fine	<25	<50	**120**	<100
BH14	0-0.1	Fine	<25	<50	<100	<100
BH15	0-0.1	Fine	<25	<50	<100	<100
BH17	0.05-0.2	Coarse	<25	<50	<100	<100
BH20	0.05-0.2	Coarse	<25	<50	**190**	**300**
BH20	0.5-0.7	Coarse	<25	<50	<100	<100
SDUP2	BH20 (0.05-0.2)	Coarse	<25	<50	**250**	**440**
SDUP2 [LAB_DUP]	BH20 (0.05-0.2)	Coarse	NA	<50	**230**	**440**
SDUP3	BH15 0-0.1	Fine	<25	<50	<100	<100
SDUP3 - [LAB_DUP]	BH15 0-0.1	Fine	<25	<50	<100	<100
BH101	0-0.1	Fine	<25	<50	<100	<100
BH101 - [LAB_DUP]	0-0.1	Fine	<25	<50	<100	<100
BH101	0.5-0.7	Fine	<25	<50	<100	<100
BH102	0-0.2	Fine	<25	<50	<100	<100
BH102 - [LAB_DUP]	0-0.2	Fine	<25	<50	<100	<100
BH102	0.65-0.9	Fine	<25	<50	<100	<100
BH103	0-0.2	Fine	<25	<50	<100	<100
BH104	0-0.2	Fine	<25	<50	<100	<100
BH105	0-0.2	Fine	<25	<50	<100	<100
BH105	0.4-0.7	Fine	<25	<50	<100	<100
BH106	0-0.2	Fine	<25	<50	<100	<100
BH107	0.01-0.46	Coarse	<25	<50	<100	<100
BH107	1.5-1.95	Fine	<25	<50	<100	<100
BH108	0-0.2	Fine	<25	<50	<100	<100
BH109	0-0.2	Fine	<25	<50	<100	<100
BH109	0.8-1	Fine	<25	<50	<100	<100
BH110	0-0.2	Fine	<25	<50	<100	<100
BH111	0-0.2	Fine	<25	<50	<100	<100
BH112	0-0.2	Fine	<25	<50	<100	<100
BH112	0.4-0.6	Fine	<25	<50	<100	<100
BH113	0-0.1	Fine	<25	<50	<100	<100
BH113	0.6-0.95	Fine	<25	<50	<100	<100
BH114	0-0.2	Fine	<25	<50	<100	<100
BH114 - [LAB_DUP]	0-0.2	Fine	<25	<50	<100	<100
BH115	0.01-0.2	Fine	<25	<50	<100	<100
BH116	0.015-0.45	Fine	<25	<50	<100	<100
BH116 - [LAB_DUP]	0.015-0.45	Fine	NA	<50	<100	<100
BH116	1.5-1.95	Fine	<25	<50	<100	<100
BH116	4.5-4.95	Fine	<25	<50	<100	<100
BH117	0.01-0.4	Fine	<25	<50	<100	<100
BH117	0.7-0.95	Fine	<25	<50	<100	<100
BH117 - [LAB_DUP]	0.7-0.95	Fine	<25	<50	<100	<100
BH117	1.6-1.95	Fine	<25	<50	<100	<100
BH117	3.0-3.4	Fine	<25	<50	<100	<100
BH117 - [LAB_DUP]	3.0-3.4	Fine	<25	<50	<100	<100
BH118	0-0.2	Fine	<25	<50	<100	<100
BH118	0.6-0.8	Fine	<25	<50	<100	<100
BH119	0-0.2	Fine	<25	<50	<100	<100
BH119	0.9-1.1	Fine	<25	<50	<100	<100
BH120	0-0.1	Fine	<25	<50	<100	<100
BH120	0.5-0.75	Fine	<25	<50	<100	<100
BH121	0-0.1	Fine	<25	<50	<100	<100
BH122	0.03-0.4	Coarse	<25	<50	<100	<100
BH122	1.0-1.45	Fine	<25	<50	<100	<100
SV1	0.5-0.8	Coarse	<25	<50	<100	<100
SDUP1	BH103 (0-0.2)	Fine	<25	<50	<100	<100
SDUP2	BH102 (0-0.2)	Fine	<25	<50	**340**	**120**
SDUP101	BH116 (0.015-0.45)	Fine	<25	<50	<100	<100
SDUP102	BH116 (4.5-4.95)	Fine	<25	<50	<100	<100
SDUP103	BH101 (0-0.1)	Fine	<25	<50	<100	<100
SDUP104	BH122 (0.03-0.4)	Fine	<25	<50	<100	<100
SDUP104 - LAB DUP	BH122 (0.03-0.4)	Fine	<25	<50	<100	<100
Total Number of Samples (DSI samples only)			51	52	52	52
Maximum Value (DSI samples only)			<PQL	<PQL	340	120

Concentration above the SAC	**VALUE**
Concentration above the PQL	**Bold**

MANAGEMENT LIMIT ASSESSMENT CRITERIA

Sample Reference	**Sample Depth**	**Soil Texture**	C_6-C_{10} (F1) plus BTEX	>C_{10}-C_{16} (F2) plus napthalene	>C_{16}-C_{34} (F3)	>C_{34}-C_{40} (F4)
BH1	0.05-0.2	Coarse	700	1000	2500	10000
BH1 - [LAB_DUP]	0.05-0.2	Coarse	700	1000	2500	10000
BH1	0.5-0.8	Coarse	700	1000	2500	10000
BH3	0-0.1	Fine	800	1000	3500	10000
BH3	0.4-0.65	Fine	800	1000	3500	10000
BH5	0-0.1	Fine	800	1000	3500	10000
BH5	0.5-0.7	Fine	800	1000	3500	10000
BH6	0-0.1	Fine	800	1000	3500	10000
BH10	0-0.2	Fine	800	1000	3500	10000
BH12	0-0.1	Fine	800	1000	3500	10000
BH14	0-0.1	Fine	800	1000	3500	10000
BH15	0-0.1	Fine	800	1000	3500	10000
BH17	0.05-0.2	Coarse	700	1000	2500	10000
BH20	0.05-0.2	Coarse	700	1000	2500	10000
BH20	0.5-0.7	Coarse	700	1000	2500	10000
SDUP2	BH20 (0.05-0.2)	Coarse	700	1000	2500	10000
SDUP2 [LAB_DUP]	BH20 (0.05-0.2)	Coarse	NA	1000	2500	10000
SDUP3	BH15 0-0.1	Fine	800	1000	3500	10000
SDUP3 - [LAB_DUP]	BH15 0-0.1	Fine	800	1000	3500	10000
BH101	0-0.1	Fine	800	1000	3500	10000
BH101 - [LAB_DUP]	0-0.1	Fine	800	1000	3500	10000
BH101	0.5-0.7	Fine	800	1000	3500	10000
BH102	0-0.2	Fine	800	1000	3500	10000
BH102 - [LAB_DUP]	0-0.2	Fine	800	1000	3500	10000
BH102	0.65-0.9	Fine	800	1000	3500	10000
BH103	0-0.2	Fine	800	1000	3500	10000
BH104	0-0.2	Fine	800	1000	3500	10000
BH105	0-0.2	Fine	800	1000	3500	10000
BH105	0.4-0.7	Fine	800	1000	3500	10000
BH106	0-0.2	Fine	800	1000	3500	10000
BH107	0.01-0.46	Coarse	700	1000	2500	10000
BH107	1.5-1.95	Fine	800	1000	3500	10000
BH108	0-0.2	Fine	800	1000	3500	10000
BH109	0-0.2	Fine	800	1000	3500	10000
BH109	0.8-1	Fine	800	1000	3500	10000
BH110	0-0.2	Fine	800	1000	3500	10000
BH111	0-0.2	Fine	800	1000	3500	10000
BH112	0-0.2	Fine	800	1000	3500	10000
BH112	0.4-0.6	Fine	800	1000	3500	10000
BH113	0-0.1	Fine	800	1000	3500	10000
BH113	0.6-0.95	Fine	800	1000	3500	10000
BH114	0-0.2	Fine	800	1000	3500	10000
BH114 - [LAB_DUP]	0-0.2	Fine	800	1000	3500	10000
BH115	0.01-0.2	Fine	800	1000	3500	10000
BH116	0.015-0.45	Fine	800	1000	3500	10000
BH116 - [LAB_DUP]	0.015-0.45	Fine	NA	1000	3500	10000
BH116	1.5-1.95	Fine	800	1000	3500	10000
BH116	4.5-4.95	Fine	800	1000	3500	10000
BH117	0.01-0.4	Fine	800	1000	3500	10000
BH117	0.7-0.95	Fine	800	1000	3500	10000
BH117 - [LAB_DUP]	0.7-0.95	Fine	800	1000	3500	10000
BH117	1.6-1.95	Fine	800	1000	3500	10000
BH117	3.0-3.4	Fine	800	1000	3500	10000
BH117 - [LAB_DUP]	3.0-3.4	Fine	800	1000	3500	10000
BH118	0-0.2	Fine	800	1000	3500	10000
BH118	0.6-0.8	Fine	800	1000	3500	10000
BH119	0-0.2	Fine	800	1000	3500	10000
BH119	0.9-1.1	Fine	800	1000	3500	10000
BH120	0-0.1	Fine	800	1000	3500	10000
BH120	0.5-0.75	Fine	800	1000	3500	10000
BH121	0-0.1	Fine	800	1000	3500	10000
BH122	0.03-0.4	Coarse	700	1000	2500	10000
BH122	1.0-1.45	Fine	800	1000	3500	10000
SV1	0.5-0.8	Coarse	700	1000	2500	10000
SDUP1	BH103 (0-0.2)	Fine	800	1000	3500	10000
SDUP2	BH102 (0-0.2)	Fine	800	1000	3500	10000
SDUP101	BH116 (0.015-0.45)	Fine	800	1000	3500	10000
SDUP102	BH116 (4.5-4.95)	Fine	800	1000	3500	10000
SDUP103	BH101 (0-0.1)	Fine	800	1000	3500	10000
SDUP104	BH122 (0.03-0.4)	Fine	800	1000	3500	10000
SDUP104 - LAB DUP	BH122 (0.03-0.4)	Fine	800	1000	3500	10000

TABLE S4
SOIL LABORATORY RESULTS COMPARED T0 DIRECT CONTACT CRITERIA
All data in mg/kg unless stated otherwise

Analyte		C_6-C_{10}	>C_{10}-C_{16}	>C_{16}-C_{34}	>C_{34}-C_{40}	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	PID
PQL - Envirolab Services		25	50	100	100	0.2	0.5	1	1	1	
CRC 2011 -Direct contact Criteria		4,400	3,300	4,500	6,300	100	14,000	4,500	12,000	1,400	
Site Use		RESIDENTIAL WITH ACCESSIBLE SOIL- DIRECT SOIL CONTACT									
Sample Reference	**Sample Depth**										
BH1	0.05-0.2	<25	<50	**120**	**150**	<0.2	<0.5	<1	<1	<1	0
BH1 - [LAB_DUP]	0.05-0.2	<25	<50	**180**	**240**	<0.2	<0.5	<1	<1	<1	0
BH1	0.5-0.8	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**4**
BH3	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH3	0.4-0.65	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.1**
BH5	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH5	0.5-0.7	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH6	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH10	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH12	0-0.1	<25	<50	**120**	<100	<0.2	<0.5	<1	<1	<1	**0.1**
BH13	1.5-1.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	0
BH14	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.2**
BH15	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH17	0.05-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH20	0.05-0.2	<25	<50	**190**	**300**	<0.2	<0.5	<1	<1	<1	0
BH20	0.5-0.7	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.5**
SDUP2	BH20 (0.05-0.2)	<25	<50	**250**	**440**	<0.2	<0.5	<1	<1	<1	NA
SDUP2 [LAB_DUP]	BH20 (0.05-0.2)	NA	<50	**230**	**440**	NA	NA	NA	NA	NA	NA
SDUP3	BH15 0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	NA
SDUP3 - [LAB_DUP]	BH15 0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	NA
BH101	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.2**
BH101 - [LAB_DUP]	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.2**
BH101	0.5-0.7	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.1**
BH102	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH102 - [LAB_DUP]	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH102	0.65-0.9	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH103	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH104	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH105	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH105	0.4-0.7	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH106	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH107	0.01-0.46	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH107	1.5-1.95	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH108	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH109	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH109	0.8-1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH110	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH111	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH112	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**2.5**
BH112	0.4-0.6	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.1**
BH113	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH113	0.6-0.95	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH114	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH114 - [LAB_DUP]	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH115	0.01-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH116	0.015-0.45	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.1**
BH116 - [LAB_DUP]	0.015-0.45	NA	<50	<100	<100	NA	NA	NA	NA	NA	**0.1**
BH116 (Cr VI)	1.5-1.95	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.4**
BH116	4.5-4.95	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH117	0.01-0.4	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH117	0.7-0.95	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH117 - [LAB_DUP]	0.7-0.95	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH117	1.6-1.95	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH117	3.0-3.4	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH117 - [LAB_DUP]	3.0-3.4	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH118	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**1.1**
BH118	0.6-0.8	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.3**
BH119	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**2.6**
BH119	0.9-1.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.9**
BH120	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH120	0.5-0.75	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH121	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH122	0.03-0.4	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH122	1.0-1.45	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
SV1	0.5-0.8	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
SDUP1	BH103 (0-0.2)	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	-
SDUP2	BH102 (0-0.2)	<25	<50	**340**	**120**	<0.2	<0.5	<1	<1	<1	-
SDUP101	BH116 (0.015-0.45)	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	-
SDUP102	BH116 (4.5-4.95)	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	-
SDUP103	BH101 (0-0.1)	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	-
SDUP104	BH122 (0.03-0.4)	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	-
SDUP104 - LAB DUP	BH122 (0.03-0.4)	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	-
Total Number of Samples (DSI samples only)		51	52	52	52	51	51	51	51	51	45
Maximum Value (DSI samples only)		<PQL	<PQL	340	120	<PQL	<PQL	<PQL	<PQL	<PQL	2.6

Concentration above the SAC	**VALUE**
Concentration above the PQL	**Bold**

JKEnvironments

TABLE S5
ASBESTOS QUANTIFICATION - FIELD OBSERVATIONS AND LABORATORY RESULTS
HSL-A: Residential with garden/accessible soils; children's day care centers; preschools; and primary schools

FIELD DATA															LABORATORY DATA											
Date Sampled	Sample reference	Sample Depth	Visible ACM in top 100mm	Approx. Volume of Soil (L)	Soil Mass (g)	Mass ACM (g)	Mass Asbestos in ACM (g)	[Asbestos from ACM in soil] (%w/w)	Mass ACM <7mm (g)	Mass Asbestos in ACM <7mm (g)	[Asbestos from ACM <7mm in soil] (%w/w)	Mass FA (g)	Mass Asbestos in FA (g)	[Asbestos from FA in soil] (%w/w)	Lab Report Number	Sample refeference	Sample Depth	Sample Mass (g)	Asbestos ID in soil (AS4964) >0.1g/kg	Trace Analysis	Total Asbestos (g/kg)	Asbestos ID in soil <0.1g/kg	ACM >7mm Estimation (g)	FA and AF Estimation (g)	ACM >7mm Estimation %(w/w)	FA and AF Estimation %(w/w)
SAC			**No**					**0.01**			**0.001**			**0.001**											**0.01**	**0.001**
25/10/2022	BH1	0.05-0.5	No	10	10,870	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	309378	BH1	0.05-0.2	870.85	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
25/10/2022	BH1	0.5-1.0	NA	2.5	2,450	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24/10/2022	BH2	0-0.1	No	10	12,600	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24/10/2022	BH2	0.1-0.4	NA	2.5	2,450	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24/10/2022	BH3	0-0.1	No	10	10,470	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24/10/2022	BH3	0.1-0.4	NA	3.5	3,400	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	309378	BH3	0.4-0.65	738.11	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	Chrysotile:Amosite	–	0.0628	<0.01	0.0085
25/10/2022	BH4	0-0.1	No	10	10,300	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24/10/2022	BH5	0-0.1	No	10	10,530	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	309378	BH5	0-0.1	619.37	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
26/10/2022	BH6	0-0.1	No	10	12,050	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	309378	BH6	0-0.1	777.81	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
26/10/2022	BH7	0-0.1	No	10	11,980	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
27/10/2022	BH8	0-0.1	No	10	11,300	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
28/10/2022	BH9	0-0.1	No	10	7,900	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
28/10/2022	BH10	0-0.2	No	10	11,100	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	309378	BH10	0-0.2	736.87	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
28/10/2022	BH10	0.2-0.4	NA	10	11,050	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
27/10/2022	BH11	0.05-1.0	No	10	9,550	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
27/10/2022	BH11	1.0-1.2	NA	1.5	1,720	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
26/10/2022	BH12	0-0.1	No	10	10,450	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	309378	BH12	0-0.1	758.96	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
27/10/2022	BH13	0.05-0.5	No	4.5	4,450	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
26/10/2022	BH14	0-0.1	No	10	11,280	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	309378	BH14	0-0.1	732.9	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
26/10/2022	BH14	0.1-0.5	NA	4	3,800	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
26/10/2022	BH15	0.0-0.1	No	10	10,900	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	309378	BH15	0-0.1	701.89	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
26/10/2022	BH15	0.1-0.3	NA	3	3,050	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
27/10/2022	BH16	0.05-0.3	No	5.5	5,400	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25/10/2022	BH17	0.05-0.4	No	7	6,790	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	309378	BH17	0.05-0.2	772.09	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
27/10/2022	BH18	0.05-0.3	No	2.5	2,500	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
27/10/2022	BH18	0.3-1.0	NA	10	8,300	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25/10/2022	BH19	0.05-0.4	No	7	7,240	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25/10/2022	BH20	0.05-0.5	No	3.5	3,300	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25/10/2022	BH20	0.5-1.2	NA	4.5	4,770	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	309378	BH20	0.5-0.7	917.51	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
18/05/2023	BH101	0-0.1	No	10	10,700	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	323727	BH101	0-0.1	715.64	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
18/05/2023	BH101	0.1-0.4	NA	2	2,100	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
22/05/2023	BH102	0-0.2	No	10	10,420	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	324186	BH102	0-0.2	511.98	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
22/05/2023	BH103	0-0.2	No	10	10,120	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	324186	BH103	0-0.2	455.81	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
22/05/2023	BH104	0-0.2	No	10	10,610	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	324186	BH104	0-0.2	466.76	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
22/05/2023	BH104	0.4-0.6	NA	5	540	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	324186	BH105	0-0.2	442.96	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
22/05/2023	BH105	0-0.2	No	10	10,980	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
23/05/2023	BH106	0-0.2	No	5	5,010	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	324186	BH106	0-0.2	373.51	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
19/05/2023	BH107	0.01-1.0	No	10	7,520	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	323727	BH107	0.01-0.46	875.9	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
19/05/2023	BH107	1.0-1.4	NA	10	12,390	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
23/05/2023	BH108	0-0.2	No	10	7,910	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	324186	BH108	0-0.2	537.93	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
22/05/2023	BH109	0-0.2	No	10	12,010	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	324186	BH109	0-0.2	547.95	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
22/05/2023	BH110	0-0.2	No	10	11,430	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	324186	BH110	0-0.2	630.28	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
22/05/2023	BH111	0-0.2	No	10	10,670	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	324186	BH111	0-0.2	477.82	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
23/05/2023	BH112	0-0.2	No	10	13,010	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	324186	BH112	0-0.2	600.88	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
19/05/2023	BH113	0-0.1	No	10	10,030	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	323727	BH113	0-0.1	775.21	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
19/05/2023	BH113	0.1-0.5	NA	4	4,290	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
23/05/2023	BH114	0-0.2	No	10	10,020	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	324186	BH114	0-0.2	631.76	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
19/05/2023	BH115	0.01-0.5	No	10	9,800	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	323727	BH115	0.01-0.2	869.8	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
19/05/2023	BH116	0.015-0.45	No	--	--	--	--	--	--	--	--	--	--	--	323727	BH116	0.015-0.45	692.67	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
17/05/2023	BH117	0.01-0.4	No	--	--	--	--	--	--	--	--	--	--	--	323727	BH117	0.01-0.4	848.21	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	323727	BH117	0.7-0.95	279.06	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
23/05/2023	BH118	0-0.2	No	5	4,540	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	324186	BH118	0-0.2	413.6	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
23/05/2023	BH119	0-0.2	No	6	6,450	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	324186	BH119	0-0.2	461.19	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
18/05/2023	BH120	0-0.1	No	10	10,850	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	323727	BH120	0-0.1	758.56	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
18/05/2023	BH120	0.1-0.3	NA	3	2,900	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	323727	BH121	0-0.1	718.77	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
18/05/2023	BH121	0-0.1	No	--	--	--	--	--	--	--	--	--	--	--	323727	BH122	0.03-0.4	1037.63	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
18/05/2023	BH122	0.03-04	No	--	--	--	--	--	--	--	--	--	--	--	323727	SV1	0.5-0.8	817.76	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001

Concentration above the SAC **VALUE**

JKEnvironments

TABLE S6
SOIL LABORATORY RESULTS COMPARED TO NEPM 2013 EILs AND ESLs
All data in mg/kg unless stated otherwise

Land Use Category				URBAN RESIDENTIAL AND PUBLIC OPEN SPACE																			
							AGED HEAVY METALS-EILs						EILs		ESLs								
				pH	CEC (cmolc/kg)	Clay Content (% clay)	Arsenic	Chromium	Copper	Lead	Nickel	Zinc	Naphthalene	DDT	C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	>C_{16}-C_{34} (F3)	>C_{34}-C_{40} (F4)	Benzene	Toluene	Ethylbenzene	Total Xylenes	B(a)P
PQL - Envirolab Services				-	1	-	4	1	1	1	1	1	1	0.1	25	50	100	100	0.2	0.5	1	1	0.05
Ambient Background Concentration (ABC)				-	-	-	NSL	13	28	163	5	122	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL
Sample Reference	**Sample Depth**	**Sample Description**	**Soil Texture**																				
BH1	0.05-0.2	F: Clayey sand	Coarse	NA	NA	NA	<4	**10**	**24**	**1**	**3**	**7**	<1	<0.1	<25	<50	**120**	**150**	<0.2	<0.5	<1	<1	<0.05
BH1 - [LAB_DUP]	0.05-0.2	F: Clayey sand	Coarse	NA	NA	NA	<4	**9**	**34**	**2**	**3**	**8**	<1	<0.1	<25	<50	**180**	**240**	<0.2	<0.5	<1	<1	<0.05
BH1	0.5-0.8	F: Gravelly clayey sand	Coarse	NA	**28**	**8**	<4	**270**	**41**	**2**	**220**	**15**	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH3	0-0.1	F: Silty clay	Fine	NA	NA	NA	**9**	**53**	**30**	**18**	**14**	**54**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	**0.2**
BH3	0.4-0.65	F: Silty clay	Fine	NA	NA	NA	**17**	**30**	**42**	**260**	**15**	**180**	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH5	0-0.1	F: Silt	Fine	**6.65**	**12.5**	NA	<4	**19**	**36**	**40**	**7**	**200**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	**0.09**
BH5	0.5-0.7	Silty clay	Fine	NA	NA	NA	<4	**19**	**12**	**10**	**6**	**32**	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH6	0-0.1	F: Silty clay	Fine	NA	NA	NA	<4	**26**	**38**	**11**	**7**	**36**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH10	0-0.2	F: Silty clay	Fine	NA	NA	NA	<4	**21**	**18**	**16**	**10**	**26**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH12	0-0.1	Silty clay	Fine	NA	NA	NA	<4	**29**	**18**	**19**	**4**	**32**	<1	<0.1	<25	<50	**120**	<100	<0.2	<0.5	<1	<1	<0.05
BH13	1.5-1.7	Silty clay	Fine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH14	0-0.1	F: Silty clay	Fine	NA	NA	NA	**12**	**32**	**14**	**20**	**7**	**23**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH15	0-0.1	F: Silty clay	Fine	NA	NA	NA	**4**	**28**	**15**	**15**	**6**	**26**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH17	0.05-0.2	F: Clayey sand	Coarse	NA	NA	NA	<4	**23**	**20**	**2**	**3**	**14**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH20	0.05-0.2	F: Clayey sand	Coarse	NA	NA	NA	<4	**33**	**52**	**3**	**6**	**12**	<1	<0.1	<25	<50	**190**	**300**	<0.2	<0.5	<1	<1	<0.05
BH20	0.5-0.7	F: Gravelly sand	Coarse	NA	**32**	**7**	**12**	**360**	**86**	**2**	**310**	**13**	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
SDUP2	BH20 (0.05-0.2)	F: Clayey sand	Coarse	NA	NA	NA	<4	**24**	**46**	**2**	**5**	**10**	<1	<0.1	<25	<50	**250**	**440**	<0.2	<0.5	<1	<1	<0.05
SDUP2 [LAB_DUP]	BH20 (0.05-0.2)	F: Clayey sand	Coarse	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<50	**230**	**440**	NA	NA	NA	NA	<0.05
SDUP3	BH15 0-0.1	F: Silty clay	Fine	NA	NA	NA	<4	**29**	**16**	**17**	**7**	**28**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
SDUP3 - [LAB_DUP]	BH15 0-0.1	F: Silty clay	Fine	NA	NA	NA	<4	**25**	**17**	**14**	**6**	**27**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH101	0-0.1	F: Silty Clay	Fine	NA	NA	NA	**7**	**59**	**37**	**26**	**13**	**47**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH101 - [LAB_DUP]	0-0.1	F: Silty Clay	Fine	NA	NA	NA	**4**	**48**	**46**	**22**	**15**	**41**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH101	0.5-0.7	Silty Clay	Fine	NA	NA	NA	<4	**11**	**11**	**7**	**1**	**6**	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH102	0-0.2	F: Silty Clay	Fine	NA	NA	NA	<4	**35**	**28**	**13**	**11**	**38**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH102 - [LAB_DUP]	0-0.2	F: Silty Clay	Fine	NA	NA	NA	<4	**37**	**28**	**13**	**11**	**37**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	**0.2**
BH102	0.65-0.9	Silty clay	Fine	NA	NA	NA	<4	**21**	**28**	**13**	**5**	**22**	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH103	0-0.2	F: Silty Clay	Fine	NA	NA	NA	**4**	**51**	**30**	**16**	**14**	**32**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH104	0-0.2	F: Silty Clay	Fine	NA	NA	NA	<4	**33**	**40**	**11**	**8**	**31**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH105	0-0.2	F: Silty Clay	Fine	NA	NA	NA	<4	**13**	**24**	**47**	**6**	**74**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	**0.1**
BH105	0.4-0.7	Silty clay	Fine	NA	NA	NA	<4	**11**	**10**	**10**	**3**	**22**	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH106	0-0.2	F: Silty Clay	Fine	NA	NA	NA	<4	**39**	**17**	**13**	**7**	**19**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH107	0.01-0.46	F: Silty Clayey Sand	Coarse	NA	NA	NA	<4	**27**	**3**	**3**	**14**	**5**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH107	1.5-1.95	Silty Clay	Fine	NA	NA	NA	**5**	**48**	**12**	**31**	**6**	**14**	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH108	0-0.2	F: Silty Clay	Fine	NA	NA	NA	**4**	**14**	**17**	**23**	**6**	**47**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH109	0-0.2	F: Silty Clay	Fine	NA	NA	NA	**26**	**17**	**52**	**37**	**11**	**100**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	**0.07**
BH109 - [LAB_DUP]	0-0.2	F: Silty Clay	Fine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH109	0.8-1	Silty clay	Fine	NA	NA	NA	**50**	**13**	**16**	**20**	**6**	**49**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH110	0-0.2	F: Silty Clay	Fine	NA	NA	NA	<4	**42**	**48**	**13**	**7**	**49**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH110 - [LAB_DUP]	0-0.2	F: Silty Clay	Fine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH111	0-0.2	F: Silty Clay	Fine	NA	NA	NA	**10**	**45**	**30**	**20**	**20**	**46**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH112	0-0.2	F: Silty Clay	Fine	NA	**8.5**	NA	**79**	**66**	**36**	**64**	**52**	**98**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH112	0.4-0.6	Silty clay	Fine	NA	**11**	NA	**72**	**53**	**27**	**56**	**50**	**83**	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH113	0-0.1	F: Silty Clay	Fine	NA	NA	NA	**120**	**43**	**21**	**55**	**11**	**51**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH113	0.1-0.45	F: Silty Clay	Fine	NA	NA	NA	<4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH113	0.6-0.95	Silty clay	Fine	NA	NA	NA	<4	**27**	**8**	**13**	**4**	**10**	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH114	0-0.2	F: Silty Clay	Fine	NA	NA	NA	**4**	**19**	**8**	**9**	**7**	**12**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH114 - [LAB_DUP]	0-0.2	F: Silty Clay	Fine	NA	NA	NA	**4**	**20**	**8**	**10**	**6**	**12**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH115	0.01-0.2	F: Gravelly Clay	Fine	NA	NA	NA	<4	**34**	**5**	**5**	**20**	**10**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH116	0.015-0.45	F: Gravelly Clay	Fine	NA	**28**	NA	**4**	**120**	**59**	**3**	**54**	**23**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH116 - [LAB_DUP]	0.015-0.45	F: Gravelly Clay	Fine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<50	<100	<100	NA	NA	NA	NA	NA
BH116 (Cr VI)	0.015-0.45	F: Gravelly Clay	Fine	NA	NA	NA	NA	**120**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH116	1.5-1.95	Silty Clay	Fine	NA	NA	NA	**5**	**46**	**12**	**19**	**5**	**15**	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH116	4.5-4.95	Silty Gravelly Clay	Fine	**6.6**	**4.3**	NA	**25**	**85**	**98**	**37**	**21**	**43**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH117	0.01-0.4	F: Gravelly Clay	Fine	**8**	**22**	**6**	**10**	**280**	**110**	**5**	**130**	**38**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH117 (Cr VI)	0.01-0.4	F: Gravelly Clay	Fine	NA	NA	NA	NA	**2**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH117	0.7-0.95	F: Gravelly Clay	Fine	NA	NA	NA	<4	**31**	**12**	**22**	**6**	**13**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH117 - [LAB_DUP]	0.7-0.95	F: Gravelly Clay	Fine	NA	NA	NA	<4	**37**	**12**	**21**	**6**	**13**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH117	1.6-1.95	Silty Clay	Fine	NA	NA	NA	<4	**18**	**11**	**8**	**4**	**20**	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH117	3.0-3.4	Silty Clay	Fine	**5.9**	**11**	NA	**16**	**54**	**170**	**17**	**17**	**65**	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH117 - [LAB_DUP]	3.0-3.4	Silty Clay	Fine	**5.9**	**11**	NA	**11**	**23**	**180**	**26**	**16**	**61**	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH117 - [TRIPLICATE]	3.0-3.4	Silty Clay	Fine	**5.9**	**11**	NA	**11**	**13**	**200**	**14**	**17**	**71**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH118	0-0.2	F: Silty Clay	Fine	NA	NA	NA	<4	**15**	**16**	**16**	**5**	**21**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH118	0.6-0.8	Silty clay	Fine	NA	NA	NA	<4	**21**	**12**	**11**	**6**	**17**	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH119	0-0.2	F: Silty Clay	Fine	NA	NA	NA	<4	**33**	**26**	**21**	**8**	**23**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH119	0.9-1.1	Silty clay	Fine	NA	NA	NA	<4	**38**	**11**	**14**	**5**	**10**	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH120	0-0.1	F: Silty Clay	Fine	NA	NA	NA	**6**	**61**	**13**	**18**	**6**	**13**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH120 - [LAB_DUP]	0-0.1	F: Silty Clay	Fine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH120	0.5-0.75	Silty Clay	Fine	NA	NA	NA	**5**	**38**	**15**	**40**	**6**	**13**	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH121	0-0.1	F: Silty Clay	Fine	NA	NA	NA	**85**	**31**	**22**	**53**	**14**	**64**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH122	0.03-0.4	F: Gravelly Sand	Coarse	NA	NA	NA	<4	**7**	**40**	**2**	**2**	**4**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH122	1.0-1.45	Silty Clay	Fine	NA	NA	NA	<4	**26**	**9**	**16**	**4**	**11**	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
SV1	0.5-0.8	F: Silty Sand	Coarse	NA	NA	NA	**9**	**39**	**15**	**9**	**12**	**17**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
SDUP1	BH103 (0-0.2)	F: Silty Clay	Fine	NA	NA	NA	**5**	**38**	**35**	**13**	**10**	**34**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
SDUP2	BH102 (0-0.2)	F: Silty Clay	Fine	NA	NA	NA	<4	**39**	**27**	**14**	**12**	**52**	<1	<0.1	<25	<50	**340**	**120**	<0.2	<0.5	<1	<1	<0.05
SDUP101	BH116 (0.015-0.45)	F: Gravelly Clay	Fine	**7.5**	**16**	**17**	**10**	**250**	**93**	**6**	**110**	**34**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
SDUP101 (Cr VI)	BH116 (0.015-0.45)	F: Gravelly Clay	Fine	NA	NA	NA	NA	**1**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SDUP102	BH116 (4.5-4.95)	Silty Gravelly Clay	Fine	NA	NA	NA	**17**	**51**	**66**	**19**	**15**	**34**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
SDUP103	BH101 (0-0.1)	F: silty clay	Fine	NA	NA	NA	**4**	**44**	**38**	**16**	**13**	**40**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
SDUP104	BH122 (0.03-0.4)	F: Gravelly Sand	Fine	NA	NA	NA	<4	**7**	**62**	**2**	**1**	**6**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
SDUP104 - LAB DUP	BH122 (0.03-0.4)	F: Gravelly Sand	Fine	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
Total Number of Samples (DSI samples only)				7	12	4	70	72	69	69	69	69	69	53	69	71	71	71	69	69	69	69	70
Maximum Value (DSI samples only)				8	32	17	120	360	200	260	310	200	<PQL	<PQL	<PQL	<PQL	340	440	<PQL	<PQL	<PQL	<PQL	0.2

Concentration above the SAC: VALUE
Concentration above the PQL: **Bold**
The guideline corresponding to the elevated value is highlighted in grey in the EIL and ESL Assessment Criteria Table below

EIL AND ESL ASSESSMENT CRITERIA

Sample Reference	Sample Depth	Sample Description	Soil Texture	pH	CEC (cmolc/kg)	Clay Content (% clay)	Arsenic	Chromium	Copper	Lead	Nickel	Zinc	Naphthalene	DDT	C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	>C_{16}-C_{34} (F3)	>C_{34}-C_{40} (F4)	Benzene	Toluene	Ethylbenzene	Total Xylenes	B(a)P
BH1	0.05-0.2	F: Clayey sand	Coarse	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	300	2800	50	85	70	105	20
BH1 - [LAB_DUP]	0.05-0.2	F: Clayey sand	Coarse	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	300	2800	50	85	70	105	20
BH1	0.5-0.8	F: Gravelly clayey sand	Coarse	NA	28	8	100	410	90	1300	360	190	170	--	180	120	300	2800	50	85	70	105	20
BH3	0-0.1	F: Silty clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
BH3	0.4-0.65	F: Silty clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	--	180	120	1300	5600	65	105	125	45	20
BH5	0-0.1	F: Silt	Fine	6.65	12.5	NA	100	200	240	1300	280	820	170	180	180	120	1300	5600	65	105	125	45	20
BH5	0.5-0.7	Silty clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	--	180	120	1300	5600	65	105	125	45	20
BH6	0-0.1	F: Silty clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
BH10	0-0.2	F: Silty clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
BH12	0-0.1	Silty clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
BH13	1.5-1.7	Silty clay	Fine	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BH14	0-0.1	F: Silty clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
BH15	0-0.1	F: Silty clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
BH17	0.05-0.2	F: Clayey sand	Coarse	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	300	2800	50	85	70	105	20
BH20	0.05-0.2	F: Clayey sand	Coarse	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	300	2800	50	85	70	105	20
BH20	0.5-0.7	F: Gravelly sand	Coarse	NA	32	7	100	410	90	1300	420	190	170	--	180	120	300	2800	50	85	70	105	20
SDUP2	BH20 (0.05-0.2)	F: Clayey sand	Coarse	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	300	2800	50	85	70	105	20
SDUP2 [LAB_DUP]	BH20 (0.05-0.2)	F: Clayey sand	Coarse	NA	NA	NA	--	--	--	--	--	--	--	--	--	120	300	2800	--	--	--	--	20
SDUP3	BH15 0-0.1	F: Silty clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
SDUP3 - [LAB_DUP]	BH15 0-0.1	F: Silty clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
BH101	0-0.1	F: Silty Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
BH101 - [LAB_DUP]	0-0.1	F: Silty Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
BH101	0.5-0.7	Silty Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	--	180	120	1300	5600	65	105	125	45	20
BH102	0-0.2	F: Silty Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
BH102 - [LAB_DUP]	0-0.2	F: Silty Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
BH102	0.65-0.9	Silty clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	--	180	120	1300	5600	65	105	125	45	20
BH103	0-0.2	F: Silty Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
BH104	0-0.2	F: Silty Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
BH105	0-0.2	F: Silty Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
BH105	0.4-0.7	Silty clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	--	180	120	1300	5600	65	105	125	45	20
BH106	0-0.2	F: Silty Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
BH107	0.01-0.46	F: Silty Clayey Sand	Coarse	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	300	2800	50	85	70	105	20
BH107	1.5-1.95	Silty Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	--	180	120	1300	5600	65	105	125	45	20
BH108	0-0.2	F: Silty Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
BH109	0-0.2	F: Silty Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
BH109 - [LAB_DUP]	0-0.2	F: Silty Clay	Fine	NA	NA	NA	--	--	--	--	--	--	--	180	--	--	--	--	--	--	--	--	--
BH109	0.8-1	Silty clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
BH110	0-0.2	F: Silty Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
BH110 - [LAB_DUP]	0-0.2	F: Silty Clay	Fine	NA	NA	NA	--	--	--	--	--	--	--	180	--	--	--	--	--	--	--	--	--
BH111	0-0.2	F: Silty Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
BH112	0-0.2	F: Silty Clay	Fine	NA	8.5	NA	100	200	90	1300	180	190	170	180	180	120	1300	5600	65	105	125	45	20
BH112	0.4-0.6	Silty clay	Fine	NA	11	NA	100	200	90	1300	280	190	170	--	180	120	1300	5600	65	105	125	45	20
BH113	0-0.1	F: Silty Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
BH113	0.1-0.45	F: Silty Clay	Fine	NA	NA	NA	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BH113	0.6-0.95	Silty clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	--	180	120	1300	5600	65	105	125	45	20
BH114	0-0.2	F: Silty Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
BH114 - [LAB_DUP]	0-0.2	F: Silty Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
BH115	0.01-0.2	F: Gravelly Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
BH116	0.015-0.45	F: Gravelly Clay	Fine	NA	28	NA	100	200	90	1300	360	190	170	180	180	120	1300	5600	65	105	125	45	20
BH116 - [LAB_DUP]	0.015-0.45	F: Gravelly Clay	Fine	NA	NA	NA	--	--	--	--	--	--	--	--	--	120	1300	5600	--	--	--	--	--
BH116 (Cr VI)	0.015-0.45	F: Gravelly Clay	Fine	NA	NA	NA	--	200	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BH116	1.5-1.95	Silty Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	--	180	120	1300	5600	65	105	125	45	20
BH116	4.5-4.95	Silty Gravelly Clay	Fine	6.6	4.3	NA	100	200	120	1300	35	350	170	180	180	120	1300	5600	65	105	125	45	20
BH117	0.01-0.4	F: Gravelly Clay	Fine	8	22	6	100	410	250	1300	360	1100	170	180	180	120	1300	5600	65	105	125	45	20
BH117 (Cr VI)	0.01-0.4	F: Gravelly Clay	Fine	NA	NA	NA	--	200	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BH117	0.7-0.95	F: Gravelly Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
BH117 - [LAB_DUP]	0.7-0.95	F: Gravelly Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
BH117	1.6-1.95	Silty Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	--	180	120	1300	5600	65	105	125	45	20
BH117	3.0-3.4	Silty Clay	Fine	5.9	11	NA	100	200	220	1300	280	520	170	--	180	120	1300	5600	65	105	125	45	20
BH117 - [LAB_DUP]	3.0-3.4	Silty Clay	Fine	5.9	11	NA	100	200	220	1300	280	520	170	--	180	120	1300	5600	65	105	125	45	20
BH117 - [TRIPLICATE]	3.0-3.4	Silty Clay	Fine	5.9	11	NA	100	200	220	1300	280	520	--	--	--	--	--	--	--	--	--	--	--
BH118	0-0.2	F: Silty Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
BH118	0.6-0.8	Silty clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	--	180	120	1300	5600	65	105	125	45	20
BH119	0-0.2	F: Silty Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
BH119	0.9-1.1	Silty clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	--	180	120	1300	5600	65	105	125	45	20
BH120	0-0.1	F: Silty Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
BH120 - [LAB_DUP]	0-0.1	F: Silty Clay	Fine	NA	NA	NA	--	--	--	--	--	--	--	180	--	--	--	--	--	--	--	--	--
BH120	0.5-0.75	Silty Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	--	180	120	1300	5600	65	105	125	45	20
BH121	0-0.1	F: Silty Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
BH122	0.03-0.4	F: Gravelly Sand	Coarse	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	300	2800	50	85	70	105	20
BH122	1.0-1.45	Silty Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	--	180	120	1300	5600	65	105	125	45	20
SV1	0.5-0.8	F: Silty Sand	Coarse	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	300	2800	50	85	70	105	20
SDUP1	BH103 (0-0.2)	F: Silty Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
SDUP2	BH102 (0-0.2)	F: Silty Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
SDUP101	BH116 (0.015-0.45)	F: Gravelly Clay	Fine	7.5	16	17	100	410	240	1300	280	820	170	180	180	120	1300	5600	65	105	125	45	20
SDUP101 (Cr VI)	BH116 (0.015-0.45)	F: Gravelly Clay	Fine	NA	NA	NA	--	200	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SDUP102	BH116 (4.5-4.95)	Silty Gravelly Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
SDUP103	BH101 (0-0.1)	F: silty clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
SDUP104	BH122 (0.03-0.4)	F: Gravelly Sand	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
SDUP104 - LAB DUP	BH122 (0.03-0.4)	F: Gravelly Sand	Fine	NA	NA	NA	--	--	--	--	--	--	170	--	180	120	1300	5600	65	105	125	45	20

TABLE S7
SOIL LABORATORY RESULTS COMPARED TO WASTE CLASSIFICATION GUIDELINES
All data in mg/kg unless stated otherwise

			HEAVY METALS								PAHs		OC/OP PESTICIDES				Total PCBs	TRH					BTEX COMPOUNDS				ASBESTOS FIBRES
			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	B(a)P	Total Endosulfans	Chloropyrifos	Total Moderately Harmful	Total Scheduled		C_6-C_9	C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C_{36}	Total C_{10}-C_{36}	Benzene	Toluene	Ethyl benzene	Total Xylenes	
PQL - Envirolab Services			4	0.4	1	1	1	0.1	1	1	-	0.05	0.1	0.1	0.1	0.1	0.1	25	50	100	100	50	0.2	0.5	1	1	100
General Solid Waste CT1			100	20	100	NSL	100	4	40	NSL	200	0.8	60	4	250	50	50	650		NSL		10,000	10	288	600	1,000	-
General Solid Waste SCC1			500	100	1900	NSL	1500	50	1050	NSL	200	10	108	7.5	250	50	50	650		NSL		10,000	18	518	1,080	1,800	-
Restricted Solid Waste CT2			400	80	400	NSL	400	16	160	NSL	800	3.2	240	16	1000	50	50	2600		NSL		40,000	40	1,152	2,400	4,000	-
Restricted Solid Waste SCC2			2000	400	7600	NSL	6000	200	4200	NSL	800	23	432	30	1000	50	50	2600		NSL		40,000	72	2,073	4,320	7,200	-
Sample Reference	**Sample Depth**	**Sample Description**																									
BH1	0.05-0.2	F: Clayey sand	<4	<0.4	10	24	1	<0.1	3	7	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	110	110	<0.2	<0.5	<1	<1	Not Detected
BH1 - [LAB_DUP]	0.05-0.2	F: Clayey sand	<4	<0.4	9	34	2	<0.1	3	8	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	170	170	<0.2	<0.5	<1	<1	NA
BH1	0.5-0.8	F: Gravelly clayey sand	<4	<0.4	270	41	2	<0.1	220	15	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH1	3.0-3.2	Silty clay	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Not Detected
BH3	0-0.1	F: Silty clay	9	<0.4	53	30	18	<0.1	14	54	0.79	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH3	0.4-0.65	F: Silty clay	17	<0.4	30	42	260	0.1	15	180	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Detected
BH5	0-0.1	F: Silt	<4	<0.4	19	36	40	0.8	7	200	0.09	0.09	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH5	0.5-0.7	Silty clay	<4	<0.4	19	12	10	0.2	6	32	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH6	0-0.1	F: Silty clay	<4	<0.4	26	38	11	<0.1	7	36	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH10	0-0.2	F: Silty clay	<4	<0.4	21	18	16	<0.1	10	26	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH12	0-0.1	Silty clay	<4	<0.4	29	18	19	<0.1	4	32	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH12	1.5-1.7	Silty clay	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Not Detected
BH13	1.5-1.7	Silty clay	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Not Detected
BH14	0-0.1	F: Silty clay	12	<0.4	32	14	20	<0.1	7	23	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH15	0-0.1	F: Silty clay	4	<0.4	28	15	15	<0.1	6	26	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH17	0.05-0.2	F: Clayey sand	<4	<0.4	23	20	2	<0.1	3	14	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH20	0.05-0.2	F: Clayey sand	<4	<0.4	33	52	3	<0.1	6	12	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	200	200	<0.2	<0.5	<1	<1	NA
BH20	0.5-0.7	F: Gravelly sand	12	<0.4	360	86	2	<0.1	310	13	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
SDUP2	BH20 (0.05-0.2)	F: Clayey sand	<4	<0.4	24	46	2	<0.1	5	10	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	310	310	<0.2	<0.5	<1	<1	NA
SDUP2 [LAB_DUP]	BH20 (0.05-0.2)	F: Clayey sand	NA	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.05	NA	<0.1	<0.1	<0.1	NA	NA	<50	<100	280	280	NA	NA	NA	NA	NA
SDUP3	BH15 0-0.1	F: Silty clay	<4	<0.4	29	16	17	<0.1	7	28	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
SDUP3 - [LAB_DUP]	BH15 0-0.1	F: Silty clay	<4	<0.4	25	17	14	<0.1	6	27	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH101	0-0.1	F: Silty Clay	7	<0.4	59	37	26	0.1	13	47	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH101 - [LAB_DUP]	0-0.1	F: Silty Clay	4	<0.4	48	46	22	<0.1	15	41	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH101	0.5-0.7	Silty Clay	<4	<0.4	11	11	7	<0.1	1	6	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH102	0-0.2	F: Silty Clay	<4	<0.4	35	28	13	<0.1	11	38	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH102 - [LAB_DUP]	0-0.2	F: Silty Clay	<4	<0.4	37	28	13	<0.1	11	37	1.8	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH102	0.65-0.9	Silty clay	<4	<0.4	21	28	13	<0.1	5	22	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH103	0-0.2	F: Silty Clay	4	<0.4	51	30	16	<0.1	14	32	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH104	0-0.2	F: Silty Clay	<4	<0.4	33	40	11	<0.1	8	31	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH105	0-0.2	F: Silty Clay	<4	<0.4	13	24	47	<0.1	6	74	0.59	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH105	0.4-0.7	Silty clay	<4	<0.4	11	10	10	<0.1	3	22	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH106	0-0.2	F: Silty Clay	<4	<0.4	39	17	13	<0.1	7	19	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH107	0.01-0.46	F: Silty Clayey Sand	<4	<0.4	27	3	3	<0.1	14	5	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH107	1.5-1.95	Silty Clay	5	<0.4	48	12	31	0.2	6	14	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH108	0-0.2	F: Silty Clay	4	<0.4	14	17	23	<0.1	6	47	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH109	0-0.2	F: Silty Clay	26	<0.4	17	52	37	<0.1	11	100	0.07	0.07	<0.1	<0.1	<0.1	0.2	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH109 - [LAB_DUP]	0-0.2	F: Silty Clay	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.1	NA	NA	0.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH109	0.8-1	Silty clay	50	<0.4	13	16	20	<0.1	6	49	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH110	0-0.2	F: Silty Clay	<4	<0.4	42	48	13	<0.1	7	49	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH110 - [LAB_DUP]	0-0.2	F: Silty Clay	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH111	0-0.2	F: Silty Clay	10	<0.4	45	30	20	<0.1	20	46	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH112	0-0.2	F: Silty Clay	79	0.5	66	36	64	0.4	52	98	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH112	0.4-0.6	Silty clay	72	<0.4	53	27	56	0.5	50	83	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH113	0-0.1	F: Silty Clay	120	<0.4	43	21	55	0.1	11	51	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH113	0.1-0.45	F: Silty Clay	<4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH113	0.6-0.95	Silty clay	<4	<0.4	27	8	13	<0.1	4	10	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH114	0-0.2	F: Silty Clay	4	<0.4	19	8	9	<0.1	7	12	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH114 - [LAB_DUP]	0-0.2	F: Silty Clay	4	<0.4	20	8	10	<0.1	6	12	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH115	0.01-0.2	F: Gravelly Clay	<4	<0.4	34	5	5	<0.1	20	10	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH116	0.015-0.45	F: Gravelly Clay	4	<0.4	120	59	3	<0.1	54	23	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH116 - [LAB_DUP]	0.015-0.45	F: Gravelly Clay	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<50	<100	<100	<50	NA	NA	NA	NA	NA
BH116 (Cr VI)	0.015-0.45	F: Gravelly Clay	NA	NA	120	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH116	1.5-1.95	Silty Clay	5	<0.4	46	12	19	<0.1	5	15	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH116	4.5-4.95	Silty Gravelly Clay	25	<0.4	85	98	37	<0.1	21	43	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH117	0.01-0.4	F: Gravelly Clay	10	<0.4	280	110	5	<0.1	130	38	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH117 (Cr VI)	0.01-0.4	F: Gravelly Clay	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH117	0.7-0.95	F: Gravelly Clay	<4	<0.4	31	12	22	<0.1	6	13	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH117 - [LAB_DUP]	0.7-0.95	F: Gravelly Clay	<4	<0.4	37	12	21	<0.1	6	13	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH117	1.6-1.95	Silty Clay	<4	<0.4	18	11	8	<0.1	4	20	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH117	3.0-3.4	Silty Clay	16	<0.4	54	170	17	<0.1	17	65	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH117 - [LAB_DUP]	3.0-3.4	Silty Clay	11	<0.4	23	180	26	<0.1	16	61	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH117 - [TRIPLICATE]	3.0-3.4	Silty Clay	11	<0.4	13	200	14	<0.1	17	71	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH118	0-0.2	F: Silty Clay	<4	<0.4	15	16	16	<0.1	5	21	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH118	0.6-0.8	Silty clay	<4	<0.4	21	12	11	<0.1	6	17	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH119	0-0.2	F: Silty Clay	<4	<0.4	33	26	21	<0.1	8	23	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH119	0.9-1.1	Silty clay	<4	<0.4	38	11	14	<0.1	5	10	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH120	0-0.1	F: Silty Clay	6	<0.4	61	13	18	<0.1	6	13	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH120 - [LAB_DUP]	0-0.1	F: Silty Clay	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH120	0.5-0.75	Silty Clay	5	<0.4	38	15	40	<0.1	6	13	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH121	0-0.1	F: Silty Clay	85	<0.4	31	22	53	<0.1	14	64	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH122	0.03-0.4	F: Gravelly Sand	<4	<0.4	7	40	2	<0.1	2	4	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH122	1.0-1.45	Silty Clay	<4	<0.4	26	9	16	<0.1	4	11	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
SV1	0.5-0.8	F: Silty Sand	9	<0.4	39	15	9	<0.1	12	17	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
SDUP1	BH103 (0-0.2)	F: Silty Clay	5	<0.4	38	35	13	<0.1	10	34	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
SDUP2	BH102 (0-0.2)	F: Silty Clay	<4	<0.4	39	27	14	<0.1	12	52	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	180	230	410	<0.2	<0.5	<1	<1	NA
SDUP101	BH116 (0.015-0.45)	F: Gravelly Clay	10	<0.4	250	93	6	<0.1	110	34	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
SDUP101 (Cr VI)	BH116 (0.015-0.45)	F: Gravelly Clay	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SDUP102	BH116 (4.5-4.95)	Silty Gravelly Clay	17	<0.4	51	66	19	<0.1	15	34	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
SDUP103	BH101 (0-0.1)	F: silty clay	4	<0.4	44	38	16	<0.1	13	40	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
SDUP104	BH122 (0.03-0.4)	F: Gravelly Sand	<4	<0.4	7	62	2	<0.1	1	6	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
SDUP104 - LAB DUP	BH122 (0.03-0.4)	F: Gravelly Sand	NA	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
Total Number of Samples (DSI samples only)			52	51	54	51	51	51	51	51	51	51	39	36	36	37	36	51	52	52	52	52	51	51	51	51	24
Maximum Value (DSI samples only)			120	0.5	280	200	64	0.5	130	100	1.8	0.2	<PQL	<PQL	<PQL	0.3	<PQL	<PQL	<PQL	180	230	410	<PQL	<PQL	<PQL	<PQL	Not Detected
Statistical Analysis on Fill Samples																											
Number of Fill Samples			37	NC	36	NC	36	NC	36	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Mean Value			24	NC	61	NC	25	NC	31	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Standard Deviation			33.9	NC	84.5	NC	43.4	NC	64.4	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
% UCL			95	NC	95	NC	95	NC	95	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
UCL Value			32.09	NC	122.5	NC	40.97	NC	77.68	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

Concentration above the CT1	VALUE
Concentration above SCC1	VALUE
Concentration above the SCC2	VALUE
Concentration above PQL	**Bold**

TABLE S8
SOIL LABORATORY TCLP RESULTS
All data in mg/L unless stated otherwise

			Arsenic	Chromium	Lead	Nickel
PQL - Envirolab Services			0.05	0.01	0.03	0.02
TCLP1 - General Solid Waste			5	5	5	2
TCLP2 - Restricted Solid Waste			20	20	20	8
TCLP3 - Hazardous Waste			>20	>20	>20	>8
Sample Reference	**Sample Depth**	**Sample Description**				
BH1	0.5-0.8	F: Gravelly clayey sand	NA	<0.01	NA	**0.05**
BH3	0.4-0.65	F: Silty clay	NA	NA	**0.08**	NA
BH20	0.5-0.7	F: Gravelly sand	NA	<0.01	NA	**0.06**
BH112	0-0.2	F: Silty Clay	NA	NA	NA	**0.02**
BH112	0.4-0.6	Silty clay	NA	NA	NA	**0.04**
BH113	0-0.1	F: Silty Clay	<0.05	NA	NA	NA
BH116	0.015-0.45	F: Gravelly Clay	NA	<0.01	NA	**0.04**
BH117	0.01-0.4	F: Gravelly Clay	NA	<0.01	NA	**0.03**
SDUP101	BH116 (0.015-0.45)	F: Gravelly Clay	NA	<0.01	NA	**0.02**
Total Number of samples (DSI samples only)			1	3	0	5
Maximum Value (DSI Samples only)			<PQL	<PQL	NA	0.04

General Solid Waste	**VALUE**
Restricted Solid Waste	**VALUE**
Hazardous Waste	**VALUE**
Concentration above PQL	**Bold**

Detailed Site Investigation
3 Osman Street, Blayney, NSW
E35521PT

TABLE Q1
SOIL QA/QC SUMMARY

			TRH C6 - C10	TRH >C10-C16	TRH >C16-C34	TRH >C34-C40	Benzene	Toluene	Ethylbenzene	m+p-xylene	o-Xylene
	PQL Envirolab SYD		25	50	100	100	0.2	0.5	1	2	1
	PQL Envirolab VIC		25	50	100	100	0.2	0.5	1.0	2.0	1.0
Intra	BH103	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1
laboratory	SDUP1	BH103 (0-0.2)	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc
Intra	BH116	0.015-0.45	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1
laboratory	SDUP101	BH116 (0.015-0.45)	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc
Intra	BH101	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1
laboratory	SDUP103	BH101 (0-0.1)	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc
Inter	BH102	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1
laboratory	SDUP2	BH102 (0-0.2)	<25	<50	340	120	<0.2	<0.5	<1	<2	<1
duplicate	MEAN		nc	nc	195	85	nc	nc	nc	nc	nc
	RPD %		nc	nc	149%	82%	nc	nc	nc	nc	nc
Inter	BH116	4.5-4.95	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1
laboratory	SDUP102	BH116 (4.5-4.95)	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc
Inter	BH122	0.03-0.4	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1
laboratory	SDUP104	BH122 (0.03-0.4)	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc
Field	TB1	-	<25	-	-	-	<0.2	<0.5	<1	<2	<1
Blank	22/05/23										
Trip	TS1		-	-	-	-	100%	99%	100%	100%	100%
Spike	22/05/23										
Field	FR-AUGER	µg/L*	39	<50	<100	<100	<1	<1	<1	<2	<1
Rinsate	18/05/23										
Field	FR-S101-SPT	µg/L*	<10	<50	<100	<100	<1	<1	<1	<2	<1
Rinsate	22/05/23										

			Naphthalene	Acenaphthylene	Acenaph-thene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b,j+k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-c,d)pyrene	Dibenzo(a,h)anthra-cene	Benzo(g,h,i)perylene
	PQL Envirolab SYD		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.05	0.1	0.1	0.1
	PQL Envirolab VIC		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1
Intra	BH103	0-0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
laboratory	SDUP1	BH103 (0-0.2)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Intra	BH116	0.015-0.45	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
laboratory	SDUP101	BH116 (0.015-0.45)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Intra	BH101	0-0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
laboratory	SDUP103	BH101 (0-0.1)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Inter	BH102	0-0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
laboratory	SDUP2	BH102 (0-0.2)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Inter	BH116	4.5-4.95	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
laboratory	SDUP102	BH116 (4.5-4.95)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Inter	BH122	0.03-0.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
laboratory	SDUP104	BH122 (0.03-0.4)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Field	TB1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Blank	22/05/23																
Trip	TS1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spike	22/05/23																
Field	FR-AUGER	µg/L*	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1
Rinsate	18/05/23																
Field	FR-S101-SPT	µg/L*	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1
Rinsate	22/05/23																

			HCB	alpha- BHC	gamma- BHC	beta- BHC	Heptachlor	delta- BHC	Aldrin	Heptachlor Epoxide	Gamma- Chlordane	alpha- chlordane	Endosulfan I	pp- DDE	Dieldrin	Endrin	pp- DDD	Endosulfan II	pp- DDT	Endrin Aldehyde	Endosulfan Sulphate	Methoxychlor
	PQL Envirolab SYD		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	0.1	0.1	0.1
	PQL Envirolab VIC		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	0.1	0.1	0.1
Intra	BH103	0-0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
laboratory	SDUP1	BH103 (0-0.2)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Intra	BH116	0.015-0.45	<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	<0.1	<0.1	<0.1
laboratory	SDUP101	BH116 (0.015-0.45)	<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	<0.1	<0.1	<0.1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Intra	BH101	0-0.1	<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	<0.1	<0.1	<0.1	<0.1
laboratory	SDUP103	BH101 (0-0.1)	<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	<0.1	<0.1	<0.1	<0.1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Inter	BH102	0-0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
laboratory	SDUP2	BH102 (0-0.2)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Inter	BH116	4.5-4.95	<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	<0.1	<0.1	<0.1
laboratory	SDUP102	BH116 (4.5-4.95)	<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	<0.1	<0.1	<0.1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Inter	BH122	0.03-0.4	<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	<0.1	<0.1	<0.1
laboratory	SDUP104	BH122 (0.03-0.4)	<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	<0.1	<0.1	<0.1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Field	TB1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Blank	22/05/23																					
Trip	TS1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spike	22/05/23																					
Field	FR-AUGER	µg/L*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rinsate	18/05/23																					
Field	FR-S101-SPT	µg/L*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rinsate	22/05/23																					

			Azinphos-methyl (Guthion)	Bromophos-ethyl	Chlorpyriphos	Chlorpyriphos-methyl	Diazinon	Dichlorvos	Dimethoate	Ethion	Fenitrothion	Malathion	Parathion	Ronnel	Total PCBS
	PQL Envirolab SYD		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
	PQL Envirolab VIC		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
Intra	BH103	0-0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
laboratory	SDUP1	BH103 (0-0.2)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Intra	BH116	0.015-0.45	<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
laboratory	SDUP101	BH116 (0.015-0.45)	<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
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Intra	BH101	0-0.1	<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
laboratory	SDUP103	BH101 (0-0.1)	<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
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Inter	BH102	0-0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
laboratory	SDUP2	BH102 (0-0.2)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Inter	BH116	4.5-4.95	<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
laboratory	SDUP102	BH116 (4.5-4.95)	<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
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Inter	BH122	0.03-0.4	<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
laboratory	SDUP104	BH122 (0.03-0.4)	<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
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Field	TB1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Blank	22/05/23														
Trip	TS1		-	-	-	-	-	-	-	-	-	-	-	-	-
Spike	22/05/23														
Field	FR-AUGER	µg/L*	-	-	-	-	-	-	-	-	-	-	-	-	-
Rinsate	18/05/23														
Field	FR-S101-SPT	µg/L*	-	-	-	-	-	-	-	-	-	-	-	-	-
Rinsate	22/05/23														

			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
	PQL Envirolab SYD		4	0.4	1	1	1	0.1	1	1
	PQL Envirolab VIC		4.0	0.4	1.0	1.0	1.0	0.1	1.0	1.0
Intra	BH103	0-0.2	4	<0.4	51	30	16	<0.1	14	32
laboratory	SDUP1	BH103 (0-0.2)	5	<0.4	38	35	13	<0.1	10	34
duplicate	MEAN		4.5	nc	44.5	32.5	14.5	nc	12	33
	RPD %		22%	nc	29%	15%	21%	nc	33%	6%
Intra	BH116	0.015-0.45	4	<0.4	120	59	3	<0.1	54	23
laboratory	SDUP101	BH116 (0.015-0.45)	10	<0.4	250	93	6	<0.1	110	34
duplicate	MEAN		7	nc	185	76	4.5	nc	82	28.5
	RPD %		86%	nc	70%	45%	67%	nc	68%	39%
Intra	BH101	0-0.1	7	<0.4	59	37	26	0.1	13	47
laboratory	SDUP103	BH101 (0-0.1)	4	<0.4	44	38	16	<0.1	13	40
duplicate	MEAN		5.5	nc	51.5	37.5	21	0.075	13	43.5
	RPD %		55%	nc	29%	3%	48%	67%	0%	16%
Inter	BH102	0-0.2	<4	<0.4	35	28	13	<0.1	11	38
laboratory	SDUP2	BH102 (0-0.2)	<4	<0.4	39	27	14	<0.1	12	52
duplicate	MEAN		nc	nc	37	27.5	13.5	nc	11.5	45
	RPD %		nc	nc	11%	4%	7%	nc	9%	31%
Inter	BH116	4.5-4.95	25	<0.4	85	98	37	<0.1	21	43
laboratory	SDUP102	BH116 (4.5-4.95)	17	<0.4	51	66	19	<0.1	15	34
duplicate	MEAN		21	nc	68	82	28	nc	18	38.5
	RPD %		38%	nc	50%	39%	64%	nc	33%	23%
Inter	BH122	0.03-0.4	<4	<0.4	7	40	2	<0.1	2	4
laboratory	SDUP104	BH122 (0.03-0.4)	<4	<0.4	7	62	2	<0.1	1	6
duplicate	MEAN		nc	nc	7	51	2	nc	1.5	5
	RPD %		nc	nc	0%	43%	0%	nc	67%	40%
Field	TB1	-	-	-	-	-	-	-	-	-
Blank	22/05/23									
Trip	TS1		-	-	-	-	-	-	-	-
Spike	22/05/23									
Field	FR-AUGER	µg/L*	<0.05	<0.01	<0.01	0.7	<0.03	<0.0005	<0.02	<0.02
Rinsate	18/05/23									
Field	FR-S101-SPT	µg/L*	<0.05	<0.01	<0.01	0.07	<0.03	<0.0005	<0.02	<0.02
Rinsate	22/05/23									

Result outside of QA/QC acceptance criteria
* All rinstae results reported in µg/L, with the exception of metals whih are reported in mg/L

ABBREVIATIONS AND EXPLANATIONS

Abbreviations used in the Tables:

NA:	Not Analysed
NC or nc:	Not Calculated
NEPM:	National Environmental Protection Measure
NL:	Not Limiting
NSL:	No Set Limit
ppm:	Parts per million
PAHs	Polycyclic Aromatic Hydrocarbons
PQL:	Practical Quantitation Limit
TRH:	Total Recoverable Hydrocarbons
USEPA	United States Environmental Protection Agency
VOC:	Volatile Organic Compounds
RPD:	Relative Percentage Difference

TABLE SV1
SOIL VAPOUR LABORATORY RESULTS
All results in ug/m3 unless stated otherwise.

	SAC	SAC	SAMPLES			
	USEPA**	NEPM (2013)	SV1	SV1 LAB DUP	SV2	SVDUP1 SV1
Total Petroleum Hydrocarbons (TPH)						
TPH F1	See NEPM	180,000	<200	<200	<200	<200
TPH F2	See NEPM	130,000	**130**	**120**	**210**	**100**
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)						
Benzene	See NEPM	1,000	**190**	**190**	**6**	**190**
Toluene	See NEPM	130,000	**99**	**100**	**70**	**100**
Ethylbenzene	See NEPM	33,000	**10**	**10**	**10**	**10**
Xylenes	See NEPM	22,000	**40**	**40**	**60**	**50**
Polycyclic Aromatic Hydrocarbons (PAHs)						
Naphthalene	See NEPM	800	<2.6	<2.6	<2.6	<2.6
Volatile Organic Compounds (VOCs), including chlorinated VOCs #						
Vinyl Chloride	See NEPM	30	<1.3	<1.3	<1.3	<1.3
Cis-1,2-dichloroethene	See NEPM	80	<2	<2	<2	<2
Trichloroethene (TCE)	See NEPM	20	<2.7	<2.7	<2.7	<2.7
Tetrachloroethene (PCE)	See NEPM	2,000	<3.4	<3.4	<3.4	<3.4
1,1,1-Trichloroethane	See NEPM	60,000	<2.7	<2.7	<2.7	<2.7
Acetone	NSL	NSL	**150**	**150**	<11.9	**150**
Bromodichloromethane	25.3	NSL	**20**	**20**	**20**	**30**
1,3-Butadiene	31.2	NSL	**87**	**90**	**13**	**91**
Carbon Disulfide	24,300	NSL	**20**	**20**	<16	**20**
Chloroform	40.7	NSL	**250**	**250**	**250**	**250**
Chloromethane	3,130	NSL	**7**	**7**	<1	**8**
Cyclohexane	209,000	NSL	**2**	**2**	<1.7	**2**
4-ethyl toluene	NSL	NSL	**4**	**4**	**5**	**4**
Ethanol	NSL	NSL	**40**	**40**	**40**	**30**
Heptane	13,900	NSL	**20**	**20**	**7**	**20**
Hexane	24,300	NSL	**24**	**24**	**20**	**25**
Isopropyl Alcohol	6,950	NSL	**10**	**10**	<12	<12
MEK	174,000	NSL	**23**	**23**	<15	**20**
Propylene	104,000	NSL	**320**	**330**	**240**	**350**
Styrene	34,800	NSL	**5**	**5**	**2**	**3**
Trichlorofluoromethane(Freon 11)	NSL	NSL	<2.8	<2.8	**10**	<2.8
1,2,4-Trimethylbenzene	2,090	NSL	**10**	**10**	**20**	**20**
1,3,5-Trimethylbenzene	2,090	NSL	**6**	**7**	**6**	**7**
1,4-Dichlorobenzene	85.1	NSL	**7**	**7**	**10**	**7**

Concentration above the VAC	Value
Concentration above the PQL	**Bold**

* No limit established as this is a tracer compound used for QA
** Target Sub-Slab and Near-source Soil Gas Concentration (TCR=1E-05 or THQ=1), groundwater temperature 20 degrees Celcius
# VOC data has only been tabulated for key compounds in NEPM 2013 Schedule B1 and others that were detected >PQL

TABLE Q3
SOIL VAPOUR QA/QC SUMMARY
All results in ug/m3 unless stated otherwise.

	Intra-laboratory Duplicate		
	SV1	SVDUP1	RPD %
Total Recoverable Hydrocarbons (TRH)			
TRH F1	<200	<200	NC
TRH F2	**130**	**100**	**27**
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)			
Benzene	**190**	**190**	0
Toluene	**99**	**100**	**1**
Ethylbenzene	**10**	**10**	0
m,p-Xylene	**30**	**10**	**100**
o-Xylene	**30**	**20**	**40**
Polycyclic Aromatic Hydrocarbons (PAHs)			
Naphthalene	<2.6	<2.6	NC
Volatile Organic Compounds (VOCs), including chlorinated VOCs #			
Vinyl Chloride	<1.3	<1.3	NC
Cis-1,2-dichloroethene	<2	<2	NC
Trichloroethene (TCE)	<2.7	<2.7	NC
Tetrachloroethene (PCE)	<3.4	<3.4	NC
1,1,1-Trichloroethane	<2.7	<2.7	NC
Acetone	**150**	**150**	0
Bromodichloromethane	**20**	**30**	**40**
1,3-Butadiene	**87**	**91**	**4**
Carbon Disulfide	**20**	**20**	0
Chloroform	**250**	**250**	0
Chloromethane	**7**	**8**	**13**
Cyclohexane	**2**	**2**	0
4-ethyl toluene	**4**	**4**	0
Ethanol	**40**	**30**	**29**
Heptane	**20**	**20**	0
Hexane	**24**	**25**	**4**
Isopropyl Alcohol	**10**	<12	**18**
MEK	**23**	**20**	**14**
Propylene	**320**	**350**	**9**
Styrene	**5**	**3**	**50**
1,2,4-Trimethylbenzene	**10**	**20**	**67**
1,3,5-Trimethylbenzene	**6**	**7**	**15**
1,4-Dichlorobenzene	**7**	**7**	0

Exceedance of QA/QC criteria **Value**

** Target Sub-Slab and Near-source Soil Gas Concentration (TCR=1E-05 or THQ=1)
# VOC data has only been tabulated for compounds with detection above the PQLs

Shroud Leak Test	Isopropanol (Shroud) - From SV1	Isopropanol SV1 concentration
Isopropanol (ug/m3)	260000	10

Result outside of QA/QC acceptance criteria Value

ABBREVIATIONS AND EXPLANATIONS

Abbreviations used in the Tables:

ADWG:	AustralianDrinking Water Guidelines
ANZG	Australian and New Zealand Guidelines
B(a)P:	Benzo(a)pyrene
CRC:	Cooperative Research Centre
ESLs:	Ecological Screening Levels
GIL:	Groundwater Investigation Levels
HILs:	Health Investigation Levels
HSLs:	Health Screening Levels
HSL-SSA:	Health Screening Level-SiteSpecific Assessment
NA:	Not Analysed
NC:	Not Calculated
NEPM:	National Environmental Protection Measure
NHMRC:	National Health and Medical Research Council
NL:	Not Limiting
NSL:	No Set Limit
OCP:	Organochlorine Pesticides
OPP:	Organophosphorus Pesticides
PAHs:	Polycyclic Aromatic Hydrocarbons
ppm:	Parts per million
PCBs:	Polychlorinated Biphenyls
PCE:	Perchloroethylene (Tetrachloroethylene or Tetrachloroethene)
PQL:	Practical Quantitation Limit
RS:	Rinsate Sample
RSL:	Regional Screening Levels
SAC:	Site Assessment Criteria
SSA:	Site Specific Assessment
SSHSLs:	Site Specific Health Screening Levels
TB:	Trip Blank
TCA:	1,1,1 Trichloroethane (methyl chloroform)
TCE:	Trichloroethylene (Trichloroethene)
TS:	Trip Spike
TRH:	Total Recoverable Hydrocarbons
UCL:	Upper Level Confidence Limit on Mean Value
USEPA	United States Environmental Protection Agency
VOCC:	Volatile Organic Chlorinated Compounds
WHO:	World Health Organisation

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TABLE G1
SUMMARY OF GROUNDWATER LABORATORY RESULTS COMPARED TO ECOLOGICAL GILs SAC
All results in µg/L unless stated otherwise.

	PQL Envirolab Services	ANZG 2018 Fresh Waters	PSI SAMPLES							DSI SAMPLES									
			MW1	MW1 LAB DUP	MW12	MW15	WDUP1	WDUP2	WDUP2	MW12	MW12 - LAB DUP	MW14	MW15	MW101	MW116	MW117	WDUP1	WDUP2	WDUP2 - LAB DUP
Inorganic Compounds and Parameters																			
pH		6.5 - 8.5	6.8	NA	7.1	6.4	NA	NA	NA	6.7	6.7	7.1	6	6.6	6.1	6.1	NA	NA	NA
Electrical Conductivity (µS/cm)	1	NSL	**210**	NA	**1200**	**340**	NA	NA	NA	**1100**	**1100**	**1600**	**360**	**1900**	**220**	**230**	NA	NA	NA
Metals and Metalloids																			
Arsenic (As III)	1	24	<1	<1	<1	<1	<1	<1	NA	<1	<1	<1	<1	**1**	**1**	<1	<1	**1**	**1**
Cadmium	0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium (SAC for Cr III adopted)	1	3.3	<1	<1	<1	<1	<1	<1	NA	**1**	**1**	<1	<1	**2**	**4**	<1	<1	**4**	**4**
Copper	1	1.4	<1	<1	<1	<1	<1	<1	NA	**1**	**1**	<1	<1	<1	<1	**1**	<1	<1	<1
Lead	1	3.4	<1	<1	<1	<1	<1	<1	NA	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Total Mercury (inorganic)	0.05	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	NA	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel	1	11	**2**	**2**	<1	**3**	**3**	**2**	NA	<1	<1	<1	**2**	**3**	**2**	**1**	**1**	**2**	**2**
Zinc	1	8	**25**	**25**	**15**	**29**	**29**	**25**	NA	**2**	**2**	**7**	**6**	**20**	**26**	**19**	**18**	**27**	**27**
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)																			
Benzene	1	950	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Toluene	1	180	<1	<1	<1	<1	<1	<1	<1	**1**	**1**	<1	<1	<1	<1	<1	<1	<1	NA
Ethylbenzene	1	80	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
m+p-xylene	2	75	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	NA
o-xylene	1	350	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Total xylenes	2	NSL	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	NA
Volatile Organic Compounds (VOCs), including chlorinated VOCs																			
Dichlorodifluoromethane	10	NSL	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
Chloromethane	10	NSL	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
Vinyl Chloride	10	100	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
Bromomethane	10	NSL	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
Chloroethane	10	NSL	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
Trichlorofluoromethane	10	NSL	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
1,1-Dichloroethene	1	700	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Trans-1,2-dichloroethene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1-dichloroethane	1	90	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Cis-1,2-dichloroethene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Bromochloromethane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Chloroform	1	370	**12**	**10**	<1	<1	<1	**11**	**12**	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
2,2-dichloropropane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2-dichloroethane	1	1900	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1,1-trichloroethane	1	270	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1-dichloropropene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Cyclohexane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Carbon tetrachloride	1	240	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Benzene	1	950	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Dibromomethane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2-dichloropropane	1	900	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Trichloroethene	1	330	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Bromodichloromethane	1	NSL	**3**	**2**	<1	<1	<1	**2**	**2**	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
trans-1,3-dichloropropene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
cis-1,3-dichloropropene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1,2-trichloroethane	1	6500	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Toluene	1	180	<1	<1	<1	<1	<1	<1	<1	**1**	**1**	<1	<1	<1	<1	<1	<1	<1	NA
1,3-dichloropropane	1	1100	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Dibromochloromethane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2-dibromoethane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Tetrachloroethene	1	70	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1,1,2-tetrachloroethane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Chlorobenzene	1	55	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Ethylbenzene	1	80	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Bromoform	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
m+p-xylene	2	75	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	NA
Styrene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1,2,2-tetrachloroethane	1	400	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
o-xylene	1	350	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2,3-trichloropropane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Isopropylbenzene	1	30	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Bromobenzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
n-propyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
2-chlorotoluene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
4-chlorotoluene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,3,5-trimethyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Tert-butyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2,4-trimethyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,3-dichlorobenzene	1	260	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Sec-butyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,4-dichlorobenzene	1	60	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
4-isopropyl toluene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2-dichlorobenzene	1	160	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
n-butyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2-dibromo-3-chloropropane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2,4-trichlorobenzene	1	85	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Hexachlorobutadiene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2,3-trichlorobenzene	1	3	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Polycyclic Aromatic Hydrocarbons (PAHs)																			
Naphthalene	0.2	16	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	NA	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	NA
Acenaphthylene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Acenaphthene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Fluorene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Phenanthrene	0.1	0.6	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Anthracene	0.1	0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Fluoranthene	0.1	1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Pyrene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Benzo(a)anthracene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Chrysene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Benzo(b,j+k)fluoranthene	0.2	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	NA	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	NA
Benzo(a)pyrene	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Indeno(1,2,3-c,d)pyrene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Dibenzo(a,h)anthracene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Benzo(g,h,i)perylene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA

Concentration above the SAC	VALUE
Concentration above the PQL	**Bold**
GIL >PQL	Red

TABLE G2
SUMMARY OF GROUNDWATER LABORATORY RESULTS COMPARED TO HUMAN CONTACT GILs
All results in µg/L unless stated otherwise.

	PQL Envirolab Services	Recreational (10 x NHMRC ADWG)	PSI SAMPLES							DSI SAMPLES									
			MW1	MW1 LAB DUP	MW12	MW15	WDUP1	WDUP2	WDUP2	MW12	MW12 - LAB DUP	MW14	MW15	MW101	MW116	MW117	WDUP1	WDUP2	WDUP2 - LAB DUP
Inorganic Compounds and Parameters																			
pH		6.5 - 8.5	6.8	NA	7.1	6.4	NA	NA	NA	6.7	6.7	7.1	6	6.6	6.1	6.1	NA	NA	NA
Electrical Conductivity (µS/cm)	1	NSL	**210**	NA	**1200**	**340**	NA	NA	NA	**1100**	**1100**	**1600**	**360**	**1900**	**220**	**230**	NA	NA	NA
Metals and Metalloids																			
Arsenic (As III)	1	100	<1	<1	<1	<1	<1	<1	NA	<1	<1	<1	<1	**1**	**1**	<1	<1	**1**	**1**
Cadmium	0.1	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium (total)	1	500	<1	<1	<1	<1	<1	<1	NA	**1**	**1**	<1	<1	**2**	**4**	<1	<1	**4**	**4**
Copper	1	20000	<1	<1	<1	<1	<1	<1	NA	**1**	**1**	<1	<1	<1	<1	**1**	<1	<1	<1
Lead	1	100	<1	<1	<1	<1	<1	<1	NA	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Total Mercury (inorganic)	0.05	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	NA	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel	1	200	**2**	**2**	<1	**3**	**3**	**2**	NA	<1	<1	<1	**2**	**3**	**2**	**1**	**1**	**2**	**2**
Zinc	1	30000	**25**	**25**	**15**	**29**	**29**	**25**	NA	**2**	**2**	**7**	**6**	**20**	**26**	**19**	**18**	**27**	**27**
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)																			
Benzene	1	10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Toluene	1	8000	<1	<1	<1	<1	<1	<1	<1	**1**	**1**	<1	<1	<1	<1	<1	<1	<1	NA
Ethylbenzene	1	3000	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
m+p-xylene	2	NSL	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	NA
o-xylene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Total xylenes	2	6000	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	NA
Volatile Organic Compounds (VOCs), including chlorinated VOCs																			
Dichlorodifluoromethane	10	NSL	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
Chloromethane	10	NSL	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
Vinyl Chloride	10	3	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
Bromomethane	10	NSL	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
Chloroethane	10	NSL	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
Trichlorofluoromethane	10	NSL	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
1,1-Dichloroethene	1	300	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Trans-1,2-dichloroethene	1	600	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1-dichloroethane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Cis-1,2-dichloroethene	1	600	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Bromochloromethane	1	2500	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Chloroform	1		**12**	**10**	<1	<1	<1	**11**	**12**	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
2,2-dichloropropane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2-dichloroethane	1	30	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1,1-trichloroethane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1-dichloropropene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Cyclohexane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Carbon tetrachloride	1	30	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Benzene	1	10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Dibromomethane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2-dichloropropane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Trichloroethene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Bromodichloromethane	1	NSL	**3**	**2**	<1	<1	<1	**2**	**2**	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
trans-1,3-dichloropropene	1	1000	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
cis-1,3-dichloropropene	1	1000	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1,2-trichloroethane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Toluene	1	8000	<1	<1	<1	<1	<1	<1	<1	**1**	**1**	<1	<1	<1	<1	<1	<1	<1	NA
1,3-dichloropropane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Dibromochloromethane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2-dibromoethane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Tetrachloroethene	1	500	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1,1,2-tetrachloroethane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Chlorobenzene	1	3000	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Ethylbenzene	1	3000	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Bromoform	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
m+p-xylene	2	NSL	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	NA
Styrene	1	300	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1,2,2-tetrachloroethane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
o-xylene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2,3-trichloropropane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Isopropylbenzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Bromobenzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
n-propyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
2-chlorotoluene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
4-chlorotoluene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,3,5-trimethyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Tert-butyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2,4-trimethyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,3-dichlorobenzene	1	200	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Sec-butyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,4-dichlorobenzene	1	400	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
4-isopropyl toluene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2-dichlorobenzene	1	15000	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
n-butyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2-dibromo-3-chloropropane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2,4-trichlorobenzene	1	300	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2,3-trichlorobenzene	1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Hexachlorobutadiene	1	7	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Polycyclic Aromatic Hydrocarbons (PAHs)																			
Naphthalene	0.2	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	NA	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	NA
Acenaphthylene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Acenaphthene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Fluorene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Phenanthrene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Anthracene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Fluoranthene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Pyrene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Benzo(a)anthracene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Chrysene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Benzo(b,j+k)fluoranthene	0.2	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	NA	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	NA
Benzo(a)pyrene	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Indeno(1,2,3-c,d)pyrene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Dibenzo(a,h)anthracene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Benzo(g,h,i)perylene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA

Concentration above the SAC	VALUE
Concentration above the PQL	**Bold**
GIL >PQL	Red

TABLE G3
SUMMARY OF GROUNDWATER LABORATORY RESULTS COMPARED TO DRINKING WATER GILs
All results in µg/L unless stated otherwise.

	PQL Envirolab Services	NHMRC ADWG 2011	PSI SAMPLES							DSI SAMPLES									
			MW1	MW1 LAB DUP	MW12	MW15	WDUP1	WDUP2	WDUP2	MW12	MW12 - LAB DUP	MW14	MW15	MW101	MW116	MW117	WDUP1	WDUP2	WDUP2 - LAB DUP
Inorganic Compounds and Parameters																			
pH		6.5 - 8.5	6.8	NA	7.1	6.4	NA	NA	NA	6.7	6.7	7.1	6	6.6	6.1	6.1	NA	NA	NA
Electrical Conductivity (µS/cm)	1	NSL	**210**	NA	**1200**	**340**	NA	NA	NA	**1100**	**1100**	**1600**	**360**	**1900**	**220**	**230**	NA	NA	NA
Metals and Metalloids																			
Arsenic (As III)	1	10	<1	<1	<1	<1	<1	<1	NA	<1	<1	<1	<1	**1**	**1**	<1	<1	**1**	**1**
Cadmium	0.1	2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium (total)	1	50	<1	<1	<1	<1	<1	<1	NA	**1**	**1**	<1	<1	**2**	**4**	<1	<1	**4**	**4**
Copper	1	2000	<1	<1	<1	<1	<1	<1	NA	**1**	**1**	<1	<1	<1	<1	**1**	<1	<1	<1
Lead	1	10	<1	<1	<1	<1	<1	<1	NA	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Total Mercury (inorganic)	0.05	1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	NA	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel	1	20	**2**	**2**	<1	**3**	**3**	**2**	NA	<1	<1	<1	**2**	**3**	**2**	**1**	**1**	**2**	**2**
Zinc	1	3000	**25**	**25**	**15**	**29**	**29**	**25**	NA	**2**	**2**	**7**	**6**	**20**	**26**	**19**	**18**	**27**	**27**
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)																			
Benzene	1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Toluene	1	800	<1	<1	<1	<1	<1	<1	<1	**1**	**1**	<1	<1	<1	<1	<1	<1	<1	NA
Ethylbenzene	1	300	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
m+p-xylene	2	NSL	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	NA
o-xylene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Total xylenes	2	600	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	NA
Volatile Organic Compounds (VOCs), including chlo	1																		
Dichlorodifluoromethane	10	NSL	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
Chloromethane	10	NSL	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
Vinyl Chloride	10	0.3	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
Bromomethane	10	NSL	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
Chloroethane	10	NSL	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
Trichlorofluoromethane	10	NSL	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
1,1-Dichloroethene	1	30	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Trans-1,2-dichloroethene	1	60	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1-dichloroethane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Cis-1,2-dichloroethene	1	60	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Bromochloromethane	1	250	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Chloroform	1		**12**	**10**	<1	<1	<1	**11**	**12**	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
2,2-dichloropropane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2-dichloroethane	1	3	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1,1-trichloroethane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1-dichloropropene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Cyclohexane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Carbon tetrachloride	1	3	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Benzene	1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Dibromomethane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2-dichloropropane	2	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Trichloroethene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Bromodichloromethane	2	NSL	**3**	**2**	<1	<1	<1	**2**	**2**	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
trans-1,3-dichloropropene	1	100	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
cis-1,3-dichloropropene	1	100	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1,2-trichloroethane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Toluene	1	800	<1	<1	<1	<1	<1	<1	<1	**1**	**1**	<1	<1	<1	<1	<1	<1	<1	NA
1,3-dichloropropane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Dibromochloromethane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2-dibromoethane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Tetrachloroethene	1	50	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1,1,2-tetrachloroethane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Chlorobenzene	1	300	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Ethylbenzene	1	300	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Bromoform	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
m+p-xylene	2	NSL	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	NA
Styrene	1	30	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1,2,2-tetrachloroethane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
o-xylene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2,3-trichloropropane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Isopropylbenzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Bromobenzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
n-propyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
2-chlorotoluene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
4-chlorotoluene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,3,5-trimethyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Tert-butyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2,4-trimethyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,3-dichlorobenzene	1	20	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Sec-butyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,4-dichlorobenzene	1	40	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
4-isopropyl toluene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2-dichlorobenzene	1	1500	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
n-butyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2-dibromo-3-chloropropane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2,4-trichlorobenzene	1	30	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2,3-trichlorobenzene	1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Hexachlorobutadiene	1	0.07	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Polycyclic Aromatic Hydrocarbons (PAHs)																			
Naphthalene	0.2	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	NA	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	NA
Acenaphthylene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Acenaphthene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Fluorene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Phenanthrene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Anthracene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Fluoranthene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Pyrene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Benzo(a)anthracene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Chrysene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Benzo(b,j+k)fluoranthene	0.2	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	NA	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	NA
Benzo(a)pyrene	0.1	0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Indeno(1,2,3-c,d)pyrene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Dibenzo(a,h)anthracene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Benzo(g,h,i)perylene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA

Concentration above the SAC	VALUE
Concentration above the PQL	**Bold**
GIL >PQL	Red

TABLE G4
GROUNDWATER LABORATORY RESULTS COMPARED TO HSLs
All data in µg/L unless stated otherwise

				C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	PID
PQL - Envirolab Services				10	50	1	1	1	2	1	
NEPM 2013 - Land Use Category				**HSL-A/B: LOW/HIGH DENSITY RESIDENTIAL**							
Sample Reference	**Water Depth**	**Depth Category**	**Soil Category**								
MW1	4.38	4m to <8m	Sand	<10	**120**	<1	<1	<1	<2	<1	1
MW1	4.38	4m to <8m	Sand	<10	**120**	<1	<1	<1	<2	<1	1
MW12	3.43	2m to <4m	Sand	<10	<50	<1	<1	<1	<2	<1	0.5
MW15	0.81	0m to <2m	Sand	<10	<50	<1	<1	<1	<2	<1	0.5
WDUP1	0.81	0m to <2m	Sand	<10	<50	<1	<1	<1	<2	<1	NA
WDUP2	4.38	4m to <8m	Sand	**13**	**120**	<1	<1	<1	<2	<1	NA
WDUP2	4.38	4m to <8m	Sand	**16**	NA	<1	<1	<1	<2	<1	NA
MW12	3.6	2m to <4m	Sand	<10	<50	<1	**1**	<1	<2	<1	0.2
MW12 - LAB DUP	3.6	2m to <4m	Sand	<10	<50	<1	**1**	<1	<2	<1	0.2
MW14	3	2m to <4m	Sand	<10	<50	<1	<1	<1	<2	<1	0.1
MW15	2.48	2m to <4m	Sand	<10	<50	<1	<1	<1	<2	<1	0
MW101	4.28	4m to <8m	Sand	<10	<50	<1	<1	<1	<2	<1	1.2
MW116	3.16	2m to <4m	Sand	<10	**54**	<1	<1	<1	<2	<1	1.4
MW117	2.81	2m to <4m	Sand	<10	<50	<1	<1	<1	<2	<1	0.7
WDUP1	2.81	2m to <4m	Sand	<10	<50	<1	<1	<1	<2	<1	NA
WDUP2	3.16	2m to <4m	Sand	<10	<50	<1	<1	<1	<2	<1	NA
WDUP2 - LAB DUP	3.16	2m to <4m	Sand	NA	NA	NA	NA	NA	NA	NA	NA
Total Number of Samples				9	9	9	9	9	9	9	7
Maximum Value				<PQL	54	<PQL	1	<PQL	<PQL	<PQL	1.4

Concentration above the SAC	**VALUE**
Site specific assesment (SSA) required	**VALUE**
Concentration above the PQL	**Bold**

The guideline corresponding to the elevated value is highlighted in grey in the Groundwater Assessment Criteria Table below

HSL GROUNDWATER ASSESSMENT CRITERIA

Sample Reference	**Water Depth**	**Depth Category**	**Soil Category**	C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene
MW1	4.38	4m to <8m	Sand	1000	1000	800	NL	NL	NL	NL
MW1	4.38	4m to <8m	Sand	1000	1000	800	NL	NL	NL	NL
MW12	3.43	2m to <4m	Sand	1000	1000	800	NL	NL	NL	NL
MW15	0.81	0m to <2m	Sand	SSA	SSA	SSA	SSA	SSA	SSA	SSA
WDUP1	0.81	0m to <2m	Sand	SSA	SSA	SSA	SSA	SSA	SSA	SSA
WDUP2	4.38	4m to <8m	Sand	1000	1000	800	NL	NL	NL	NL
WDUP2	4.38	4m to <8m	Sand	1000	NA	800	NL	NL	NL	NL
MW12	3.6	2m to <4m	Sand	1000	1000	800	NL	NL	NL	NL
MW12 - LAB DUP	3.6	2m to <4m	Sand	1000	1000	800	NL	NL	NL	NL
MW14	3	2m to <4m	Sand	1000	1000	800	NL	NL	NL	NL
MW15	2.48	2m to <4m	Sand	1000	1000	800	NL	NL	NL	NL
MW101	4.28	4m to <8m	Sand	1000	1000	800	NL	NL	NL	NL
MW116	3.16	2m to <4m	Sand	1000	1000	800	NL	NL	NL	NL
MW117	2.81	2m to <4m	Sand	1000	1000	800	NL	NL	NL	NL
WDUP1	2.81	2m to <4m	Sand	1000	1000	800	NL	NL	NL	NL
WDUP2	3.16	2m to <4m	Sand	1000	1000	800	NL	NL	NL	NL
WDUP2 - LAB DUP	3.16	2m to <4m	Sand	NA	NA	NA	NA	NA	NA	NA

JKEnvironments

TABLE G5
GROUNDWATER LABORATORY RESULTS COMPARED TO SITE SPECIFIC HSLs - RISK ASSESSMENT
All results in µg/L unless stated otherwise.

	PQL Envirolab Services	NHMRC ADWG 2011	WHO 2008	USEPA RSL Tapwater 2017	PSI SAMPLES							DSI SAMPLES									
					MW1	MW1 LAB DUP	MW12	MW15	WDUP1	WDUP2	WDUP2 LAB DUP	MW12	MW12 - LAB DUP	MW14	MW15	MW101	MW116	MW117	WDUP1	WDUP2	WDUP2 - LAB DUP
Total Recoverable Hydrocarbons (TRH)																					
C_6-C_9 Aliphatics (assessed using F1)	10	-	100	-	<10	<10	<10	<10	<10	**13**	**16**	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
>C_9-C_{14} Aliphatics (assessed using F2)	50	-	100	-	**120**	**120**	<50	<50	<50	**120**	NA	<50	<50	<50	<50	<50	**54**	<50	<50	<50	NA
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)																					
Benzene	1	1	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Toluene	1	800	-	-	<1	<1	<1	<1	<1	<1	<1	**1**	**1**	<1	<1	<1	<1	<1	<1	<1	NA
Ethylbenzene	1	300	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Total xylenes	2	600	-	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	NA
Polycyclic Aromatic Hydrocarbons (PAHs)																					
Naphthalene	1	-	-	6.1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Volatile Organic Compounds (VOCs), including chlorinated VOCs																					
Dichlorodifluoromethane	10	-	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
Chloromethane	10	-	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
Vinyl Chloride	10	0.3	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
Bromomethane	10	-	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
Chloroethane	10	-	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
Trichlorofluoromethane	10	-	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
1,1-Dichloroethene	1	30	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Trans-1,2-dichloroethene	1	60	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1-dichloroethane	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Cis-1,2-dichloroethene	1	60	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Bromochloromethane	1	250	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Chloroform	1		-	-	**12**	**10**	<1	<1	<1	**11**	**12**	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
2,2-dichloropropane	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2-dichloroethane	1	3	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1,1-trichloroethane	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1-dichloropropene	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Cyclohexane	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Carbon tetrachloride	1	3	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Benzene	1	1	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Dibromomethane	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2-dichloropropane	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Trichloroethene	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Bromodichloromethane	1	-	-	-	**3**	**2**	<1	<1	<1	**2**	**2**	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
trans-1,3-dichloropropene	1	100	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
cis-1,3-dichloropropene	1	100	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1,2-trichloroethane	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Toluene	1	800	-	-	<1	<1	<1	<1	<1	<1	<1	**1**	**1**	<1	<1	<1	<1	<1	<1	<1	NA
1,3-dichloropropane	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Dibromochloromethane	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2-dibromoethane	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Tetrachloroethene	1	50	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1,1,2-tetrachloroethane	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Chlorobenzene	1	300	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Ethylbenzene	1	300	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Bromoform	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
m+p-xylene	2	-	-	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	NA
Styrene	1	30	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1,2,2-tetrachloroethane	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
o-xylene	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2,3-trichloropropane	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Isopropylbenzene	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Bromobenzene	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
n-propyl benzene	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
2-chlorotoluene	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
4-chlorotoluene	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,3,5-trimethyl benzene	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Tert-butyl benzene	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2,4-trimethyl benzene	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,3-dichlorobenzene	1	20	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Sec-butyl benzene	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,4-dichlorobenzene	1	40	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
4-isopropyl toluene	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2-dichlorobenzene	1	1500	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
n-butyl benzene	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2-dibromo-3-chloropropane	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2,4-trichlorobenzene	1	30	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2,3-trichlorobenzene	1		-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Hexachlorobutadiene	1	0.07	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA

Concentration above the SAC	VALUE
Concentration above the PQL	**Bold**
GIL >PQL	Red

Detailed Site Investigation
3 Osman Street, Blayney, NSW
E35521PT

TABLE Q3
GROUNDWATER QA/QC SUMMARY

		Dichlorodifluoromethane	Chloromethane	Vinyl Chloride	Bromomethane	Chloroethane	Trichlorofluoromethane	1,1-Dichloroethene	Trans-1,2-dichloroethene	1,1-dichloroethane	Cis-1,2-dichloroethene	Bromochloromethane	Chloroform	2,2-dichloropropane	1,2-dichloroethane	1,1,1-trichloroethane	1,1-dichloropropene	Cyclohexane	Carbon tetrachloride	Benzene	Dibromomethane	1,2-dichloropropane	Trichloroethene	Bromodichloromethane	trans-1,3-dichloropropene	cis-1,3-dichloropropene	1,1,2-trichloroethane	Toluene	1,3-dichloropropane	Dibromochloromethane
	PQL Envirolab SYD	*10*	*10*	*10*	*10*	*10*	*10*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
	PQL Envirolab VIC	*10*	*10*	*10*	*10*	*10*	*10*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Intra	MW117	<10	<10	<10	<10	<10	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
laboratory	WDUP1	<10	<10	<10	<10	<10	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
duplicate	MEAN	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Inter	MW116	<10	<10	<10	<10	<10	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
laboratory	WDUP2	<10	<10	<10	<10	<10	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
duplicate	MEAN	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc

		1,2-dibromoethane	Tetrachloroethene	1,1,1,2-tetrachloroethane	Chlorobenzene	Ethylbenzene	Bromoform	m+p-xylene	Styrene	1,1,2,2-tetrachloroethane	o-xylene	1,2,3-trichloropropane	Isopropylbenzene	Bromobenzene	n-propyl benzene	2-chlorotoluene	4-chlorotoluene	1,3,5-trimethyl benzene	Tert-butyl benzene	1,2,4-trimethyl benzene	1,3-dichlorobenzene	Sec-butyl benzene	1,4-dichlorobenzene	4-isopropyl toluene	1,2-dichlorobenzene	n-butyl benzene	1,2-dibromo-3-chloropropane	1,2,4-trichlorobenzene	Hexachlorobutadiene	1,2,3-trichlorobenzene
	PQL Envirolab SYD	*1*	*1*	*1*	*1*	*1*	*1*	*2*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
	PQL Envirolab VIC	*1*	*1*	*1*	*1*	*1*	*1*	*2*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Intra	MW117	<1	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
laboratory	WDUP1	<1	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
duplicate	MEAN	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Inter	MW116	<1	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
laboratory	WDUP2	<1	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
duplicate	MEAN	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc

		TRH C6 - C10	TRH >C10-C16	TRH >C16-C34	TRH >C34-C40	Benzene	Toluene	Ethylbenzene	m+p-xylene	o-Xylene	Naphthalene	Acenaphthylene	Acenaph-thene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b,j+k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-c,d)pyrene	Dibenzo(a,h)anthra-cene	Benzo(g,h,i)perylene	Arsenic	Cadmium	Chromium VI	Copper	Lead	Mercury	Nickel	Zinc
	PQL Envirolab SYD	*10*	*50*	*100*	*100*	*1*	*1*	*1*	*2*	*1*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*1*	*0.1*	*1*	*1*	*1*	*0.05*	*1*	*1*
	PQL Envirolab VIC	*10*	*50*	*100*	*100*	*1.0*	*1.0*	*1.0*	*2.0*	*1.0*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*1*	*0.1*	*1*	*1*	*1*	*0.05*	*1*	*1*
Intra	MW117	<10	<50	<100	<100	<1	<1	<1	<2	<1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<1	1	<1	<0.05	1	19
laboratory	WDUP1	<10	<50	<100	<100	<1	<1	<1	<2	<1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<1	<1	<1	<0.05	1	18
duplicate	MEAN	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	0.75	nc	nc	1	18.5
	RPD %	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	67%	nc	nc	0%	5%
Inter	MW116	<10	54	160	<100	<1	<1	<1	<2	<1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	1	<0.1	4	<1	<1	<0.05	2	26
laboratory	WDUP2	<10	<50	270	<100	<1	<1	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	1	<0.1	4	<1	<1	<0.05	2	27
duplicate	MEAN	nc	39.5	215	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	1	nc	4	nc	nc	nc	2	26.5
	RPD %	nc	73%	51%	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	0%	nc	0%	nc	nc	nc	0%	4%
Field	TB-W1	<10	<50	<100	<100	<1	<1	<1	<2	<1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<1	<1	<1	<0.05	<1	<1
Blank	23-25/05/2023																																
Trip	TS-W1	-	-	-	-	99%	128%	116%	127%	122%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Spike	23-25/05/2023																																

Result outside of QA/QC acceptance criteria — Value

Appendix C: Borehole Logs

JKGeotechnics

BOREHOLE LOG

Borehole No. **12**

1/1

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: 35521LF **Method:** SPIRAL AUGER **R.L. Surface:** 875.46m

Date: 26/10/22 **Datum:** AHD

Plant Type: JK400 **Logged/Checked by:** C.S.Y./O.F.

Groundwater Record	Field Tests	Depth (m)	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLET-ION		0		FILL: Clayey silt, low plasticity, dark brown, trace of root fibres and fine to coarse grained igneous gravel.	w>PL			GRASS COVER
			CL	Silty CLAY: low plasticity, brown mottled grey, trace of fine to medium grained ironstone gravel and ash.	w>PL	(F- St)		SCREEN: 10.45kg 0-0.1m NO FCF
	N = 6 3,2,4	1						1 MORE SAMPLE 0.8-1.0m
								RESIDUAL
	N = 13 3,5,8		CI	Silty CLAY: medium plasticity, light grey mottled orange brown and dark grey, trace of fine to medium grained ironstone gravel and ash.	w>PL	Hd	430 500 520	
		2						
	N = 22 6,10,12	3					550 550 500	
1 DAY AFTER PUMP OUT				as above, but without ash.				GROUNDWATER MONITORING WELL INSTALLED TO 6.0m. CLASS 18 MACHINE SLOTTED PVC. STANDPIPE 6.0m TO 2.0m. CASING 2.0m TO 0.13m. 2mm SAND FILTER PACK 6.0m TO 1.1m. BENTONITE SEAL 1.1m TO 0.3m. BACKFILLED WITH SAND TO THE SURFACE. COMPLETED WITH A CONCRETE GATIC COVER.
		4						
	N = 22 8,10,12	5					500 550 570	
				as above, but with ash.				
	N = 17 6,9,8	6					400 450 500	
		7		END OF BOREHOLE AT 6.45m				

JKGeotechnics

BOREHOLE LOG

Borehole No. 14

1/1

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: 35521LF **Method:** SPIRAL AUGER **R.L. Surface:** 875.15m

Date: 26/10/22 **Datum:** AHD

Plant Type: JK400 **Logged/Checked by:** C.S.Y./O.F.

Groundwater Record	SAMPLES (ES, U50, DB, DS)	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION			0			FILL: Clayey silt, low plasticity, dark brown, trace of root fibres, fine to coarse graiend igneous gravel, slag and coal.	w>PL			GRASS COVER SCREEN: 11.28kg 0-0.1m NO FCF
		N = 14 2,6,8			CL-CI	Silty CLAY: low to medium plasticity, light grey mottled orange brown and red brown, trace of ash and fine to medium grained ironstone gravel.	w>PL	VSt-Hd	350 400 450	SCREEN: 3.80kg 0.1-0.5m NO FCF RESIDUAL
			1				w≈PL	Hd		
		N = 25 8,13,12	2						>600 >600 >600	
1 DAY AFTER PUMP OUT		N = 17 5,7,10	3			as above, but without ash.			450 500 520	SPT WENT MORE THAN 0.45m GROUNDWATER MONITORING WELL INSTALLED TO 6.0m. CLASS 18 MACHINE SLOTTED PVC. STANDPIPE 6.0m TO 2.0m. CASING 2.0m TO 0m. 2mm SAND FILTER PACK 6.0m TO 1.5m. BENTONITE SEAL 1.5m TO 0.9m. BACKFILLED WITH SAND TO THE SURFACE. COMPLETED WITH A CONCRETE GATIC COVER.
			4							
		N = 16 6,8,8	5						540 550 580	
		N = 18 7,11,7	6						500 570 530	
						END OF BOREHOLE AT 6.45m				
			7							

JKGeotechnics

BOREHOLE LOG

Borehole No. **15**
1/1

Client: HEALTH INFRASTRUCTURE
Project: PROPOSED HOSPITAL DEVELOPMENT
Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: 35521LF **Method:** SPIRAL AUGER **R.L. Surface:** 876.22m
Date: 26/10/22 **Datum:** AHD
Plant Type: JK400 **Logged/Checked by:** C.S.Y./O.F.

Groundwater Record	Field Tests	Depth (m)	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION		0		FILL: Clayey silt, low plasticity, grey, trace of root fibres, brick and tile fragments.	w>PL			GRASS COVER
			CL	Silty CLAY: low plasticity, light grey mottled orange brown, trace of fine to medium grained ironstone gravel.	w>PL	(S-F)		SCREEN: 10.90kg 0-0.1m NO FCF
1 DAY AFTER PUMP OUT	N = SPT SUNK 200mm	1						SCREEN: 2.45kg 0.1-0.3m NO FCF
								RESIDUAL
					w≈PL	Hd		
	N > 18 13,18/ 150mm REFUSAL	2	CI	Silty CLAY: medium plasticity, orange brown mottled light grey and dark grey, trace of fine to medium grained ironstone gravel and ash.	w<PL	Hd	450 500 500	
	N > 22 8,13,9/ 50mm REFUSAL	3						GROUNDWATER MONITORING WELL INSTALLED TO 6.0m. CLASS 18 MACHINE SLOTTED PVC. STANDPIPE 3.75m TO 0.75m. CASING 0.75m TO 0.2m. 2mm SAND FILTER PACK 6.0m TO 0.5m. BENTONITE SEAL 0.5m TO 0.3m. BACKFILLED WITH SAND TO THE SURFACE. COMPLETED WITH A CONCRETE GATIC COVER.
		4						
	N = 18 7,8,10		ML	Clayey SILT: low plasticity, red brown mottled orange brown.	w<PL	Hd	430 420 450	
		5						
	N = 27 9,12,15	6						
				END OF BOREHOLE AT 6.45m				
		7						

SAMPLES: ES, U50, DB, DS

Graphic Log

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **BH101** 1/2

SDUP103:0-0.1m

Client: HI C/- APP
Project: PROPOSED HOSPITAL DEVELOPMENT
Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** SPIRAL AUGER **R.L. Surface:** N/A
Date: 18/5/23 **Datum:** -
Plant Type: JK205 **Logged/Checked by:** H.W./T.H.

Groundwater Record	SAMPLES (ES, ASS, ASB, SAL, DB)	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
		N = 6 2,1,5	0			FILL: Silty clay, low to medium plasticity, brown, trace of ironstone gravel, slag and ash.	w≈PL			GRASS COVER SCREEN: 0-0.1m 10.70kg, NO FCF
		N = 16 9,9,7			CL-CI	Silty CLAY: low to medium plasticity, light brown and brown, trace of ironstone gravel.	w<PL			SCREEN: 0.1-0.4m 2.10kg, NO FCF RESIDUAL
			1							
		N = 16 5,6,10			CI-CH	as above, but medium to high plasticity, brown mottled grey.				
			2							
						as above, but yellow brown and grey, trace of root fibres.				
		N = 14 5,6,8	3							
			4							
		N = 31 5,13,18	5							
		N = 16 5,7,9	6			Silty Gravelly CLAY: medium to high plasticity, red brown and brown, fine to medium grained, sub-angular igneous gravel.	w≈PL			
			7							

JKEnvironments

ENVIRONMENTAL LOG

Log No. **BH101**

Environmental logs are not to be used for geotechnical purposes

SDUP103:0-0.1m

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 18/5/23 **Datum:** -

Plant Type: JK205 **Logged/Checked by:** H.W./T.H.

Groundwater Record	SAMPLES ES	ASS	ASB	SAL	DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	■					N = 10 6,5,5				Silty Gravelly CLAY: medium to high plasticity, red brown and brown, fine to medium grained, sub-angular ironstone gravel.	w≈PL			
							8			END OF BOREHOLE AT 8.0m				GROUNDWATER MONITORING WELL INSTALLED TO 8m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 2m TO 8m. CASING 0m TO 2m. 2mm SAND FILTER PACK 1.5m TO 8m. BENTONITE SEAL 1m TO 1.5m. BACKFILLED WITH SAND TO THE SURFACE. COMPLETED WITH A CONCRETED GATIC COVER.
							9							
							10							
							11							
							12							
							13							
							14							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **BH102** 1/1

SDUP102: 0-0.2

Client: HI C/- APP
Project: PROPOSED HOSPITAL DEVELOPMENT
Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** HAND AUGER **R.L. Surface:** N/A
Date: 22/5/23 **Datum:** -
Plant Type: - **Logged/Checked by:** O.B./T.H.

Groundwater Record	SAMPLES ES	ASS	ASB	SAL	DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION							0			FILL: Silty clay, low to medium plasticity, brown, trace of igneous gravel, mulch and root fibres.	w≈PL			MULCH COVER SCREEN: 0-0.2m 10.42kg, NO FCF
							1		CI-CH	Silty CLAY: medium to high plasticity, light grey mottled dark grey and orange.	w≈PL			RESIDUAL
							2 3 4 5 6 7			END OF BOREHOLE AT 1.2m				

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **BH103** 1/1

SDUP101: 0-0.2

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 22/5/23 **Datum:** -

Plant Type: - **Logged/Checked by:** O.B./T.H.

Groundwater Record	SAMPLES: ES	ASS	ASB	SAL	DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION	■		■		■		0			FILL: Silty clay, low to medium plasticity, brown, trace of igneous and ironstone gravel, and root fibres.	w≈PL			GRASS COVER SCREEN: 0-0.2m 10.12kg, NO FCF
										END OF BOREHOLE AT 0.2m				HAND AUGER REFUSAL
							1							
							2							
							3							
							4							
							5							
							6							
							7							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **BH104**
1/1
SDUP103: 0-0.2

Client: HI C/- APP
Project: PROPOSED HOSPITAL DEVELOPMENT
Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** HAND AUGER **R.L. Surface:** N/A
Date: 22/5/23 **Datum:** -
Plant Type: - **Logged/Checked by:** O.B./T.H.

Groundwater Record	SAMPLES ES	ASS	ASB	SAL	DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION							0			FILL: Silty clay, low to medium plasticity, dark brown, trace of igneous and ironstone gravel, leaves and root fibres.	w≈PL			LEAF COVER SCREEN: 0-0.2m 10.61kg, NO FCF
										FILL: Silty clay, medium to high plasticity, brown, trace of root fibres.	w≈PL			SCREEN: 0.4-0.6m 5.40kg, NO FCF
							1			END OF BOREHOLE AT 0.9m				HAND AUGER REFUSAL
							2							
							3							
							4							
							5							
							6							
							7							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **BH105** 1/1

SDUP104: 0-0.2

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 22/5/23 **Datum:** -

Plant Type: - **Logged/Checked by:** O.B./T.H.

Groundwater Record	SAMPLES: ES	ASS	ASB	SAL	DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION							0			FILL: Silty clay, low to medium plasticity, brown, trace of igneous and ironstone gravel, and root fibres.	w≈PL			GRASS COVER SCREEN: 0-0.2m 10.98kg, NO FCF
									CI-CH	Silty CLAY: medium to high plasticity, light grey mottled dark grey.	w≈PL			RESIDUAL
							1			END OF BOREHOLE AT 0.9m				
							2							
							3							
							4							
							5							
							6							
							7							

JKEnvironments

ENVIRONMENTAL LOG

Log No. **BH106** 1/1

Environmental logs are not to be used for geotechnical purposes

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** PENDULUM / AUGER **R.L. Surface:** N/A

Date: 23/5/23 **Datum:** -

Plant Type: EXCAVATOR **Logged/Checked by:** O.B./T.H.

Groundwater Record	SAMPLES ES	ASS	ASB	SAL	DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION	■		■		■		0			FILL: Silty clay, low to medium plasticity, brown, trace of root fibres.	w≈PL			GRASS COVER SCREEN: 0-0.2m 5.01kg, NO FCF
	■		■						CI	Silty CLAY: medium plasticity, light grey mottled orange and brown.	w≈PL			RESIDUAL
							1			END OF BOREHOLE AT 1.0m				
							2							
							3							
							4							
							5							
							6							
							7							

JKEnvironments

ENVIRONMENTAL LOG

Log No. **BH107** 1/1

Environmental logs are not to be used for geotechnical purposes

Client: HI C/- APP
Project: PROPOSED HOSPITAL DEVELOPMENT
Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** SPIRAL AUGER **R.L. Surface:** N/A
Date: 19/5/23 **Datum:** -
Plant Type: JK205 **Logged/Checked by:** H.W./T.H.

Groundwater Record	SAMPLES (ES, ASS, ASB, SAL, DB)	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION		N = 26 3,11,15	0		-	ASPHALTIC CONCRETE: 10mm.t	M			SCREEN: 0.01m-1.0m 7.52kg, NO FCF
		N = 35 12,19,16				FILL: Silty clayey sand, fine to medium grained, brown, with igneous gravel, trace of sandstone gravel.				
			1							SCREEN: 1.0-1.4m 12.39kg, NO FCF
		N = 18 5,8,10			CI-CH	Silty CLAY: medium to high plasticity, orange brown and grey, trace of ironstone bands.	w≈PL			RESIDUAL
			2			END OF BOREHOLE AT 1.95m				
			3							
			4							
			5							
			6							
			7							

JKEnvironments

ENVIRONMENTAL LOG

Log No. **BH108** 1/1

Environmental logs are not to be used for geotechnical purposes

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** PENDULUM / AUGER **R.L. Surface:** N/A

Date: 23/5/23 **Datum:** -

Plant Type: EXCAVATOR **Logged/Checked by:** O.B./T.H.

Groundwater Record	SAMPLES ES	ASS	ASB	SAL	DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION							0			FILL: Silty clay, medium plasticity, brown, trace of ash and root fibres.	w≈PL			GRASS COVER 0-0.2m 7.91kg, NO FCF
									CI-CH	Silty CLAY: medium to high plasticity, light grey mottled brown.	w≈PL			RESIDUAL
							1			END OF BOREHOLE AT 1.0m				
							2							
							3							
							4							
							5							
							6							
							7							

JKEnvironments

ENVIRONMENTAL LOG

Log No. **BH109** 1/1

Environmental logs are not to be used for geotechnical purposes

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 22/5/23 **Datum:** -

Plant Type: - **Logged/Checked by:** O.B./T.H.

Groundwater Record	SAMPLES ES	ASS	ASB	SAL	DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION	■		■		■		0			FILL: Silty clay, low to medium plasticity, dark brown, trace of igneous and ironstone gravel, ash and root fibres.	w≈PL			GRASS COVER SCREEN: 0-0.2m 12.01kg, NO FCF
	■		■						CI-CH	Silty CLAY: medium to high plasticity, grey mottled dark grey and brown, trace of ash.	w≈PL			RESIDUAL
							1			END OF BOREHOLE AT 1.0m				
							2							
							3							
							4							
							5							
							6							
							7							

JKEnvironments

ENVIRONMENTAL LOG

Log No. **BH110**
1/1

Environmental logs are not to be used for geotechnical purposes

Client: HI C/- APP
Project: PROPOSED HOSPITAL DEVELOPMENT
Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** HAND AUGER **R.L. Surface:** N/A
Date: 22/5/23 **Datum:** -
Plant Type: - **Logged/Checked by:** O.B./T.H.

Groundwater Record	SAMPLES ES	ASS	ASB	SAL	DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION	■		■		■		0			FILL: Silty clay, medium plasticity, brown, trace of igneous gravel and root fibres.	w≈PL			GRASS COVER SCREEN: 0-0.2m 11.45kg, NO FCF
							1			END OF BOREHOLE AT 0.6m				HAND AUGER REFUSAL
							2							
							3							
							4							
							5							
							6							
							7							

JKEnvironments

ENVIRONMENTAL LOG

Log No. **BH111** 1/1

Environmental logs are not to be used for geotechnical purposes

Client: HI C/- APP
Project: PROPOSED HOSPITAL DEVELOPMENT
Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** HAND AUGER **R.L. Surface:** N/A
Date: 22/5/23 **Datum:** -
Plant Type: - **Logged/Checked by:** O.B./T.H.

Groundwater Record	SAMPLES ES	ASS	ASB	SAL	DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION							0			FILL: Silty clay, medium plasticity, red brown, trace of igneous and ironstone gravel and root fibres.	w≈PL			GRASS COVER SCREEN: 0-0.2m 10.67kg, NO FCF
									CI-CH	Silty CLAY: medium to high plasticity, grey.	w≈PL			RESIDUAL
										END OF BOREHOLE AT 0.7m				
							1							
							2							
							3							
							4							
							5							
							6							
							7							

JKEnvironments

ENVIRONMENTAL LOG

Log No. **BH112** 1/1

Environmental logs are not to be used for geotechnical purposes

Client: HI C/- APP
Project: PROPOSED HOSPITAL DEVELOPMENT
Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** HAND AUGER **R.L. Surface:** N/A
Date: 23/5/23 **Datum:** -
Plant Type: - **Logged/Checked by:** O.B./T.H.

Groundwater Record	SAMPLES (ES, ASS, ASB, SAL, DB)	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION			0			FILL: Silty clay, low to medium plasticity, brown, trace of slag, roots and root fibres.	w≈PL			GRASS COVER
					CL-CI	Silty Sandy CLAY: low to medium plasticity, brown mottled orange and light grey, fine to medium grained sand.	w≈PL			SCREEN: 0-0.2m 13.01kg, NO FCF RESIDUAL
					CL	Silty Sandy CLAY: low plasticity, brown mottled orange, fine to coarse grained sand.	w<PL			RESIDUAL
			1			END OF BOREHOLE AT 0.8m				
			2							
			3							
			4							
			5							
			6							
			7							

JKEnvironments

ENVIRONMENTAL LOG

Log No. **BH113** 1/1

Environmental logs are not to be used for geotechnical purposes

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 19/5/23 **Datum:** -

Plant Type: JK205 **Logged/Checked by:** H.W./T.H.

Groundwater Record	SAMPLES (ES, ASS, ASB, SAL, DB)	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION		N = 13 3,5,8	0			FILL: Silty clay, low to medium plasticity, brown, trace of igneous and sandstone gravel, glass and ash.	w<PL			GRASS COVER SCREEN: 0-0.1m 10.30kg, NO FCF
		N = 30 8,9,11			CI-CH	Silty CLAY: medium to high plasticity, yellow brown and grey, trace of ironstone gravel and ironstone bands.	w≈PL			SCREEN: 0.1-0.5m 4.29kg, NO FCF RESIDUAL
			1							
		N = 16 7,7,9								
			2			END OF BOREHOLE AT 1.95m				
			3							
			4							
			5							
			6							
			7							

JKEnvironments

ENVIRONMENTAL LOG

Log No. **BH114** 1/1

Environmental logs are not to be used for geotechnical purposes

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** PENDULUM / AUGER **R.L. Surface:** N/A

Date: 23/5/23 **Datum:** -

Plant Type: EXCAVATOR **Logged/Checked by:** O.B./T.H.

Groundwater Record	SAMPLES ES	ASS	ASB	SAL	DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION	■		■		■		0			FILL: Silty clay, low to medium plasticity, brown, trace of ash and root fibres.	w≈PL			GRASS COVER SCREEN: 0-0.2m 10.02kg, NO FCF
	■		■						CI	Silty CLAY: medium plasticity, grey mottled orange and brown.	w≈PL			RESIDUAL
							1			END OF BOREHOLE AT 1.0m				
							2							
							3							
							4							
							5							
							6							
							7							

JKEnvironments

ENVIRONMENTAL LOG

Log No. **BH115**

1/1

Environmental logs are not to be used for geotechnical purposes

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 19/5/23 **Datum:** -

Plant Type: JK205 **Logged/Checked by:** H.W./T.H.

Groundwater Record	SAMPLES (ES, ASS, ASB, SAL, DB)	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION		N > 8 6,4,4/ 50mm REFUSAL	0		-	ASPHALTIC CONCRETE: 10mm.t				SCREEN: 0.01-0.5m 9.80kg, NO FCF
						FILL: Gravelly clay, low plasticity, brown, fine to medium grained, sub-angular igneous and ironstone gravel, trace of sand and ash.	w≈PL			
						END OF BOREHOLE AT 0.5m				'TC' BIT REFUSAL ON INFERRED CONCRETE FOOTING
			1							
			2							
			3							
			4							
			5							
			6							
			7							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **BH116**
1/2

SDUP101: 0.015-0.465m
SDUP102: 4.5-4.95m

Client: HI C/- APP
Project: PROPOSED HOSPITAL DEVELOPMENT
Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** SPIRAL AUGER **R.L. Surface:** N/A
Date: 17/5/23 **Datum:** -
Plant Type: JK205 **Logged/Checked by:** H.W./T.H.

Groundwater Record	Samples (ES, ASS, ASB, SAL, DB)	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
		N = 13 4,6,7	0		-	ASPHALTIC CONCRETE: 15mm.t				NO FCF OBSERVED IN SPOIL
		N = 16 6,10,6				FILL: Gravelly clay, low to medium plasticity, brown and light brown, fine to medium grained, sub-angular igneous and ironstone gravel, trace of sand.	w<PL			
		N = 29 7,12,17	1		CI-CH	Silty CLAY: medium to high plasticity, brown, trace of iron indurated bands, ironstone gravel and ash.	w≈PL			RESIDUAL
		N = 22 5,10,12	2, 3							
		N = 32 8,16,16	4		CL-CI	Silty Gravelly CLAY: low to medium plasticity, brown, fine to medium grained, sub-angular ironstone gravel.	w≈PL			RESIDUAL
		N = 26 7,12,14	5, 6, 7		CI-CH	Silty CLAY: medium to high plasticity, yellow brown, trace of ash.	w<PL			RESIDUAL

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **BH116** 2/2

SDUP101:0.015-0.465m
SDUP102: 4.5-4.95m

Client: HI C/- APP
Project: PROPOSED HOSPITAL DEVELOPMENT
Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** SPIRAL AUGER **R.L. Surface:** N/A
Date: 17/5/23 **Datum:** -
Plant Type: JK205 **Logged/Checked by:** H.W./T.H.

Groundwater Record	SAMPLES ES	ASS	ASB	SAL	DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
						N = 21 6,8,13				Silty CLAY: medium to high plasticity, yellow brown, trace of ash.	w<PL			
							8			END OF BOREHOLE AT 8.0m				GROUNDWATER MONITORING WELL INSTALLED TO 8m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 2m TO 8m. CASING 0m TO 2m. 2mm SAND FILTER PACK 1.5m TO 8m. BENTONITE SEAL 1m TO 1.5m. BACKFILLED WITH SAND TO THE SURFACE. COMPLETED WITH A CONCRETED GATIC COVER.
							9							
							10							
							11							
							12							
							13							
							14							

JKEnvironments

ENVIRONMENTAL LOG

Log No. **BH117**

1/2

Environmental logs are not to be used for geotechnical purposes

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 17/5/23 **Datum:** -

Plant Type: JK205 **Logged/Checked by:** H.W./T.H.

Groundwater Record	SAMPLES (ES, ASS, ASB, SAL, DB)	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES, ASB	N = 19 5,9,10	0		-	ASPHALTIC CONCRETE: 10mm.t	w<PL			NO FCF OBSERVED IN SPOIL
	ES, ASB	N = 18 6,9,9				FILL: Gravelly clay, low to medium plasticity, fine to medium grained, sub-angular igneous gravel, trace of sand.				
			1		CI-CH	Silty CLAY: medium to high plasticity, grey and yellow brown, trace of iron indurated bands and ash.	w≈PL			RESIDUAL
	ES, ASB	N = 22 7,10,12	2							
	ES	N = 12 5,5,7	3			as above, but yellow brown and dark brown, trace of ironstone gravel.				
	ES	N = 11 3,5,6	4				w>PL			
			5							
▶	ES	N = 10 3,4,6	6							
			7							

JKEnvironments

ENVIRONMENTAL LOG

Log No. **BH117**

Environmental logs are not to be used for geotechnical purposes

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 17/5/23 **Datum:** -

Plant Type: JK205 **Logged/Checked by:** H.W./T.H.

Groundwater Record	SAMPLES ES	ASS	ASB	SAL	DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	■					N = 21 5,11,10				Silty CLAY: medium to high plasticity, yellow brown and dark brown, trace of ironstone gravel and ash.	w>PL			
							8			END OF BOREHOLE AT 8.0m				GROUNDWATER MONITORING WELL INSTALLED TO 8m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 2m TO 8m. CASING 0m TO 2m. 2mm SAND FILTER PACK 1.4m TO 8m. BENTONITE SEAL 0.5m TO 1.4m. BACKFILLED WITH SAND TO THE SURFACE. COMPLETED WITH A CONCRETED GATIC COVER.
							9							
							10							
							11							
							12							
							13							
							14							

JKEnvironments

ENVIRONMENTAL LOG

Log No. **BH118**

1/1

Environmental logs are not to be used for geotechnical purposes

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** PENDULUM / AUGER **R.L. Surface:** N/A

Date: 23/5/23 **Datum:** -

Plant Type: EXCAVATOR **Logged/Checked by:** O.B./T.H.

Groundwater Record	SAMPLES ES	ASS	ASB	SAL	DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION	■		■		■		0			FILL: Silty clay, medium plasticity, brown, trace of root fibres.	w≈PL			GRASS COVER
	■		■						CI-CH	Silty CLAY: medium to high plasticity, light brown mottled orange.	w≈PL			SCREEN: 0-0.2m 4.54kg, NO FCF RESIDUAL
										END OF BOREHOLE AT 0.8m				
							1							
							2							
							3							
							4							
							5							
							6							
							7							

JKEnvironments

ENVIRONMENTAL LOG

Log No. **BH119** 1/1

Environmental logs are not to be used for geotechnical purposes

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** PENDULUM / AUGER **R.L. Surface:** N/A

Date: 23/5/23 **Datum:** -

Plant Type: EXCAVATOR **Logged/Checked by:** O.B./T.H.

Groundwater Record	SAMPLES ES	ASS	ASB	SAL	DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION	■		■		■		0			FILL: Silty clay, low to medium plasticity, brown, trace of glass, roots and root fibres.	w≈PL			GRASS COVER SCREEN: 0-0.2m 6.45kg, NO FCF
	■		■				1		CL-CI	Silty CLAY: low to medium plasticity, light grey mottled orange and brown.	w<PL			RESIDUAL
										END OF BOREHOLE AT 1.1m				
							2							
							3							
							4							
							5							
							6							
							7							

JKEnvironments

ENVIRONMENTAL LOG

Log No. **BH120** 1/1

Environmental logs are not to be used for geotechnical purposes

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 18/5/23 **Datum:** -

Plant Type: JK205 **Logged/Checked by:** H.W./T.H.

Groundwater Record	Field Tests	Depth (m)	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION	N = 20 3,6,14	0		FILL: Silty clay, low to medium plasticity, brown, trace of igneous and ironstone gravel, root fibres and ash.	w≈PL			GRASS COVER SCREEN: 0-0.1m 10.85kg, NO FCF
	N > 20 10,20/ 100mm REFUSAL	1	CI-CH	Silty CLAY: medium to high plasticity, yellow brown and grey, trace of ironstone gravel.	w<PL			SCREEN: 0.1-0.3m 2.90kg, NO FCF RESIDUAL
	N = 33 9,17,16			Silty Gravelly CLAY: medium to high plasticity, red brown, fine to medium grained, sub-angular ironstone gravel.	w≈PL			RESIDUAL
		2		END OF BOREHOLE AT 1.95m				
		3						
		4						
		5						
		6						
		7						

SAMPLES: ES, ASS, ASB, SAL, DB

JKEnvironments

ENVIRONMENTAL LOG

Log No.
BH121
1/1

Environmental logs are not to be used for geotechnical purposes

Client: HI C/- APP
Project: PROPOSED HOSPITAL DEVELOPMENT
Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** SPIRAL AUGER **R.L. Surface:** N/A
Date: 18/5/23 **Datum:** -
Plant Type: JK205 **Logged/Checked by:** H.W./T.H.

Groundwater Record	SAMPLES: ES	ASS	ASB	SAL	DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION						N = 6 2,2,4	0			FILL: Silty clay, low to medium plasticity, brown, trace of root fibres.	w≈PL			GRASS COVER
						N = 28 7,12,16			CI-CH	Silty CLAY: medium to high plasticity, yellow brown and grey, trace of ironstone gravel.	w≈PL			NO FCF OBSERVED IN SPOIL RESIDUAL
							1			END OF BOREHOLE AT 0.95m				
							2							
							3							
							4							
							5							
							6							
							7							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **BH122** 1/1

SDUP104: 0.03-0.4m

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 18/5/23 **Datum:** -

Plant Type: JK205 **Logged/Checked by:** H.W./T.H.

Groundwater Record	SAMPLES (ES, ASS, ASB, SAL, DB)	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION		N = 22 14,14,8	0		-	ASPHALTIC CONCRETE: 30mm.t FILL: Gravelly sand, fine to medium grained, orange brown, fine to medium grained, sub-angular igneous gravel.	D			NO FCF OBSERVED IN SPOIL
		N = 30 6,14,16	1		CL-CI	Silty CLAY: low to medium plasticity, yellow brown and grey, trace of ironstone gravel and ash.	w<PL			RESIDUAL
						END OF BOREHOLE AT 1.45m				
			2							
			3							
			4							
			5							
			6							
			7							

JKEnvironments

ENVIRONMENTAL LOG

Log No. **SV1**

Environmental logs are not to be used for geotechnical purposes

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 18/5/23 **Datum:** -

Plant Type: JK205 **Logged/Checked by:** H.W./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION							0			FILL: Silty clay, low to medium plasticity, brown, trace of igneous gravel.	w>PL			GRASS COVER
							1			FILL: Silty sand, fine to medium grained, red brown, trace of igneous gravel, concrete and brick fragments.	M			
							2			END OF BOREHOLE AT 1.2m				'TC' BIT REFUSAL SOIL VAPOUR MONITORING WELL INSTALLED TO 1.2m. 2mm SAND FILTER PACK 0.7m TO 1.2m. BENTONITE SEAL 0.2m TO 0.7m. BACKFILLED WITH SAND TO THE SURFACE. COMPLETED WITH A CONCRETED GATIC COVER.
							3							
							4							
							5							
							6							
							7							

JKEnvironments

ENVIRONMENTAL LOG

Log No. **SV2**

1/1

Environmental logs are not to be used for geotechnical purposes

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 18/5/23 **Datum:** -

Plant Type: JK205 **Logged/Checked by:** H.W./T.H.

Groundwater Record	SAMPLES ES	ASS	ASB	SAL	DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION							0 – 1			FILL: Silty clay, low to medium plasticity, brown, trace of igneous gravel and ash.	w>PL			GRASS COVER
							1.2 – 7			END OF BOREHOLE AT 1.2m				SOIL VAPOUR MONITORING WELL INSTALLED TO 1.2m. 2mm SAND FILTER PACK 0.7m TO 1.2m. BENTONITE SEAL 0.2m TO 0.7m. BACKFILLED WITH SAND TO THE SURFACE. COMPLETED WITH A CONCRETED GATIC COVER.

ENVIRONMENTAL LOGS EXPLANATION NOTES

INTRODUCTION

These notes have been provided to amplify the environmental report in regard to classification methods, field procedures and certain matters relating to the logging of soil and rock. Not all notes are necessarily relevant to all reports.

Where geotechnical borehole logs are utilised for environmental purpose, reference should also be made to the explanatory notes included in the geotechnical report. Environmental logs are not suitable for geotechnical purposes.

The ground is a product of continuing natural and man-made processes and therefore exhibits a variety of characteristics and properties which vary from place to place and can change with time. Environmental studies include gathering and assimilating limited facts about these characteristics and properties in order to understand or predict the behaviour of the ground on a particular site under certain conditions. This report may contain such facts obtained by inspection, excavation, probing, sampling, testing or other means of investigation. If so, they are directly relevant only to the ground at the place where and time when the investigation was carried out.

DESCRIPTION AND CLASSIFICATION METHODS

The methods of description and classification of soils and rocks used in this report are based on Australian Standard 1726:2017 *'Geotechnical Site Investigations'*. In general, descriptions cover the following properties – soil or rock type, colour, structure, strength or density, and inclusions. Identification and classification of soil and rock involves judgement and the Company infers accuracy only to the extent that is common in current geoenvironmental practice.

Soil types are described according to the predominating particle size and behaviour as set out in the attached soil classification table qualified by the grading of other particles present (eg. sandy clay) as set out below:

Soil Classification	Particle Size
Clay	< 0.002mm
Silt	0.002 to 0.075mm
Sand	0.075 to 2.36mm
Gravel	2.36 to 63mm
Cobbles	63 to 200mm
Boulders	> 200mm

Non-cohesive soils are classified on the basis of relative density, generally from the results of Standard Penetration Test (SPT) as below:

Relative Density	SPT 'N' Value (blows/300mm)
Very loose (VL)	< 4
Loose (L)	4 to 10
Medium dense (MD)	10 to 30
Dense (D)	30 to 50
Very Dense (VD)	> 50

Cohesive soils are classified on the basis of strength (consistency) either by use of a hand penetrometer, vane shear, laboratory testing and/or tactile engineering examination. The strength terms are defined as follows.

Classification	Unconfined Compressive Strength (kPa)	Indicative Undrained Shear Strength (kPa)
Very Soft (VS)	≤ 25	≤ 12
Soft (S)	> 25 and ≤ 50	> 12 and ≤ 25
Firm (F)	> 50 and ≤ 100	> 25 and ≤ 50
Stiff (St)	> 100 and ≤ 200	> 50 and ≤ 100
Very Stiff (VSt)	> 200 and ≤ 400	> 100 and ≤ 200
Hard (Hd)	> 400	> 200
Friable (Fr)	Strength not attainable – soil crumbles	

Rock types are classified by their geological names, together with descriptive terms regarding weathering, strength, defects, etc. Where relevant, further information regarding rock classification is given in the text of the report. In the Sydney Basin, 'shale' is used to describe fissile mudstone, with a weakness parallel to bedding. Rocks with alternating inter-laminations of different grain size (eg. siltstone/claystone and siltstone/fine grained sandstone) are referred to as 'laminite'.

INVESTIGATION METHODS

The following is a brief summary of investigation methods currently adopted by the Company and some comments on their use and application. All methods except test pits, hand auger drilling and portable Dynamic Cone Penetrometers require the use of a mechanical rig which is commonly mounted on a truck chassis or track base.

Test Pits: These are normally excavated with a backhoe or a tracked excavator, allowing close examination of the insitu soils and 'weaker' bedrock if it is safe to descend into the pit. The depth of penetration is limited to about 3m for a backhoe and up to 6m for a large excavator. Limitations of test pits are the problems associated with disturbance and difficulty of reinstatement and the consequent effects on close-by structures. Care must be taken if construction is to be carried out near test pit locations to either properly recompact the backfill during construction or to design and construct the structure so as not to be adversely affected by poorly compacted backfill at the test pit location.

Hand Auger Drilling: A borehole of 50mm to 100mm diameter is advanced by manually operated equipment. Refusal of the hand auger can occur on a variety of materials such as obstructions within any fill, tree roots, hard clay, gravel or ironstone, cobbles and boulders, and does not necessarily indicate rock level.

Continuous Spiral Flight Augers: The borehole is advanced using 75mm to 115mm diameter continuous spiral flight augers, which are withdrawn at intervals to allow sampling and insitu testing. This is a relatively economical means of drilling in clays and in sands above the water table. Samples are returned to the surface by the flights or may be collected after withdrawal of the auger flights, but they can be very disturbed and layers may become mixed. Information from the auger sampling (as distinct from specific sampling by SPTs or undisturbed samples) is of limited reliability due to mixing or softening of samples by groundwater, or uncertainties as to the original depth of the samples. Augering below the groundwater table is of even lesser reliability than augering above the water table.

Rock Augering: Use can be made of a Tungsten Carbide (TC) bit for auger drilling into rock to indicate rock quality and continuity by variation in drilling resistance and from examination of recovered rock cuttings. This method of investigation is quick and relatively inexpensive but provides only an indication of the likely rock strength and predicted values may be in error by a strength order. Where rock strengths may have a significant impact on construction feasibility or costs, then further investigation by means of cored boreholes may be warranted.

Wash Boring: The borehole is usually advanced by a rotary bit, with water being pumped down the drill rods and returned up the annulus, carrying the drill cuttings. Only major changes in stratification can be assessed from the cuttings, together with some information from "feel" and rate of penetration.

Mud Stabilised Drilling: Either Wash Boring or Continuous Core Drilling can use drilling mud as a circulating fluid to stabilise the borehole. The term 'mud' encompasses a range of products ranging from bentonite to polymers. The mud tends to mask the cuttings and reliable identification is only possible from intermittent intact sampling (eg. from SPT and U50 samples) or from rock coring, etc.

Continuous Core Drilling: A continuous core sample is obtained using a diamond tipped core barrel. Provided full core recovery is achieved (which is not always possible in very low strength rocks and granular soils), this technique provides a very reliable (but relatively expensive) method of investigation. In rocks, NMLC or HQ triple tube core barrels, which give a core of about 50mm and 61mm diameter, respectively, is usually used with water flush. The length of core recovered is compared to the length drilled and any length not recovered is shown as NO CORE. The location of NO CORE recovery is determined on site by the supervising engineer; where the location is uncertain, the loss is placed at the bottom of the drill run.

Standard Penetration Tests: Standard Penetration Tests (SPT) are used mainly in non-cohesive soils, but can also be used in cohesive soils, as a means of indicating density or strength and also of obtaining a relatively undisturbed sample. The test procedure is described in Australian Standard 1289.6.3.1–2004 (R2016) *'Methods of Testing Soils for Engineering Purposes, Soil Strength and Consolidation Tests – Determination of the Penetration Resistance of a Soil – Standard Penetration Test (SPT)'*.

The test is carried out in a borehole by driving a 50mm diameter split sample tube with a tapered shoe, under the impact of a 63.5kg hammer with a free fall of 760mm. It is normal for the tube to be driven in three successive 150mm increments and the 'N' value is taken as the number of blows for the last 300mm. In dense sands, very hard clays or weak rock, the full 450mm penetration may not be practicable and the test is discontinued.

The test results are reported in the following form:

- In the case where full penetration is obtained with successive blow counts for each 150mm of, say, 4, 6 and 7 blows, as

  N = 13
  4, 6, 7

- In a case where the test is discontinued short of full penetration, say after 15 blows for the first 150mm and 30 blows for the next 40mm, as

  N > 30
  15, 30/40mm

The results of the test can be related empirically to the engineering properties of the soil.

A modification to the SPT is where the same driving system is used with a solid 60° tipped steel cone of the same diameter as the SPT hollow sampler. The solid cone can be continuously driven for some distance in soft clays or loose sands, or may be used where damage would otherwise occur to the SPT. The results of this Solid Cone Penetration Test (SCPT) are shown as 'N_c' on the borehole logs, together with the number of blows per 150mm penetration.

LOGS

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

The terms and symbols used in preparation of the logs are defined in the following pages.

Interpretation of the information shown on the logs, and its application to design and construction, should therefore take into account the spacing of boreholes or test pits, the method of drilling or excavation, the frequency of sampling and testing and the possibility of other than 'straight line' variations between the boreholes or test pits. Subsurface conditions between boreholes or test pits may vary significantly from conditions encountered at the borehole or test pit locations.

GROUNDWATER

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

- Although groundwater may be present, in low permeability soils it may enter the hole slowly or perhaps not at all during the time it 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 and may not be the same at the time of construction.
- 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 be washed out of the hole or 'reverted' chemically if reliable water observations are to be made.

More reliable measurements can be made by installing standpipes which are read after the groundwater level has stabilised at intervals ranging from several days to 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 perched water tables or surface water.

FILL

The presence of fill materials can often be determined only by the inclusion of foreign objects (eg. bricks, steel, etc) or by distinctly unusual colour, texture or fabric. Identification of the extent of fill materials will also depend on investigation methods and frequency. Where natural soils similar to those at the site are used for fill, it may be difficult with limited testing and sampling to reliably assess the extent of the fill.

The presence of fill materials is usually regarded with caution as the possible variation in density and material type is much greater than with natural soil deposits. Consequently, there is an increased risk of adverse environmental characteristics or behaviour. If the volume and nature of fill is of importance to a project, then frequent test pit excavations are preferable to boreholes.

LABORATORY TESTING

Laboratory testing has not been undertaken to confirm the soil classification and rock strengths indicated on the environmental logs unless noted in the report.

SYMBOL LEGENDS

SOIL

- FILL
- TOPSOIL
- CLAY (CL, CI, CH)
- SILT (ML, MH)
- SAND (SP, SW)
- GRAVEL (GP, GW)
- SANDY CLAY (CL, CI, CH)
- SILTY CLAY (CL, CI, CH)
- CLAYEY SAND (SC)
- SILTY SAND (SM)
- GRAVELLY CLAY (CL, CI, CH)
- CLAYEY GRAVEL (GC)
- SANDY SILT (ML, MH)
- PEAT AND HIGHLY ORGANIC SOILS (Pt)

ROCK

- CONGLOMERATE
- SANDSTONE
- SHALE/MUDSTONE
- SILTSTONE
- CLAYSTONE
- COAL
- LAMINITE
- LIMESTONE
- PHYLLITE, SCHIST
- TUFF
- GRANITE, GABBRO
- DOLERITE, DIORITE
- BASALT, ANDESITE
- QUARTZITE

OTHER MATERIALS

- BRICKS OR PAVERS
- CONCRETE
- ASPHALTIC CONCRETE

CLASSIFICATION OF COARSE AND FINE GRAINED SOILS

Major Divisions		Group Symbol	Typical Names	Field Classification of Sand and Gravel	Laboratory Classification	
Coarse grained soil (more than 65% of soil excluding oversize fraction is greater than 0.075mm)	GRAVEL (more than half of coarse fraction is larger than 2.36mm	GW	Gravel and gravel-sand mixtures, little or no fines	Wide range in grain size and substantial amounts of all intermediate sizes, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	$C_u > 4$ $1 < C_c < 3$
		GP	Gravel and gravel-sand mixtures, little or no fines, uniform gravels	Predominantly one size or range of sizes with some intermediate sizes missing, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	Fails to comply with above
		GM	Gravel-silt mixtures and gravel-sand-silt mixtures	'Dirty' materials with excess of non-plastic fines, zero to medium dry strength	≥ 12% fines, fines are silty	Fines behave as silt
		GC	Gravel-clay mixtures and gravel-sand-clay mixtures	'Dirty' materials with excess of plastic fines, medium to high dry strength	≥ 12% fines, fines are clayey	Fines behave as clay
	SAND (more than half of coarse fraction is smaller than 2.36mm)	SW	Sand and gravel-sand mixtures, little or no fines	Wide range in grain size and substantial amounts of all intermediate sizes, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	$C_u > 6$ $1 < C_c < 3$
		SP	Sand and gravel-sand mixtures, little or no fines	Predominantly one size or range of sizes with some intermediate sizes missing, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	Fails to comply with above
		SM	Sand-silt mixtures	'Dirty' materials with excess of non-plastic fines, zero to medium dry strength	≥ 12% fines, fines are silty	N/A
		SC	Sand-clay mixtures	'Dirty' materials with excess of plastic fines, medium to high dry strength	≥ 12% fines, fines are clayey	

Major Divisions		Group Symbol	Typical Names	Field Classification of Silt and Clay			Laboratory Classification
				Dry Strength	Dilatancy	Toughness	% < 0.075mm
ine grained soils (more than 35% of soil excluding oversize fraction is less than 0.075mm)	SILT and CLAY (low to medium plasticity)	ML	Inorganic silt and very fine sand, rock flour, silty or clayey fine sand or silt with low plasticity	None to low	Slow to rapid	Low	Below A line
		CL, CI	Inorganic clay of low to medium plasticity, gravelly clay, sandy clay	Medium to high	None to slow	Medium	Above A line
		OL	Organic silt	Low to medium	Slow	Low	Below A line
	SILT and CLAY (high plasticity)	MH	Inorganic silt	Low to medium	None to slow	Low to medium	Below A line
		CH	Inorganic clay of high plasticity	High to very high	None	High	Above A line
		OH	Organic clay of medium to high plasticity, organic silt	Medium to high	None to very slow	Low to medium	Below A line
	Highly organic soil	Pt	Peat, highly organic soil	–	–	–	–

Laboratory Classification Criteria

A well graded coarse grained soil is one for which the coefficient of uniformity $Cu > 4$ and the coefficient of curvature $1 < C_c < 3$. Otherwise, the soil is poorly graded. These coefficients are given by:

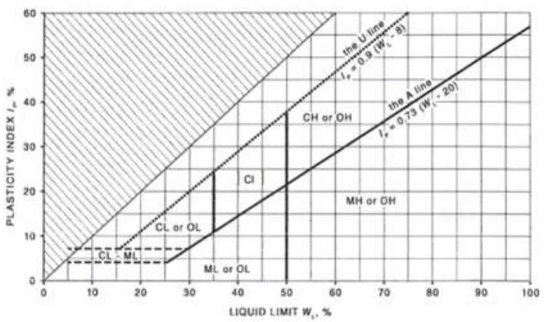
$$C_U = \frac{D_{60}}{D_{10}} \quad \text{and} \quad C_C = \frac{(D_{30})^2}{D_{10}\,D_{60}}$$

Where D_{10}, D_{30} and D_{60} are those grain sizes for which 10%, 30% and 60% of the soil grains, respectively, are smaller.

NOTES:

1 For a coarse grained soil with a fines content between 5% and 12%, the soil is given a dual classification comprising the two group symbols separated by a dash; for example, for a poorly graded gravel with between 5% and 12% silt fines, the classification is GP-GM.
2 Where the grading is determined from laboratory tests, it is defined by coefficients of curvature (C_c) and uniformity (C_u) derived from the particle size distribution curve.
3 Clay soils with liquid limits > 35% and ≤ 50% may be classified as being of medium plasticity.
4 The U line on the Modified Casagrande Chart is an approximate upper bound for most natural soils.

Modified Casagrande Chart for Classifying Silts and Clays according to their Behaviour



LOG SYMBOLS

Log Column	Symbol	Definition
Groundwater Record	▼	Standing water level. Time delay following completion of drilling/excavation may be shown.
	—C—	Extent of borehole/test pit collapse shortly after drilling/excavation.
	▶—	Groundwater seepage into borehole or test pit noted during drilling or excavation.
Samples	ES	Sample taken over depth indicated, for environmental analysis.
	U50	Undisturbed 50mm diameter tube sample taken over depth indicated.
	DB	Bulk disturbed sample taken over depth indicated.
	DS	Small disturbed bag sample taken over depth indicated.
	ASB	Soil sample taken over depth indicated, for asbestos analysis.
	ASS	Soil sample taken over depth indicated, for acid sulfate soil analysis.
	SAL	Soil sample taken over depth indicated, for salinity analysis.
	PFAS	Soil sample taken over depth indicated, for analysis of Per- and Polyfluoroalkyl Substances.
Field Tests	N = 17 4, 7, 10	Standard Penetration Test (SPT) performed between depths indicated by lines. Individual figures show blows per 150mm penetration. 'Refusal' refers to apparent hammer refusal within the corresponding 150mm depth increment.
	N_c = 5 7 3R	Solid Cone Penetration Test (SCPT) performed between depths indicated by lines. Individual figures show blows per 150mm penetration for 60° solid cone driven by SPT hammer. 'R' refers to apparent hammer refusal within the corresponding 150mm depth increment.
	VNS = 25	Vane shear reading in kPa of undrained shear strength.
	PID = 100	Photoionisation detector reading in ppm (soil sample headspace test).
Moisture Condition (Fine Grained Soils)	w > PL	Moisture content estimated to be greater than plastic limit.
	w ≈ PL	Moisture content estimated to be approximately equal to plastic limit.
	w < PL	Moisture content estimated to be less than plastic limit.
	w ≈ LL	Moisture content estimated to be near liquid limit.
	w > LL	Moisture content estimated to be wet of liquid limit.
(Coarse Grained Soils)	D	DRY – runs freely through fingers.
	M	MOIST – does not run freely but no free water visible on soil surface.
	W	WET – free water visible on soil surface.
Strength (Consistency) Cohesive Soils	VS	VERY SOFT – unconfined compressive strength ≤ 25kPa.
	S	SOFT – unconfined compressive strength > 25kPa and ≤ 50kPa.
	F	FIRM – unconfined compressive strength > 50kPa and ≤ 100kPa.
	St	STIFF – unconfined compressive strength > 100kPa and ≤ 200kPa.
	VSt	VERY STIFF – unconfined compressive strength > 200kPa and ≤ 400kPa.
	Hd	HARD – unconfined compressive strength > 400kPa.
	Fr	FRIABLE – strength not attainable, soil crumbles.
	( )	Bracketed symbol indicates estimated consistency based on tactile examination or other assessment.

Log Column	Symbol	Definition	Density Index (I_D) Range (%)	SPT 'N' Value Range (Blows/300mm)
Density Index/ Relative Density (Cohesionless Soils)	VL	VERY LOOSE	≤ 15	0 – 4
	L	LOOSE	> 15 and ≤ 35	4 – 10
	MD	MEDIUM DENSE	> 35 and ≤ 65	10 – 30
	D	DENSE	> 65 and ≤ 85	30 – 50
	VD	VERY DENSE	> 85	> 50
	( )	Bracketed symbol indicates estimated density based on ease of drilling or other assessment.		

Log Column	Symbol	Definition
Hand Penetrometer Readings	300 250	Measures reading in kPa of unconfined compressive strength. Numbers indicate individual test results on representative undisturbed material unless noted otherwise.
Remarks	'V' bit	Hardened steel 'V' shaped bit.
	'TC' bit	Twin pronged tungsten carbide bit.
	T_{60}	Penetration of auger string in mm under static load of rig applied by drill head hydraulics without rotation of augers.
	Soil Origin	The geological origin of the soil can generally be described as: RESIDUAL – soil formed directly from insitu weathering of the underlying rock. No visible structure or fabric of the parent rock. EXTREMELY WEATHERED – soil formed directly from insitu weathering of the underlying rock. Material is of soil strength but retains the structure and/or fabric of the parent rock. ALLUVIAL – soil deposited by creeks and rivers. ESTUARINE – soil deposited in coastal estuaries, including sediments caused by inflowing creeks and rivers, and tidal currents. MARINE – soil deposited in a marine environment. AEOLIAN – soil carried and deposited by wind. COLLUVIAL – soil and rock debris transported downslope by gravity, with or without the assistance of flowing water. Colluvium is usually a thick deposit formed from a landslide. The description 'slopewash' is used for thinner surficial deposits. LITTORAL – beach deposited soil.

Classification of Material Weathering

<table>
<tr><th colspan="2">Term</th><th colspan="2">Abbreviation</th><th>Definition</th></tr>
<tr><td colspan="2">Residual Soil</td><td colspan="2">RS</td><td>Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are no longer visible, but the soil has not been significantly transported.</td></tr>
<tr><td colspan="2">Extremely Weathered</td><td colspan="2">XW</td><td>Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are still visible.</td></tr>
<tr><td>Highly Weathered</td><td rowspan="2">Distinctly Weathered (Note 1)</td><td>HW</td><td rowspan="2">DW</td><td>The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable. Rock strength is significantly changed by weathering. Some primary minerals have weathered to clay minerals. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores.</td></tr>
<tr><td>Moderately Weathered</td><td>MW</td><td>The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable, but shows little or no change of strength from fresh rock.</td></tr>
<tr><td colspan="2">Slightly Weathered</td><td colspan="2">SW</td><td>Rock is partially discoloured with staining or bleaching along joints but shows little or no change of strength from fresh rock.</td></tr>
<tr><td colspan="2">Fresh</td><td colspan="2">FR</td><td>Rock shows no sign of decomposition of individual minerals or colour changes.</td></tr>
</table>

NOTE 1: The term 'Distinctly Weathered' is used where it is not practicable to distinguish between 'Highly Weathered' and 'Moderately Weathered' rock. 'Distinctly Weathered' is defined as follows: *'Rock strength usually changed by weathering. The rock may be highly discoloured, usually by iron staining. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores'*. There is some change in rock strength.

Rock Material Strength Classification

Term	Abbreviation	Uniaxial Compressive Strength (MPa)	Guide to Strength: Point Load Strength Index $Is_{(50)}$ (MPa)	Guide to Strength: Field Assessment
Very Low Strength	VL	0.6 to 2	0.03 to 0.1	Material crumbles under firm blows with sharp end of pick; can be peeled with knife; too hard to cut a triaxial sample by hand. Pieces up to 30mm thick can be broken by finger pressure.
Low Strength	L	2 to 6	0.1 to 0.3	Easily scored with a knife; indentations 1mm to 3mm show in the specimen with firm blows of the pick point; has dull sound under hammer. A piece of core 150mm long by 50mm diameter may be broken by hand. Sharp edges of core may be friable and break during handling.
Medium Strength	M	6 to 20	0.3 to 1	Scored with a knife; a piece of core 150mm long by 50mm diameter can be broken by hand with difficulty.
High Strength	H	20 to 60	1 to 3	A piece of core 150mm long by 50mm diameter cannot be broken by hand but can be broken by a pick with a single firm blow; rock rings under hammer.
Very High Strength	VH	60 to 200	3 to 10	Hand specimen breaks with pick after more than one blow; rock rings under hammer.
Extremely High Strength	EH	> 200	> 10	Specimen requires many blows with geological pick to break through intact material; rock rings under hammer.

Appendix D: Laboratory Report(s) & COC Documents

Soils

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

CERTIFICATE OF ANALYSIS 323727

Client Details

Client	JK Environments
Attention	Katrina Taylor
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E35521PT, Blayney**
Number of Samples	46 Soil, 1 Water
Date samples received	22/05/2023
Date completed instructions received	22/05/2023

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	29/05/2023
Date of Issue	29/05/2023

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Asbestos Approved By
Analysed by Asbestos Approved Analyst: Nyovan Moonean
Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By
Dragana Tomas, Senior Chemist
Kyle Gavrily, Senior Chemist
Loren Bardwell, Development Chemist
Lucy Zhu, Asbestos Supervisor

Authorised By
Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		323727-1	323727-3	323727-9	323727-11	323727-12
Your Reference	UNITS	BH101	BH101	BH107	BH107	BH113
Depth		0-0.1	0.5-0.7	0.01-0.46	1.5-1.95	0-0.1
Date Sampled		18/05/2023	18/05/2023	19/05/2023	19/05/2023	19/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	23/05/2023	23/05/2023	23/05/2023	23/05/2023	23/05/2023
Date analysed	-	24/05/2023	24/05/2023	24/05/2023	24/05/2023	24/05/2023
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH 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	%	78	74	72	82	86

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		323727-16	323727-18	323727-20	323727-22	323727-25
Your Reference	UNITS	BH115	BH116	BH116	BH116	BH117
Depth		0.01-0.2	0.015-0.45	1.5-1.95	4.5-4.95	0.01-0.4
Date Sampled		19/05/2023	17/05/2023	17/05/2023	17/05/2023	17/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	23/05/2023	23/05/2023	23/05/2023	23/05/2023	23/05/2023
Date analysed	-	24/05/2023	24/05/2023	24/05/2023	24/05/2023	24/05/2023
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH 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	%	93	82	83	79	75

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		323727-27	323727-28	323727-33	323727-36	323727-38
Your Reference	UNITS	BH117	BH117	BH120	BH120	BH121
Depth		0.7-0.95	1.6-1.95	0-0.1	0.5-0.75	0-0.1
Date Sampled		17/05/2023	17/05/2023	18/05/2023	18/05/2023	18/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	23/05/2023	23/05/2023	23/05/2023	23/05/2023	23/05/2023
Date analysed	-	24/05/2023	24/05/2023	24/05/2023	24/05/2023	24/05/2023
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH 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	%	78	80	91	85	87

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		323727-41	323727-43	323727-44	323727-45	323727-46
Your Reference	UNITS	BH122	BH122	SV1	SDUP101	SDUP103
Depth		0.03-0.4	1.0-1.45	0.5-0.8	-	-
Date Sampled		18/05/2023	18/05/2023	18/05/2023	17/05/2023	18/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	23/05/2023	23/05/2023	23/05/2023	23/05/2023	23/05/2023
Date analysed	-	24/05/2023	24/05/2023	24/05/2023	24/05/2023	24/05/2023
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH 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	%	92	80	83	85	95

svTRH (C10-C40) in Soil						
Our Reference		323727-1	323727-3	323727-9	323727-11	323727-12
Your Reference	UNITS	BH101	BH101	BH107	BH107	BH113
Depth		0-0.1	0.5-0.7	0.01-0.46	1.5-1.95	0-0.1
Date Sampled		18/05/2023	18/05/2023	19/05/2023	19/05/2023	19/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	23/05/2023	23/05/2023	23/05/2023	23/05/2023	23/05/2023
Date analysed	-	24/05/2023	24/05/2023	24/05/2023	24/05/2023	24/05/2023
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<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	<100	<100	<100	<100	<100
TRH >C_{34}-C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	90	87	93	90	88

svTRH (C10-C40) in Soil						
Our Reference		323727-16	323727-18	323727-20	323727-22	323727-25
Your Reference	UNITS	BH115	BH116	BH116	BH116	BH117
Depth		0.01-0.2	0.015-0.45	1.5-1.95	4.5-4.95	0.01-0.4
Date Sampled		19/05/2023	17/05/2023	17/05/2023	17/05/2023	17/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	23/05/2023	23/05/2023	23/05/2023	23/05/2023	23/05/2023
Date analysed	-	24/05/2023	24/05/2023	24/05/2023	24/05/2023	24/05/2023
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<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	<100	<100	<100	<100	<100
TRH >C_{34}-C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	88	72	89	88	88

svTRH (C10-C40) in Soil						
Our Reference		323727-27	323727-28	323727-33	323727-36	323727-38
Your Reference	UNITS	BH117	BH117	BH120	BH120	BH121
Depth		0.7-0.95	1.6-1.95	0-0.1	0.5-0.75	0-0.1
Date Sampled		17/05/2023	17/05/2023	18/05/2023	18/05/2023	18/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	23/05/2023	23/05/2023	23/05/2023	23/05/2023	23/05/2023
Date analysed	-	24/05/2023	24/05/2023	24/05/2023	24/05/2023	24/05/2023
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<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	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	87	88	88	88	89

svTRH (C10-C40) in Soil						
Our Reference		323727-41	323727-43	323727-44	323727-45	323727-46
Your Reference	UNITS	BH122	BH122	SV1	SDUP101	SDUP103
Depth		0.03-0.4	1.0-1.45	0.5-0.8	-	-
Date Sampled		18/05/2023	18/05/2023	18/05/2023	17/05/2023	18/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	23/05/2023	23/05/2023	23/05/2023	23/05/2023	23/05/2023
Date analysed	-	24/05/2023	24/05/2023	24/05/2023	24/05/2023	24/05/2023
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<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	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	94	89	87	88	88

PAHs in Soil						
Our Reference		323727-1	323727-3	323727-9	323727-11	323727-12
Your Reference	UNITS	BH101	BH101	BH107	BH107	BH113
Depth		0-0.1	0.5-0.7	0.01-0.46	1.5-1.95	0-0.1
Date Sampled		18/05/2023	18/05/2023	19/05/2023	19/05/2023	19/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	23/05/2023	23/05/2023	23/05/2023	23/05/2023	23/05/2023
Date analysed	-	24/05/2023	24/05/2023	24/05/2023	24/05/2023	24/05/2023
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	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<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	<0.05	<0.05	<0.05	<0.05	<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	<0.05	<0.05	<0.05	<0.05	<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	%	85	83	84	84	83

PAHs in Soil						
Our Reference		323727-16	323727-18	323727-20	323727-22	323727-25
Your Reference	UNITS	BH115	BH116	BH116	BH116	BH117
Depth		0.01-0.2	0.015-0.45	1.5-1.95	4.5-4.95	0.01-0.4
Date Sampled		19/05/2023	17/05/2023	17/05/2023	17/05/2023	17/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	23/05/2023	23/05/2023	23/05/2023	23/05/2023	23/05/2023
Date analysed	-	24/05/2023	24/05/2023	24/05/2023	24/05/2023	24/05/2023
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	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<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	<0.05	<0.05	<0.05	<0.05	<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	<0.05	<0.05	<0.05	<0.05	<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	%	83	85	84	84	83

PAHs in Soil						
Our Reference		323727-27	323727-28	323727-33	323727-36	323727-38
Your Reference	UNITS	BH117	BH117	BH120	BH120	BH121
Depth		0.7-0.95	1.6-1.95	0-0.1	0.5-0.75	0-0.1
Date Sampled		17/05/2023	17/05/2023	18/05/2023	18/05/2023	18/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	23/05/2023	23/05/2023	23/05/2023	23/05/2023	23/05/2023
Date analysed	-	24/05/2023	24/05/2023	24/05/2023	24/05/2023	24/05/2023
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	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<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	<0.05	<0.05	<0.05	<0.05	<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	<0.05	<0.05	<0.05	<0.05	<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	%	84	80	82	85	84

PAHs in Soil						
Our Reference		323727-41	323727-43	323727-44	323727-45	323727-46
Your Reference	UNITS	BH122	BH122	SV1	SDUP101	SDUP103
Depth		0.03-0.4	1.0-1.45	0.5-0.8	-	-
Date Sampled		18/05/2023	18/05/2023	18/05/2023	17/05/2023	18/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	23/05/2023	23/05/2023	23/05/2023	23/05/2023	23/05/2023
Date analysed	-	24/05/2023	24/05/2023	24/05/2023	24/05/2023	24/05/2023
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	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<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	<0.05	<0.05	<0.05	<0.05	<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	<0.05	<0.05	<0.05	<0.05	<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	%	84	79	82	80	80

Organochlorine Pesticides in soil						
Our Reference		323727-1	323727-9	323727-12	323727-16	323727-18
Your Reference	UNITS	BH101	BH107	BH113	BH115	BH116
Depth		0-0.1	0.01-0.46	0-0.1	0.01-0.2	0.015-0.45
Date Sampled		18/05/2023	19/05/2023	19/05/2023	19/05/2023	17/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	23/05/2023	23/05/2023	23/05/2023	23/05/2023	23/05/2023
Date analysed	-	24/05/2023	24/05/2023	24/05/2023	24/05/2023	24/05/2023
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
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	104	103	101	101	104

Organochlorine Pesticides in soil						
Our Reference		323727-22	323727-25	323727-27	323727-33	323727-38
Your Reference	UNITS	BH116	BH117	BH117	BH120	BH121
Depth		4.5-4.95	0.01-0.4	0.7-0.95	0-0.1	0-0.1
Date Sampled		17/05/2023	17/05/2023	17/05/2023	18/05/2023	18/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	23/05/2023	23/05/2023	23/05/2023	23/05/2023	23/05/2023
Date analysed	-	24/05/2023	24/05/2023	24/05/2023	26/05/2023	24/05/2023
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
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	103	103	103	106	103

Organochlorine Pesticides in soil					
Our Reference		323727-41	323727-44	323727-45	323727-46
Your Reference	UNITS	BH122	SV1	SDUP101	SDUP103
Depth		0.03-0.4	0.5-0.8	-	-
Date Sampled		18/05/2023	18/05/2023	17/05/2023	18/05/2023
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	23/05/2023	23/05/2023	23/05/2023	23/05/2023
Date analysed	-	24/05/2023	24/05/2023	24/05/2023	24/05/2023
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
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	103	100	96	97

Organophosphorus Pesticides						
Our Reference		323727-1	323727-9	323727-12	323727-16	323727-18
Your Reference	UNITS	BH101	BH107	BH113	BH115	BH116
Depth		0-0.1	0.01-0.46	0-0.1	0.01-0.2	0.015-0.45
Date Sampled		18/05/2023	19/05/2023	19/05/2023	19/05/2023	17/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	23/05/2023	23/05/2023	23/05/2023	23/05/2023	23/05/2023
Date analysed	-	24/05/2023	24/05/2023	24/05/2023	24/05/2023	24/05/2023
Azinphos-methyl (Guthion)	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
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	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
Dichlorvos	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
Ethion	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
Parathion	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
Coumaphos	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
Fenamiphos	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
Methidathion	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
Parathion (Methyl)	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
Phosalone	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	104	103	101	101	104

Organophosphorus Pesticides						
Our Reference		323727-22	323727-25	323727-27	323727-33	323727-38
Your Reference	UNITS	BH116	BH117	BH117	BH120	BH121
Depth		4.5-4.95	0.01-0.4	0.7-0.95	0-0.1	0-0.1
Date Sampled		17/05/2023	17/05/2023	17/05/2023	18/05/2023	18/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	23/05/2023	23/05/2023	23/05/2023	23/05/2023	23/05/2023
Date analysed	-	24/05/2023	24/05/2023	24/05/2023	24/05/2023	24/05/2023
Azinphos-methyl (Guthion)	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
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	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
Dichlorvos	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
Ethion	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
Parathion	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
Coumaphos	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
Fenamiphos	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
Methidathion	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
Parathion (Methyl)	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
Phosalone	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	103	103	103	100	103

Organophosphorus Pesticides					
Our Reference		323727-41	323727-44	323727-45	323727-46
Your Reference	UNITS	BH122	SV1	SDUP101	SDUP103
Depth		0.03-0.4	0.5-0.8	-	-
Date Sampled		18/05/2023	18/05/2023	17/05/2023	18/05/2023
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	23/05/2023	23/05/2023	23/05/2023	23/05/2023
Date analysed	-	24/05/2023	24/05/2023	24/05/2023	24/05/2023
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1
Ethion	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
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1
Coumaphos	mg/kg	<0.1	<0.1	<0.1	<0.1
Disulfoton	mg/kg	<0.1	<0.1	<0.1	<0.1
Fenamiphos	mg/kg	<0.1	<0.1	<0.1	<0.1
Fenthion	mg/kg	<0.1	<0.1	<0.1	<0.1
Methidathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Mevinphos	mg/kg	<0.1	<0.1	<0.1	<0.1
Parathion (Methyl)	mg/kg	<0.1	<0.1	<0.1	<0.1
Phorate	mg/kg	<0.1	<0.1	<0.1	<0.1
Phosalone	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	103	100	96	97

PCBs in Soil						
Our Reference		323727-1	323727-9	323727-12	323727-16	323727-18
Your Reference	UNITS	BH101	BH107	BH113	BH115	BH116
Depth		0-0.1	0.01-0.46	0-0.1	0.01-0.2	0.015-0.45
Date Sampled		18/05/2023	19/05/2023	19/05/2023	19/05/2023	17/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	23/05/2023	23/05/2023	23/05/2023	23/05/2023	23/05/2023
Date analysed	-	24/05/2023	24/05/2023	24/05/2023	24/05/2023	24/05/2023
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 TCMX	%	104	103	101	101	104

PCBs in Soil						
Our Reference		323727-22	323727-25	323727-27	323727-33	323727-38
Your Reference	UNITS	BH116	BH117	BH117	BH120	BH121
Depth		4.5-4.95	0.01-0.4	0.7-0.95	0-0.1	0-0.1
Date Sampled		17/05/2023	17/05/2023	17/05/2023	18/05/2023	18/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	23/05/2023	23/05/2023	23/05/2023	23/05/2023	23/05/2023
Date analysed	-	24/05/2023	24/05/2023	24/05/2023	24/05/2023	24/05/2023
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 TCMX	%	103	103	103	100	103

PCBs in Soil					
Our Reference		323727-41	323727-44	323727-45	323727-46
Your Reference	UNITS	BH122	SV1	SDUP101	SDUP103
Depth		0.03-0.4	0.5-0.8	-	-
Date Sampled		18/05/2023	18/05/2023	17/05/2023	18/05/2023
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	23/05/2023	23/05/2023	23/05/2023	23/05/2023
Date analysed	-	24/05/2023	24/05/2023	24/05/2023	24/05/2023
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 TCMX	%	103	100	96	97

Acid Extractable metals in soil						
Our Reference		323727-1	323727-3	323727-9	323727-11	323727-12
Your Reference	UNITS	BH101	BH101	BH107	BH107	BH113
Depth		0-0.1	0.5-0.7	0.01-0.46	1.5-1.95	0-0.1
Date Sampled		18/05/2023	18/05/2023	19/05/2023	19/05/2023	19/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	24/05/2023	24/05/2023	24/05/2023	24/05/2023	24/05/2023
Date analysed	-	26/05/2023	26/05/2023	26/05/2023	26/05/2023	26/05/2023
Arsenic	mg/kg	7	<4	<4	5	120
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	59	11	27	48	43
Copper	mg/kg	37	11	3	12	21
Lead	mg/kg	26	7	3	31	55
Mercury	mg/kg	0.1	<0.1	<0.1	0.2	0.1
Nickel	mg/kg	13	1	14	6	11
Zinc	mg/kg	47	6	5	14	51

Acid Extractable metals in soil						
Our Reference		323727-16	323727-18	323727-20	323727-22	323727-25
Your Reference	UNITS	BH115	BH116	BH116	BH116	BH117
Depth		0.01-0.2	0.015-0.45	1.5-1.95	4.5-4.95	0.01-0.4
Date Sampled		19/05/2023	17/05/2023	17/05/2023	17/05/2023	17/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	24/05/2023	24/05/2023	24/05/2023	24/05/2023	24/05/2023
Date analysed	-	26/05/2023	26/05/2023	26/05/2023	26/05/2023	26/05/2023
Arsenic	mg/kg	<4	4	5	25	10
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	34	120	46	85	280
Copper	mg/kg	5	59	12	98	110
Lead	mg/kg	5	3	19	37	5
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	20	54	5	21	130
Zinc	mg/kg	10	23	15	43	38

Acid Extractable metals in soil						
Our Reference		323727-27	323727-28	323727-33	323727-36	323727-38
Your Reference	UNITS	BH117	BH117	BH120	BH120	BH121
Depth		0.7-0.95	1.6-1.95	0-0.1	0.5-0.75	0-0.1
Date Sampled		17/05/2023	17/05/2023	18/05/2023	18/05/2023	18/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	24/05/2023	24/05/2023	24/05/2023	24/05/2023	24/05/2023
Date analysed	-	26/05/2023	26/05/2023	26/05/2023	26/05/2023	26/05/2023
Arsenic	mg/kg	<4	<4	6	5	85
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	31	18	61	38	31
Copper	mg/kg	12	11	13	15	22
Lead	mg/kg	22	8	18	40	53
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	6	4	6	6	14
Zinc	mg/kg	13	20	13	13	64

Acid Extractable metals in soil						
Our Reference		323727-41	323727-43	323727-44	323727-45	323727-46
Your Reference	UNITS	BH122	BH122	SV1	SDUP101	SDUP103
Depth		0.03-0.4	1.0-1.45	0.5-0.8	-	-
Date Sampled		18/05/2023	18/05/2023	18/05/2023	17/05/2023	18/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	24/05/2023	24/05/2023	24/05/2023	24/05/2023	24/05/2023
Date analysed	-	26/05/2023	26/05/2023	26/05/2023	26/05/2023	26/05/2023
Arsenic	mg/kg	<4	<4	9	10	4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	7	26	39	250	44
Copper	mg/kg	40	9	15	93	38
Lead	mg/kg	2	16	9	6	16
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	2	4	12	110	13
Zinc	mg/kg	4	11	17	34	40

Moisture						
Our Reference		323727-1	323727-3	323727-9	323727-11	323727-12
Your Reference	UNITS	BH101	BH101	BH107	BH107	BH113
Depth		0-0.1	0.5-0.7	0.01-0.46	1.5-1.95	0-0.1
Date Sampled		18/05/2023	18/05/2023	19/05/2023	19/05/2023	19/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	23/05/2023	23/05/2023	23/05/2023	23/05/2023	23/05/2023
Date analysed	-	24/05/2023	24/05/2023	24/05/2023	24/05/2023	24/05/2023
Moisture	%	18	10	4.9	16	13

Moisture						
Our Reference		323727-16	323727-18	323727-20	323727-22	323727-25
Your Reference	UNITS	BH115	BH116	BH116	BH116	BH117
Depth		0.01-0.2	0.015-0.45	1.5-1.95	4.5-4.95	0.01-0.4
Date Sampled		19/05/2023	17/05/2023	17/05/2023	17/05/2023	17/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	23/05/2023	23/05/2023	23/05/2023	23/05/2023	23/05/2023
Date analysed	-	24/05/2023	24/05/2023	24/05/2023	24/05/2023	24/05/2023
Moisture	%	9.0	8.4	17	18	12

Moisture						
Our Reference		323727-27	323727-28	323727-33	323727-36	323727-38
Your Reference	UNITS	BH117	BH117	BH120	BH120	BH121
Depth		0.7-0.95	1.6-1.95	0-0.1	0.5-0.75	0-0.1
Date Sampled		17/05/2023	17/05/2023	18/05/2023	18/05/2023	18/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	23/05/2023	23/05/2023	23/05/2023	23/05/2023	23/05/2023
Date analysed	-	24/05/2023	24/05/2023	24/05/2023	24/05/2023	24/05/2023
Moisture	%	14	17	14	15	17

Moisture						
Our Reference		323727-41	323727-43	323727-44	323727-45	323727-46
Your Reference	UNITS	BH122	BH122	SV1	SDUP101	SDUP103
Depth		0.03-0.4	1.0-1.45	0.5-0.8	-	-
Date Sampled		18/05/2023	18/05/2023	18/05/2023	17/05/2023	18/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	23/05/2023	23/05/2023	23/05/2023	23/05/2023	23/05/2023
Date analysed	-	24/05/2023	24/05/2023	24/05/2023	24/05/2023	24/05/2023
Moisture	%	6.6	12	13	11	17

Asbestos ID - soils NEPM - ASB-001						
Our Reference		323727-1	323727-9	323727-12	323727-16	323727-18
Your Reference	UNITS	BH101	BH107	BH113	BH115	BH116
Depth		0-0.1	0.01-0.46	0-0.1	0.01-0.2	0.015-0.45
Date Sampled		18/05/2023	19/05/2023	19/05/2023	19/05/2023	17/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	25/05/2023	25/05/2023	25/05/2023	25/05/2023	25/05/2023
Sample mass tested	g	715.64	875.9	775.21	869.8	692.67
Sample Description	-	Brown coarse-grained soil & rocks	Beige 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	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	–	–	–	–	–
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01	<0.01	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM - ASB-001						
Our Reference		323727-25	323727-27	323727-33	323727-38	323727-41
Your Reference	UNITS	BH117	BH117	BH120	BH121	BH122
Depth		0.01-0.4	0.7-0.95	0-0.1	0-0.1	0.03-0.4
Date Sampled		17/05/2023	17/05/2023	18/05/2023	18/05/2023	18/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	25/05/2023	25/05/2023	25/05/2023	25/05/2023	25/05/2023
Sample mass tested	g	848.21	279.06	758.56	718.77	1,037.63
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	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	–	–	–	–	–
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01	<0.01	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM - ASB-001		
Our Reference		323727-44
Your Reference	UNITS	SV1
Depth		0.5-0.8
Date Sampled		18/05/2023
Type of sample		Soil
Date analysed	-	25/05/2023
Sample mass tested	g	817.76
Sample Description	-	Pink 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	–
ACM >7mm Estimation*	%(w/w)	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001

vTRH(C6-C10)/BTEXN in Water		
Our Reference		323727-47
Your Reference	UNITS	FR-S101-SPT
Depth		-
Date Sampled		18/05/2023
Type of sample		Water
Date extracted	-	24/05/2023
Date analysed	-	25/05/2023
TRH C_6 - C_9	µg/L	<10
TRH C_6 - C_{10}	µg/L	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Naphthalene	µg/L	<1
Surrogate Dibromofluoromethane	%	105
Surrogate toluene-d8	%	103
Surrogate 4-BFB	%	97

svTRH (C10-C40) in Water		
Our Reference		323727-47
Your Reference	UNITS	FR-S101-SPT
Depth		-
Date Sampled		18/05/2023
Type of sample		Water
Date extracted	-	23/05/2023
Date analysed	-	24/05/2023
TRH C_{10} - C_{14}	µg/L	<50
TRH C_{15} - C_{28}	µg/L	<100
TRH C_{29} - C_{36}	µg/L	<100
Total +ve TRH (C10-C36)	µg/L	<50
TRH >C_{10} - C_{16}	µg/L	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50
TRH >C_{16} - C_{34}	µg/L	<100
TRH >C_{34} - C_{40}	µg/L	<100
Total +ve TRH (>C10-C40)	µg/L	<50
Surrogate o-Terphenyl	%	90

PAHs in Water		
Our Reference		323727-47
Your Reference	UNITS	FR-S101-SPT
Depth		-
Date Sampled		18/05/2023
Type of sample		Water
Date extracted	-	23/05/2023
Date analysed	-	25/05/2023
Naphthalene	µg/L	<0.2
Acenaphthylene	µg/L	<0.1
Acenaphthene	µg/L	<0.1
Fluorene	µg/L	<0.1
Phenanthrene	µg/L	<0.1
Anthracene	µg/L	<0.1
Fluoranthene	µg/L	<0.1
Pyrene	µg/L	<0.1
Benzo(a)anthracene	µg/L	<0.1
Chrysene	µg/L	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2
Benzo(a)pyrene	µg/L	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5
Total +ve PAH's	µg/L	<0.1
Surrogate p-Terphenyl-d14	%	110

Metals in Waters - Acid extractable		
Our Reference		323727-47
Your Reference	UNITS	FR-S101-SPT
Depth		-
Date Sampled		18/05/2023
Type of sample		Water
Date prepared	-	23/05/2023
Date analysed	-	24/05/2023
Arsenic - Total	mg/L	<0.05
Cadmium - Total	mg/L	<0.01
Chromium - Total	mg/L	<0.01
Copper - Total	mg/L	0.07
Lead - Total	mg/L	<0.03
Mercury - Total	mg/L	<0.0005
Nickel - Total	mg/L	<0.02
Zinc - Total	mg/L	<0.02

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) **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-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
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	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.

Method ID	Methodology Summary
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. 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-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
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.
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/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
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	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.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	323727-9
Date extracted	-			23/05/2023	1	23/05/2023	23/05/2023		23/05/2023	23/05/2023
Date analysed	-			24/05/2023	1	24/05/2023	24/05/2023		24/05/2023	24/05/2023
TRH C_6 - C_9	mg/kg	25	Org-023	<25	1	<25	<25	0	120	106
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	1	<25	<25	0	120	106
Benzene	mg/kg	0.2	Org-023	<0.2	1	<0.2	<0.2	0	119	105
Toluene	mg/kg	0.5	Org-023	<0.5	1	<0.5	<0.5	0	115	100
Ethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	128	110
m+p-xylene	mg/kg	2	Org-023	<2	1	<2	<2	0	119	107
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	120	108
Naphthalene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	95	1	78	81	4	105	90

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]	27	23/05/2023	23/05/2023		[NT]	[NT]
Date analysed	-			[NT]	27	24/05/2023	24/05/2023		[NT]	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	[NT]	27	<25	<25	0	[NT]	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	[NT]	27	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	[NT]	27	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	[NT]	27	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	[NT]	27	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	[NT]	27	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-023	[NT]	27	<1	<1	0	[NT]	[NT]
Naphthalene	mg/kg	1	Org-023	[NT]	27	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	27	78	80	3	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	323727-9
Date extracted	-			23/05/2023	1	23/05/2023	23/05/2023		23/05/2023	23/05/2023
Date analysed	-			24/05/2023	1	24/05/2023	24/05/2023		24/05/2023	24/05/2023
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	1	<50	<50	0	123	112
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	1	<100	<100	0	117	105
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	1	<100	<100	0	114	100
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	1	<50	<50	0	123	112
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	1	<100	<100	0	117	105
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	1	<100	<100	0	114	100
Surrogate o-Terphenyl	%		Org-020	73	1	90	88	2	101	99

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	18	23/05/2023	23/05/2023		[NT]	[NT]
Date analysed	-			[NT]	18	24/05/2023	24/05/2023		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	18	<50	<50	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	18	<100	<100	0	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	18	<100	<100	0	[NT]	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	[NT]	18	<50	<50	0	[NT]	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	[NT]	18	<100	<100	0	[NT]	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	[NT]	18	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-020	[NT]	18	72	71	1	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	27	23/05/2023	23/05/2023		[NT]	[NT]
Date analysed	-			[NT]	27	24/05/2023	24/05/2023		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	27	<50	<50	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	27	<100	<100	0	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	27	<100	<100	0	[NT]	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	[NT]	27	<50	<50	0	[NT]	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	[NT]	27	<100	<100	0	[NT]	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	[NT]	27	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-020	[NT]	27	87	86	1	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	323727-9
Date extracted	-			23/05/2023	1	23/05/2023	23/05/2023		23/05/2023	23/05/2023
Date analysed	-			24/05/2023	1	24/05/2023	24/05/2023		24/05/2023	24/05/2023
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	88	86
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	97	95
Fluorene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	88	86
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	88	84
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	<0.1	<0.1	0	88	84
Pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	97	93
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	93	89
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	<0.05	<0.05	0	94	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	87	1	85	82	4	73	70

QUALITY CONTROL: PAHs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	27	23/05/2023	23/05/2023		[NT]	[NT]
Date analysed	-			[NT]	27	24/05/2023	24/05/2023		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-022/025	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-022/025	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-022/025	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	27	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	27	<0.05	<0.05	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	27	84	85	1	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	323727-9
Date extracted	-			23/05/2023	1	23/05/2023	23/05/2023		23/05/2023	23/05/2023
Date analysed	-			24/05/2023	1	24/05/2023	24/05/2023		24/05/2023	24/05/2023
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	96	92
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	92	86
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	101	95
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	101	95
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	86	82
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	92	88
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	114	106
Endrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	100	96
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	86	82
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	101	81
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	107	1	104	101	3	99	95

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	27	23/05/2023	23/05/2023		[NT]	[NT]
Date analysed	-			[NT]	27	24/05/2023	24/05/2023		[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
HCB	mg/kg	0.1	Org-022/025	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-022/025	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	27	103	104	1	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	33	23/05/2023	23/05/2023		[NT]	[NT]
Date analysed	-			[NT]	33	26/05/2023	26/05/2023		[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	33	<0.1	<0.1	0	[NT]	[NT]
HCB	mg/kg	0.1	Org-022/025	[NT]	33	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	33	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	33	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	33	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	33	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	33	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	33	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	33	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	33	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	33	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	33	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	33	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-022/025	[NT]	33	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	33	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	33	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	33	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	33	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	33	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	33	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	33	106	106	0	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides					Duplicate					Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	323727-9
Date extracted	-			23/05/2023	1	23/05/2023	23/05/2023		23/05/2023	23/05/2023
Date analysed	-			24/05/2023	1	24/05/2023	24/05/2023		24/05/2023	24/05/2023
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	98	94
Chlorpyriphos-methyl	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	117	103
Dimethoate	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	94	86
Fenitrothion	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	121	109
Malathion	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	116	105
Parathion	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	121	111
Ronnel	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	91	87
Coumaphos	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Disulfoton	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fenamiphos	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fenthion	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Methidathion	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Mevinphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Parathion (Methyl)	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Phorate	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Phosalone	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	107	1	104	101	3	99	95

QUALITY CONTROL: Organophosphorus Pesticides					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	27	23/05/2023	23/05/2023		[NT]	[NT]
Date analysed	-			[NT]	27	24/05/2023	24/05/2023		[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-021	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-021	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-021	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-021	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-021	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-021	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-021	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-021	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-021	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-021	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-021	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-021	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Coumaphos	mg/kg	0.1	Org-021	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Disulfoton	mg/kg	0.1	Org-021	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Fenamiphos	mg/kg	0.1	Org-021	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Fenthion	mg/kg	0.1	Org-021	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Methidathion	mg/kg	0.1	Org-021	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Mevinphos	mg/kg	0.1	Org-022/025	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Parathion (Methyl)	mg/kg	0.1	Org-021	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Phorate	mg/kg	0.1	Org-021	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Phosalone	mg/kg	0.1	Org-021	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	[NT]	27	103	104	1	[NT]	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	323727-9
Date extracted	-			23/05/2023	1	23/05/2023	23/05/2023		23/05/2023	23/05/2023
Date analysed	-			24/05/2023	1	24/05/2023	24/05/2023		24/05/2023	24/05/2023
Aroclor 1016	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	88	80
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	107	1	104	101	3	99	95

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	27	23/05/2023	23/05/2023		[NT]	[NT]
Date analysed	-			[NT]	27	24/05/2023	24/05/2023		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-021	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	[NT]	27	103	104	1	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	323727-9
Date prepared	-			24/05/2023	1	24/05/2023	24/05/2023		24/05/2023	24/05/2023
Date analysed	-			26/05/2023	1	26/05/2023	26/05/2023		26/05/2023	26/05/2023
Arsenic	mg/kg	4	Metals-020	<4	1	7	4	55	101	105
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	112	103
Chromium	mg/kg	1	Metals-020	<1	1	59	48	21	117	121
Copper	mg/kg	1	Metals-020	<1	1	37	46	22	104	110
Lead	mg/kg	1	Metals-020	<1	1	26	22	17	111	102
Mercury	mg/kg	0.1	Metals-021	<0.1	1	0.1	<0.1	0	109	117
Nickel	mg/kg	1	Metals-020	<1	1	13	15	14	110	108
Zinc	mg/kg	1	Metals-020	<1	1	47	41	14	114	101

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	27	24/05/2023	24/05/2023		[NT]	[NT]
Date analysed	-			[NT]	27	26/05/2023	26/05/2023		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	27	<4	<4	0	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	27	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	27	31	37	18	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	27	12	12	0	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	27	22	21	5	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	27	6	6	0	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	27	13	13	0	[NT]	[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	-			24/05/2023	[NT]	[NT]	[NT]	[NT]	24/05/2023	[NT]
Date analysed	-			25/05/2023	[NT]	[NT]	[NT]	[NT]	25/05/2023	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	101	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	101	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	101	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Naphthalene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	103	[NT]	[NT]	[NT]	[NT]	105	[NT]
Surrogate toluene-d8	%		Org-023	103	[NT]	[NT]	[NT]	[NT]	103	[NT]
Surrogate 4-BFB	%		Org-023	97	[NT]	[NT]	[NT]	[NT]	101	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			23/05/2023	[NT]	[NT]	[NT]	[NT]	23/05/2023	[NT]
Date analysed	-			23/05/2023	[NT]	[NT]	[NT]	[NT]	23/05/2023	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	104	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	112	[NT]
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	100	[NT]
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	104	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	112	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate o-Terphenyl	%		Org-020	86	[NT]	[NT]	[NT]	[NT]	72	[NT]

QUALITY CONTROL: PAHs in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	323727-47
Date extracted	-			23/05/2023	[NT]	[NT]	[NT]	[NT]	23/05/2023	23/05/2023
Date analysed	-			25/05/2023	[NT]	[NT]	[NT]	[NT]	25/05/2023	25/05/2023
Naphthalene	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	94	82
Acenaphthylene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	92	81
Fluorene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	94	83
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	98	83
Anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	98	85
Pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	100	87
Benzo(a)anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	78	65
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	95	76
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	117	[NT]	[NT]	[NT]	[NT]	123	107

QUALITY CONTROL: Metals in Waters - Acid extractable					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			23/05/2023	[NT]	[NT]	[NT]	[NT]	23/05/2023	[NT]
Date analysed	-			24/05/2023	[NT]	[NT]	[NT]	[NT]	24/05/2023	[NT]
Arsenic - Total	mg/L	0.05	Metals-020	<0.05	[NT]	[NT]	[NT]	[NT]	99	[NT]
Cadmium - Total	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	111	[NT]
Chromium - Total	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	117	[NT]
Copper - Total	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	118	[NT]
Lead - Total	mg/L	0.03	Metals-020	<0.03	[NT]	[NT]	[NT]	[NT]	114	[NT]
Mercury - Total	mg/L	0.0005	Metals-021	<0.0005	[NT]	[NT]	[NT]	[NT]	117	[NT]
Nickel - Total	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	117	[NT]
Zinc - Total	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	116	[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

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.

Note: All samples analysed as received. However, sample 323727-27 is below the minimum recommended 500mL sample volume as per National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013.

Envirolab Services Pty Ltd
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SAMPLE RECEIPT ADVICE

Client Details	
Client	JK Environments
Attention	Katrina Taylor

Sample Login Details	
Your reference	E35521PT, Blayney
Envirolab Reference	323727
Date Sample Received	22/05/2023
Date Instructions Received	22/05/2023
Date Results Expected to be Reported	29/05/2023

Sample Condition	
Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	46 Soil, 1 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	5
Cooling Method	Ice Pack
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	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides	PCBs in Soil	Acid Extractable metalsin soil	Asbestos ID - soils NEPM - ASB-001	vTRH(C6-C10)/BTEXN in Water	svTRH (C10-C40) in Water	PAHs in Water	Metals in Waters -Acid extractable	On Hold
BH101-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓					
BH101-0.1-0.4													✓
BH101-0.5-0.7	✓	✓	✓				✓						
BH101-1.7-1.95													✓
BH101-3.0-3.45													✓
BH101-4.5-4.95													✓
BH101-6.0-6.45													✓
BH101-7.5-7.95													✓
BH107-0.01-0.46	✓	✓	✓	✓	✓	✓	✓	✓					
BH107-0.5-0.95													✓
BH107-1.5-1.95	✓	✓	✓				✓						
BH113-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓					
BH113-0.1-0.45													✓
BH113-0.6-0.95													✓
BH113-1.5-1.95													✓
BH115-0.01-0.2	✓	✓	✓	✓	✓	✓	✓	✓					
BH115-0.4-0.5													✓
BH116-0.015-0.45	✓	✓	✓	✓	✓	✓	✓	✓					
BH116-0.5-0.95													✓
BH116-1.5-1.95	✓	✓	✓				✓						
BH116-3.0-3.45													✓
BH116-4.5-4.95	✓	✓	✓	✓	✓	✓	✓						
BH116-6.0-6.45													✓
BH116-7.5-7.95													✓
BH117-0.01-0.4	✓	✓	✓	✓	✓	✓	✓	✓					
BH117-0.5-0.7													✓
BH117-0.7-0.95	✓	✓	✓	✓	✓	✓	✓	✓					
BH117-1.6-1.95	✓	✓	✓				✓						
BH117-3.0-3.4													✓
BH117-4.5-4.8													✓
BH117-6.0-6.45													✓
BH117-7.5-7.95													✓

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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	PCBs in Soil	Acid Extractable metalsin soil	Asbestos ID - soils NEPM - ASB-001	vTRH(C6-C10)/BTEXN in Water	svTRH (C10-C40) in Water	PAHs in Water	Metals in Waters -Acid extractable	On Hold
BH120-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓					
BH120-0.1-03													✓
BH120-0.3-0.45													✓
BH120-0.5-0.75	✓	✓	✓				✓						
BH120-1.5-0.95													✓
BH121-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓					
BH121-0.2-0.95													✓
BH121-0.5-0.95													✓
BH122-0.03-0.4	✓	✓	✓	✓	✓	✓	✓	✓					
BH122-0.4-0.45													✓
BH122-1.0-1.45	✓	✓	✓				✓						
SV1-0.5-0.8	✓	✓	✓	✓	✓	✓	✓	✓					
SDUP101	✓	✓	✓	✓	✓	✓	✓						
SDUP103	✓	✓	✓	✓	✓	✓	✓						
FR-S101-SPT									✓	✓	✓	✓	

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.

SAMPLE AND CHAIN OF CUSTODY FORM

TO: ENVIROLAB SERVICES PTY LTD 12 ASHLEY STREET CHATSWOOD NSW 2067 P: (02) 99106200 F: (02) 99106201 Attention: Aileen	JKE Job Number: E35521PT Date Results Required: STANDARD Page: 1 of 2	**FROM:** JKEnvironments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: Katrina Taylor ktaylor@jkenvironments.com.au

Location: Blayney

Sampler: HW

Sample Preserved in Esky on Ice

Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	#6 - HM/TRH/BTEX	#3 - TRH/BTEXN/PA	Chromium IV	Asbestos (WA 500mL method)	Asbestos (Detection)	pH, CEC and clay content	VOCs (includes BTEX)	TCLP 6 Metals & PAHs	BTEX			
18/05/2023	1	BH101	0-0.1	G, A	0.2	F: Silty Clay	X			X								
18/05/2023	2	BH101	0.1-0.4	G, A	0.2	F: Silty Clay												
18/05/2023	3	BH101	0.5-0.7	G, A	0.1	Silty Clay		X										
18/05/2023	4	BH101	1.7-1.95	G, A	0	Silty Clay												
18/05/2023	5	BH101	3.0-3.45	G, A	0	Silty Clay												
18/05/2023	6	BH101	4.5-4.95	G	0.1	Silty Clay												
18/05/2023	7	BH101	6.0-6.45	G, A	0.1	Silty Gravelly Clay												
18/05/2023	8	BH101	7.5-7.95	G	0	Silty Gravelly Clay												
19/05/2023	9	BH107	0.01-0.46	G, A	0	F: Silty Clayey Sand	X			X								
19/05/2023	10	BH107	0.5-0.95	G, A	0	F: Silty Clayey Sand												
19/05/2023	11	BH107	1.5-1.95	G, A	0	Silty Clay		X										
19/05/2023	12	BH113	0-0.1	G, A	0	F: Silty Clay	X			X								
19/05/2023	13	BH113	0.1-0.45	G, A	0	F: Silty Clay												
19/05/2023	14	BH113	0.6-0.95	G, A	0	Silty Clay												
19/05/2023	15	BH113	1.5-1.95	G, A	0	Silty Clay												
19/05/2023	16	BH115	0.01-0.2	G, A	0	F: Gravelly Clay	X			X								
19/05/2023	17	BH115	0.4-0.5	G, A	0	F: Gravelly Clay												
17/05/2023	18	BH116	0.015-0.45	G, A	0.1	F: Gravelly Clay	X			X								
17/05/2023	19	BH116	0.5-0.95	G, A	0.1	F: Gravelly Clay												
17/05/2023	20	BH116	1.5-1.95	G, A	0.4	Silty Clay		X										
17/05/2023	21	BH116	3.0-3.45	G, A	0	Silty Clay												
17/05/2023	22	BH116	4.5-4.95	G	0	Silty Gravelly Clay	X											
17/05/2023	23	BH116	6.0-6.45	G	0	Silty Clay												
17/05/2023	24	BH116	7.5-7.95	G	0	Silty Clay												
17/05/2023	25	BH117	0.01-0.4	G, A	0	F: Gravelly Clay	X			X								

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200
ENVIROLAB
Job No: 323727
Date Received: 22/5
Time Received: 1445
Received By: CM
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Remarks (comments/detection limits required):	Sample Containers: G - 250mg Glass Jar A - 500mL Ziplock Asbestos Bag

Relinquished By: KT	Date: 22.05.23	Time: 1445	Received By: CM	Date: 22/5

5°C

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD 12 ASHLEY STREET CHATSWOOD NSW 2067 P: (02) 99106200 F: (02) 99106201 Attention: Aileen	JKE Job Number: E35521PT Date Results Required: STANDARD Page: 2 of 2	JKEnvironments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: Katrina Taylor ktaylor@jkenvironments.com.au

Location:	Blayney	Sample Preserved in Esky on Ice
Sampler:	HW	Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	#6 - HM/TRH/BTEX	#3 - TRH/BTEXN/PAH	Chromium IV	Asbestos (WA 500mL method)	Asbestos (Detection)	pH, CEC and clay content	VOCs (includes BTEX)	TCLP 6 Metals & PAHs	BTEX			
17/05/2023	26	BH117	0.5-0.7	G, A	0	F: Gravelly Clay												
17/05/2023	27	BH117	0.7-0.95	G, A	0	F: Gravelly Clay	X			X								
17/05/2023	28	BH117	1.6-1.95	G, A	0	Silty Clay		X										
17/05/2023	29	BH117	3.0-3.4	G	0	Silty Clay												
17/05/2023	30	BH117	4.5-4.8	G	0	Silty Clay												
17/05/2023	31	BH117	6.0-6.45	G	0	Silty Clay												
17/05/2023	32	BH117	7.5-7.95	G	0	Silty Clay												
18/05/2023	33	BH120	0-0.1	G, A	0	F: Silty Clay	X			X								
18/05/2023	34	BH120	0.1-0.3	G, A	0	F: Silty Clay												
18/05/2023	35	BH120	0.3-0.45	G	0	F: Silty Clay												
18/05/2023	36	BH120	0.5-0.75	G, A	0	Silty Clay		X										
18/05/2023	37	BH120	1.5-1.95	G	0	Silty Gravelly Clay												
18/05/2023	38	BH121	0-0.1	G, A	0	F: Silty Clay	X			X								
18/05/2023	39	BH121	0.2-0.45	G, A	0	Silty Clay												
18/05/2023	40	BH121	0.5-0.95	G, A	0	Silty Clay												
18/05/2023	41	BH122	0.03-0.4	G, A	0	F: Gravelly Sand	X			X								
18/05/2023	42	BH122	0.4-0.45	G	0	Silty Clay												
18/05/2023	43	BH122	1.0-1.45	G, A	0	Silty Clay		X										
18/05/2023	44	SV1	0.5-0.8	G, A	0	F: Silty Sand	X			X								
17/05/2023	45	SDUP101	-	G	NA	Soil	X											
17/05/2023	—	SDUP102	-	G	NA	Soil	X		Please send to Melbourne Envirolab									
18/05/2023	46	SDUP103	-	G	NA	Soil	X											
18/05/2023	—	SDUP104	-	G	NA	Soil	X		Please send to Melbourne Envirolab									
18/05/2023	47	FR-S101-SPT	-	#	NA	Water		X										

Remarks (comments/detection limits required):	Sample Containers: G - 250mg Glass Jar A - 500mL Ziplock Asbestos Bag # - 1x500mL amber, 3xV, H

Relinquished By: KT	Date: 22.05.23	Time:	Received By:	Date:

323727 [illegible]

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CERTIFICATE OF ANALYSIS 323727-A

Client Details

Client	JK Environments
Attention	Katrina Taylor
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E35521PT, Blayney**
Number of Samples	additional analysis
Date samples received	22/05/2023
Date completed instructions received	30/05/2023

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	06/06/2023
Date of Issue	06/06/2023

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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
Hannah Nguyen, Metals Supervisor
Kyle Gavrily, Senior Chemist
Loren Bardwell, Development Chemist
Nick Sarlamis, Assistant Operation Manager
Priya Samarawickrama, Senior Chemist

Authorised By
Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		323727-A-14
Your Reference	UNITS	BH113
Depth		0.6-0.95
Date Sampled		19/05/2023
Type of sample		Soil
Date extracted	-	31/05/2023
Date analysed	-	01/06/2023
TRH C_6 - C_9	mg/kg	<25
TRH C_6 - C_{10}	mg/kg	<25
vTPH 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	%	100

svTRH (C10-C40) in Soil		
Our Reference		323727-A-14
Your Reference	UNITS	BH113
Depth		0.6-0.95
Date Sampled		19/05/2023
Type of sample		Soil
Date extracted	-	31/05/2023
Date analysed	-	02/06/2023
TRH C_{10} - C_{14}	mg/kg	<50
TRH C_{15} - C_{28}	mg/kg	<100
TRH C_{29} - C_{36}	mg/kg	<100
Total +ve TRH (C10-C36)	mg/kg	<50
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	<100
TRH >C_{34} -C_{40}	mg/kg	<100
Total +ve TRH (>C10-C40)	mg/kg	<50
Surrogate o-Terphenyl	%	75

PAHs in Soil		
Our Reference		323727-A-14
Your Reference	UNITS	BH113
Depth		0.6-0.95
Date Sampled		19/05/2023
Type of sample		Soil
Date extracted	-	31/05/2023
Date analysed	-	01/06/2023
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	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
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	<0.1
Total +ve PAH's	mg/kg	<0.05
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	%	107

Acid Extractable metals in soil		
Our Reference		323727-A-14
Your Reference	UNITS	BH113
Depth		0.6-0.95
Date Sampled		19/05/2023
Type of sample		Soil
Date prepared	-	31/05/2023
Date analysed	-	01/06/2023
Arsenic	mg/kg	<4
Cadmium	mg/kg	<0.4
Chromium	mg/kg	27
Copper	mg/kg	8
Lead	mg/kg	13
Mercury	mg/kg	<0.1
Nickel	mg/kg	4
Zinc	mg/kg	10

Moisture		
Our Reference		323727-A-14
Your Reference	UNITS	BH113
Depth		0.6-0.95
Date Sampled		19/05/2023
Type of sample		Soil
Date prepared	-	31/05/2023
Date analysed	-	01/06/2023
Moisture	%	13

Misc Soil - Inorg			
Our Reference		323727-A-25	323727-A-45
Your Reference	UNITS	BH117	SDUP101
Depth		0.01-0.4	-
Date Sampled		17/05/2023	17/05/2023
Type of sample		Soil	Soil
Date prepared	-	01/06/2023	01/06/2023
Date analysed	-	01/06/2023	01/06/2023
Hexavalent Chromium, Cr^{6+}	mg/kg	2	1

Misc Inorg - Soil				
Our Reference		323727-A-22	323727-A-25	323727-A-45
Your Reference	UNITS	BH116	BH117	SDUP101
Depth		4.5-4.95	0.01-0.4	-
Date Sampled		17/05/2023	17/05/2023	17/05/2023
Type of sample		Soil	Soil	Soil
Date prepared	-	30/05/2023	30/05/2023	30/05/2023
Date analysed	-	02/06/2023	02/06/2023	02/06/2023
pH 1:5 soil:water	pH Units	6.6	8.0	7.5

CEC				
Our Reference		323727-A-22	323727-A-25	323727-A-45
Your Reference	UNITS	BH116	BH117	SDUP101
Depth		4.5-4.95	0.01-0.4	-
Date Sampled		17/05/2023	17/05/2023	17/05/2023
Type of sample		Soil	Soil	Soil
Date prepared	-	05/06/2023	05/06/2023	05/06/2023
Date analysed	-	06/06/2023	06/06/2023	06/06/2023
Exchangeable Ca	meq/100g	1.8	15	13
Exchangeable K	meq/100g	0.1	0.2	0.2
Exchangeable Mg	meq/100g	2.1	7.1	2.5
Exchangeable Na	meq/100g	0.3	<0.1	<0.1
Cation Exchange Capacity	meq/100g	4.3	22	16

Clay 50-120g			
Our Reference		323727-A-25	323727-A-45
Your Reference	UNITS	BH117	SDUP101
Depth		0.01-0.4	-
Date Sampled		17/05/2023	17/05/2023
Type of sample		Soil	Soil
Date prepared	-	02/06/2023	02/06/2023
Date analysed	-	05/06/2023	05/06/2023
Clay in soils <2µm	% (w/w)	6	17

Metals from Leaching Fluid pH 2.9 or 5				
Our Reference		323727-A-12	323727-A-25	323727-A-45
Your Reference	UNITS	BH113	BH117	SDUP101
Depth		0-0.1	0.01-0.4	-
Date Sampled		19/05/2023	17/05/2023	17/05/2023
Type of sample		Soil	Soil	Soil
Date extracted	-	01/06/2023	01/06/2023	01/06/2023
Date analysed	-	01/06/2023	01/06/2023	01/06/2023
pH of soil for fluid# determ.	pH units	8.2	8.1	8.1
pH of soil TCLP (after HCl)	pH units	1.7	1.7	1.7
Extraction fluid used		1	1	1
pH of final Leachate	pH units	4.9	4.9	5.0
Arsenic	mg/L	<0.05	[NA]	[NA]
Chromium	mg/L	[NA]	<0.01	<0.01
Nickel	mg/L	[NA]	0.03	0.02

Method ID	Methodology Summary
AS1289.3.6.3	Particle Size Distribution using in house method INORG-107 by way of sieving and/or hydrometer sedimentation testing. Clay fraction at <2µm reported.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using AS 4439 and USEPA 1311. 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.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-024	Hexavalent Chromium (Cr6+) - determined colourimetrically. Waters samples are filtered on receipt prior to analysis.
Metals-020	Determination of various metals by ICP-AES.
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.
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.
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).

Method ID	Methodology Summary
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.
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.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			31/05/2023	[NT]	[NT]	[NT]	[NT]	31/05/2023	[NT]
Date analysed	-			01/06/2023	[NT]	[NT]	[NT]	[NT]	01/06/2023	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	121	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	121	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	[NT]	[NT]	[NT]	[NT]	125	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	[NT]	[NT]	[NT]	[NT]	119	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	118	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	122	[NT]
o-Xylene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	120	[NT]
Naphthalene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	102	[NT]	[NT]	[NT]	[NT]	120	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			31/05/2023	[NT]	[NT]	[NT]	[NT]	31/05/2023	[NT]
Date analysed	-			02/06/2023	[NT]	[NT]	[NT]	[NT]	02/06/2023	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	107	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	107	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	86	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	107	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	107	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	86	[NT]
Surrogate o-Terphenyl	%		Org-020	77	[NT]	[NT]	[NT]	[NT]	85	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate					Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			31/05/2023	[NT]	[NT]	[NT]	[NT]	31/05/2023	[NT]
Date analysed	-			01/06/2023	[NT]	[NT]	[NT]	[NT]	01/06/2023	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Fluorene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	90	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	80	[NT]
Anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	85	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	[NT]	[NT]	[NT]	[NT]	92	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	113	[NT]	[NT]	[NT]	[NT]	105	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			31/05/2023	[NT]	[NT]	[NT]	[NT]	31/05/2023	[NT]
Date analysed	-			01/06/2023	[NT]	[NT]	[NT]	[NT]	01/06/2023	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	104	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	109	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	117	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	116	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	112	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	112	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	114	[NT]

QUALITY CONTROL: Misc Soil - Inorg					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			01/06/2023	[NT]	[NT]	[NT]	[NT]	01/06/2023	[NT]
Date analysed	-			01/06/2023	[NT]	[NT]	[NT]	[NT]	01/06/2023	[NT]
Hexavalent Chromium, Cr^{6+}	mg/kg	1	Inorg-024	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]

QUALITY CONTROL: Misc Inorg - Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			30/05/2023	[NT]	[NT]	[NT]	[NT]	30/05/2023	[NT]
Date analysed	-			02/06/2023	[NT]	[NT]	[NT]	[NT]	02/06/2023	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	100	[NT]

QUALITY CONTROL: CEC						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	323727-A-25
Date prepared	-			05/06/2023	22	05/06/2023	05/06/2023		05/06/2023	05/06/2023
Date analysed	-			06/06/2023	22	06/06/2023	06/06/2023		06/06/2023	06/06/2023
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	22	1.8	1.9	5	86	#
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	22	0.1	0.1	0	96	92
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	22	2.1	2.0	5	86	97
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	22	0.3	0.3	0	91	95

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	-			01/06/2023	[NT]	[NT]	[NT]	[NT]	01/06/2023	[NT]
Date analysed	-			01/06/2023	[NT]	[NT]	[NT]	[NT]	01/06/2023	[NT]
Arsenic	mg/L	0.05	Metals-020	<0.05	[NT]	[NT]	[NT]	[NT]	99	[NT]
Chromium	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	88	[NT]
Nickel	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	86	[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

pH/EC
Samples were out of the recommended holding time for this analysis.

CEC - # 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.

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SAMPLE RECEIPT ADVICE

Client Details	
Client	JK Environments
Attention	Katrina Taylor

Sample Login Details	
Your reference	E35521PT, Blayney
Envirolab Reference	323727-A
Date Sample Received	22/05/2023
Date Instructions Received	30/05/2023
Date Results Expected to be Reported	06/06/2023

Sample Condition	
Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	additional analysis
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	5
Cooling Method	Ice Pack
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	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Acid Extractable metalsin soil	Misc Soil - Inorg	Misc Inorg - Soil	CEC	Clay 50-120g	pH of soil for fluid#determ.	pH of soil TCLP (after HCl)	Extraction fluid used	pH of final Leachate	Arsenic	Chromium	Nickel	On Hold
BH101-0-0.1																✓
BH101-0.1-0.4																✓
BH101-0.5-0.7																✓
BH101-1.7-1.95																✓
BH101-3.0-3.45																✓
BH101-4.5-4.95																✓
BH101-6.0-6.45																✓
BH101-7.5-7.95																✓
BH107-0.01-0.46																✓
BH107-0.5-0.95																✓
BH107-1.5-1.95																✓
BH113-0-0.1									✓	✓	✓	✓	✓			
BH113-0.1-0.45																✓
BH113-0.6-0.95	✓	✓	✓	✓												
BH113-1.5-1.95																✓
BH115-0.01-0.2																✓
BH115-0.4-0.5																✓
BH116-0.015-0.45																✓
BH116-0.5-0.95																✓
BH116-1.5-1.95																✓
BH116-3.0-3.45																✓
BH116-4.5-4.95						✓	✓									
BH116-6.0-6.45																✓
BH116-7.5-7.95																✓
BH117-0.01-0.4					✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	
BH117-0.5-0.7																✓
BH117-0.7-0.95																✓
BH117-1.6-1.95																✓
BH117-3.0-3.4																✓
BH117-4.5-4.8																✓
BH117-6.0-6.45																✓
BH117-7.5-7.95																✓

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Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Acid Extractable metalsin soil	Misc Soil - Inorg	Misc Inorg - Soil	CEC	Clay 50-120g	pH of soil for fluid#determ.	pH of soil TCLP (after HCl)	Extraction fluid used	pH of final Leachate	Arsenic	Chromium	Nickel	On Hold
BH120-0-0.1																✓
BH120-0.1-03																✓
BH120-0.3-0.45																✓
BH120-0.5-0.75																✓
BH120-1.5-0.95																✓
BH121-0-0.1																✓
BH121-0.2-0.95																✓
BH121-0.5-0.95																✓
BH122-0.03-0.4																✓
BH122-0.4-0.45																✓
BH122-1.0-1.45																✓
SV1-0.5-0.8																✓
SDUP101					✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	
SDUP103																✓
FR-S101-SPT																✓

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.

Ming To

From: Katrina Taylor <KTaylor@jkenvironments.com.au>
Sent: Tuesday, 30 May 2023 10:24 AM
To: Samplereceipt
Subject: FW: Results for Registration 323727 E35521PT, Blayney
Attachments: 323727-[R00].pdf; 323727-COC.pdf; JK Environment Soil for Envirolab 323727.xlsx; 323727.Excel.xlsx

Ref: 323727-A

Morning,

Please schedule the following on standard TA:

#3
BH113 (0.6-0.95) 14

Chromium 6
BH117 (0.01-0.4) 25
SDUP101 45

TCLP Arsenic
BH113 (0-0.1) 12

TCLP Chromium and Nickel
BH117 (0.01-0.4) 25
SDUP101 45

pH and CEC
BH116 (4.5-4.95) 22

pH, CEC and % Clay content
BH117 (0.01-0.4) 25
SDUP101 45

Regards
Katrina Taylor
Associate | Environmental Scientist
NSW Licensed Asbestos Assessor

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JKEnvironments

From: Greta Petzold <GPetzold@envirolab.com.au>
Sent: Monday, 29 May 2023 5:24 PM
To: Katrina Taylor <KTaylor@jkenvironments.com.au>
Subject: Results for Registration 323727 E35521PT, Blayney

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CERTIFICATE OF ANALYSIS 323727-B

Client Details

Client	JK Environments
Attention	Katrina Taylor
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E35521PT, Blayney**
Number of Samples	additional analysis
Date samples received	22/05/2023
Date completed instructions received	07/06/2023

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	15/06/2023
Date of Issue	15/06/2023

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

Results Approved By
Diego Bigolin, Inorganics Supervisor
Dragana Tomas, Senior Chemist
Hannah Nguyen, Metals Supervisor

Authorised By
Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		323727-B-29
Your Reference	UNITS	BH117
Depth		3.0-3.4
Date Sampled		17/05/2023
Type of sample		Soil
Date extracted	-	08/06/2023
Date analysed	-	13/06/2023
TRH C_6 - C_9	mg/kg	<25
TRH C_6 - C_{10}	mg/kg	<25
vTPH 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	%	87

svTRH (C10-C40) in Soil		
Our Reference		323727-B-29
Your Reference	UNITS	BH117
Depth		3.0-3.4
Date Sampled		17/05/2023
Type of sample		Soil
Date extracted	-	08/06/2023
Date analysed	-	09/06/2023
TRH C_{10} - C_{14}	mg/kg	<50
TRH C_{15} - C_{28}	mg/kg	<100
TRH C_{29} - C_{36}	mg/kg	<100
Total +ve TRH (C10-C36)	mg/kg	<50
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	<100
TRH >C_{34} -C_{40}	mg/kg	<100
Total +ve TRH (>C10-C40)	mg/kg	<50
Surrogate o-Terphenyl	%	102

PAHs in Soil		
Our Reference		323727-B-29
Your Reference	UNITS	BH117
Depth		3.0-3.4
Date Sampled		17/05/2023
Type of sample		Soil
Date extracted	-	08/06/2023
Date analysed	-	13/06/2023
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	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
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	<0.1
Total +ve PAH's	mg/kg	<0.05
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	%	90

Acid Extractable metals in soil				
Our Reference		323727-B-13	323727-B-29	323727-B-48
Your Reference	UNITS	BH113	BH117	BH117 - [TRIPLICATE]
Depth		0.1-0.45	3.0-3.4	3.0-3.4
Date Sampled		19/05/2023	17/05/2023	17/05/2023
Type of sample		Soil	Soil	Soil
Date prepared	-	09/06/2023	09/06/2023	09/06/2023
Date analysed	-	09/06/2023	09/06/2023	09/06/2023
Arsenic	mg/kg	<4	16	11
Cadmium	mg/kg	[NA]	<0.4	<0.4
Chromium	mg/kg	[NA]	54	13
Copper	mg/kg	[NA]	170	200
Lead	mg/kg	[NA]	17	14
Mercury	mg/kg	[NA]	<0.1	<0.1
Nickel	mg/kg	[NA]	17	17
Zinc	mg/kg	[NA]	65	71

Moisture				
Our Reference		323727-B-13	323727-B-18	323727-B-29
Your Reference	UNITS	BH113	BH116	BH117
Depth		0.1-0.45	0.015-0.45	3.0-3.4
Date Sampled		19/05/2023	17/05/2023	17/05/2023
Type of sample		Soil	Soil	Soil
Date prepared	-	08/06/2023	08/06/2023	08/06/2023
Date analysed	-	09/06/2023	09/06/2023	09/06/2023
Moisture	%	12	6.9	23

Misc Soil - Inorg		
Our Reference		323727-B-18
Your Reference	UNITS	BH116
Depth		0.015-0.45
Date Sampled		17/05/2023
Type of sample		Soil
Date prepared	-	09/06/2023
Date analysed	-	09/06/2023
Hexavalent Chromium, Cr^{6+}	mg/kg	120

CEC		
Our Reference		323727-B-18
Your Reference	UNITS	BH116
Depth		0.015-0.45
Date Sampled		17/05/2023
Type of sample		Soil
Date prepared	-	14/06/2023
Date analysed	-	14/06/2023
Exchangeable Ca	meq/100g	22
Exchangeable K	meq/100g	0.2
Exchangeable Mg	meq/100g	5.4
Exchangeable Na	meq/100g	<0.1
Cation Exchange Capacity	meq/100g	28

Metals from Leaching Fluid pH 2.9 or 5		
Our Reference		323727-B-18
Your Reference	UNITS	BH116
Depth		0.015-0.45
Date Sampled		17/05/2023
Type of sample		Soil
Date extracted	-	13/06/2023
Date analysed	-	13/06/2023
pH of soil for fluid# determ.	pH units	9.0
pH of soil TCLP (after HCl)	pH units	1.9
Extraction fluid used		1
pH of final Leachate	pH units	5.1
Chromium	mg/L	<0.01
Nickel	mg/L	0.04

Method ID	Methodology Summary
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using AS 4439 and USEPA 1311. 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.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-024	Hexavalent Chromium (Cr6+) - determined colourimetrically. Waters samples are filtered on receipt prior to analysis.
Metals-020	Determination of various metals by ICP-AES.
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.
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.
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).

Method ID	Methodology Summary
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.
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.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	[NT]
Date extracted	-			08/06/2023	29	08/06/2023	08/06/2023		08/06/2023	[NT]
Date analysed	-			13/06/2023	29	13/06/2023	13/06/2023		13/06/2023	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	<25	29	<25	<25	0	101	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	29	<25	<25	0	101	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	29	<0.2	<0.2	0	94	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	29	<0.5	<0.5	0	90	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	29	<1	<1	0	99	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	29	<2	<2	0	110	[NT]
o-Xylene	mg/kg	1	Org-023	<1	29	<1	<1	0	110	[NT]
Naphthalene	mg/kg	1	Org-023	<1	29	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	77	29	87	75	15	97	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	[NT]
Date extracted	-			08/06/2023	29	08/06/2023	08/06/2023		08/06/2023	[NT]
Date analysed	-			08/06/2023	29	09/06/2023	09/06/2023		08/06/2023	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	29	<50	<50	0	126	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	29	<100	<100	0	120	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	29	<100	<100	0	100	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	29	<50	<50	0	126	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	29	<100	<100	0	120	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	29	<100	<100	0	100	[NT]
Surrogate o-Terphenyl	%		Org-020	105	29	102	106	4	92	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	[NT]
Date extracted	-			08/06/2023	29	08/06/2023	08/06/2023		08/06/2023	[NT]
Date analysed	-			13/06/2023	29	13/06/2023	13/06/2023		13/06/2023	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	29	<0.1	<0.1	0	88	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	29	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	29	<0.1	<0.1	0	93	[NT]
Fluorene	mg/kg	0.1	Org-022/025	<0.1	29	<0.1	<0.1	0	86	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	29	<0.1	<0.1	0	88	[NT]
Anthracene	mg/kg	0.1	Org-022/025	<0.1	29	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	29	<0.1	<0.1	0	88	[NT]
Pyrene	mg/kg	0.1	Org-022/025	<0.1	29	<0.1	<0.1	0	95	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	29	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	29	<0.1	<0.1	0	89	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	29	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	29	<0.05	<0.05	0	94	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	29	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	29	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	29	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	88	29	90	90	0	92	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			09/06/2023	29	09/06/2023	09/06/2023		09/06/2023	[NT]
Date analysed	-			09/06/2023	29	09/06/2023	09/06/2023		09/06/2023	[NT]
Arsenic	mg/kg	4	Metals-020	<4	29	16	11	37	111	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	29	<0.4	<0.4	0	100	[NT]
Chromium	mg/kg	1	Metals-020	<1	29	54	23	81	105	[NT]
Copper	mg/kg	1	Metals-020	<1	29	170	180	6	102	[NT]
Lead	mg/kg	1	Metals-020	<1	29	17	26	42	104	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	29	<0.1	<0.1	0	95	[NT]
Nickel	mg/kg	1	Metals-020	<1	29	17	16	6	106	[NT]
Zinc	mg/kg	1	Metals-020	<1	29	65	61	6	104	[NT]

QUALITY CONTROL: Misc Soil - Inorg					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	[NT]
Date prepared	-			09/06/2023	[NT]	[NT]	[NT]	[NT]	09/06/2023	[NT]
Date analysed	-			09/06/2023	[NT]	[NT]	[NT]	[NT]	09/06/2023	[NT]
Hexavalent Chromium, Cr^{6+}	mg/kg	1	Inorg-024	<1	[NT]	[NT]	[NT]	[NT]	110	[NT]

QUALITY CONTROL: CEC					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			14/06/2023	[NT]	[NT]	[NT]	[NT]	14/06/2023	[NT]
Date analysed	-			14/06/2023	[NT]	[NT]	[NT]	[NT]	14/06/2023	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	115	[NT]
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	111	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	109	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	97	[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	-			13/06/2023	[NT]	[NT]	[NT]	[NT]	13/06/2023	[NT]
Date analysed	-			13/06/2023	[NT]	[NT]	[NT]	[NT]	13/06/2023	[NT]
Chromium	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	98	[NT]
Nickel	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	96	[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

Acid Extractable Metals in Soil: The laboratory RPD acceptance criteria has been exceeded for 323727-B-29 for Cr and Pb. Therefore a triplicate result has been issued as laboratory sample number 323727-B-48.

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SAMPLE RECEIPT ADVICE

Client Details	
Client	JK Environments
Attention	Katrina Taylor

Sample Login Details	
Your reference	E35521PT, Blayney
Envirolab Reference	323727-B
Date Sample Received	22/05/2023
Date Instructions Received	07/06/2023
Date Results Expected to be Reported	15/06/2023

Sample Condition	
Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	additional analysis
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	5
Cooling Method	Ice Pack
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	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Acid Extractable metalsin soil	Misc Soil - Inorg	CEC	pH of soil for fluid#determ.	pH of soil TCLP (after HCl)	Extraction fluid used	pH of final Leachate	Chromium	Nickel	On Hold
BH101-0-0.1													✓
BH101-0.1-0.4													✓
BH101-0.5-0.7													✓
BH101-1.7-1.95													✓
BH101-3.0-3.45													✓
BH101-4.5-4.95													✓
BH101-6.0-6.45													✓
BH101-7.5-7.95													✓
BH107-0.01-0.46													✓
BH107-0.5-0.95													✓
BH107-1.5-1.95													✓
BH113-0-0.1													✓
BH113-0.1-0.45				✓									
BH113-0.6-0.95													✓
BH113-1.5-1.95													✓
BH115-0.01-0.2													✓
BH115-0.4-0.5													✓
BH116-0.015-0.45					✓	✓	✓	✓	✓	✓	✓	✓	
BH116-0.5-0.95													✓
BH116-1.5-1.95													✓
BH116-3.0-3.45													✓
BH116-4.5-4.95													✓
BH116-6.0-6.45													✓
BH116-7.5-7.95													✓
BH117-0.01-0.4													✓
BH117-0.5-0.7													✓
BH117-0.7-0.95													✓
BH117-1.6-1.95													✓
BH117-3.0-3.4	✓	✓	✓	✓									
BH117-4.5-4.8													✓
BH117-6.0-6.45													✓
BH117-7.5-7.95													✓

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customerservice@envirolab.com.au
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Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Acid Extractable metalsin soil	Misc Soil - Inorg	CEC	pH of soil for fluid#determ.	pH of soil TCLP (after HCl)	Extraction fluid used	pH of final Leachate	Chromium	Nickel	On Hold
BH120-0-0.1													✓
BH120-0.1-03													✓
BH120-0.3-0.45													✓
BH120-0.5-0.75													✓
BH120-1.5-0.95													✓
BH121-0-0.1													✓
BH121-0.2-0.95													✓
BH121-0.5-0.95													✓
BH122-0.03-0.4													✓
BH122-0.4-0.45													✓
BH122-1.0-1.45													✓
SV1-0.5-0.8													✓
SDUP101													✓
SDUP103													✓
FR-S101-SPT													✓

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

Additional Info

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.

Ming To

From: Katrina Taylor <KTaylor@jkenvironments.com.au>
Sent: Wednesday, 7 June 2023 10:00 AM
To: Samplereceipt
Subject: FW: Results for Registration 323727-A E35521PT, Blayney
Attachments: 323727-A-[R00].pdf; 323727-A-COC.pdf; JK Environment Soil for Envirolab 323727-A.xlsx; 323727-A.Excel.xlsx

Ref: 323727-B.
TAT: Standard.
Due: 15/06/2023
MT

Morning,

Please schedule the following on standard TA:

BH113 (0.1-0.45) - As 13
BH116 (0.015-0.45) – Cr VI, CEC & TCLP Cr + Ni 18
BH117 (3-3.4) - #3 29

Thank you.

Regards
Katrina Taylor
Associate | Environmental Scientist
NSW Licensed Asbestos Assessor

T: +612 9888 5000
D: 0418 481 628
E: KTaylor@jkenvironments.com.au
www.jkenvironments.com.au

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JKEnvironments

From: Greta Petzold <GPetzold@envirolab.com.au>
Sent: Tuesday, 6 June 2023 6:29 PM
To: Katrina Taylor <KTaylor@jkenvironments.com.au>
Subject: Results for Registration 323727-A E35521PT, Blayney

Please refer to attached for:
a copy of the Certificate of Analysis
a copy of the COC/paperwork received from you
an Excel or .csv file containing the results

Please note that a hard copy will not be posted.

Enquiries should be made directly to:
customerservice@envirolab.com.au

How did we do? Send Feedback

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CERTIFICATE OF ANALYSIS 323727-C

Client Details

Client	JK Environments
Attention	Katrina Taylor
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E35521PT, Blayney**
Number of Samples	additional analysis
Date samples received	22/05/2023
Date completed instructions received	20/06/2023

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	21/06/2023
Date of Issue	21/06/2023

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Results Approved By
Diego Bigolin, Inorganics Supervisor
Hannah Nguyen, Metals Supervisor

Authorised By
Nancy Zhang, Laboratory Manager

Misc Inorg - Soil		
Our Reference		323727-C-29
Your Reference	UNITS	BH117
Depth		3.0-3.4
Date Sampled		17/05/2023
Type of sample		Soil
Date prepared	-	21/06/2023
Date analysed	-	21/06/2023
pH 1:5 soil:water	pH Units	5.9

CEC		
Our Reference		323727-C-29
Your Reference	UNITS	BH117
Depth		3.0-3.4
Date Sampled		17/05/2023
Type of sample		Soil
Date prepared	-	21/06/2023
Date analysed	-	21/06/2023
Exchangeable Ca	meq/100g	8.2
Exchangeable K	meq/100g	0.7
Exchangeable Mg	meq/100g	1.0
Exchangeable Na	meq/100g	1.1
Cation Exchange Capacity	meq/100g	11

Method ID	Methodology Summary
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Metals-020	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-OES analytical finish.

QUALITY CONTROL: Misc Inorg - Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			21/06/2023	[NT]	[NT]	[NT]	[NT]	21/06/2023	[NT]
Date analysed	-			21/06/2023	[NT]	[NT]	[NT]	[NT]	21/06/2023	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	100	[NT]

QUALITY CONTROL: CEC					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			21/06/2023	[NT]	[NT]	[NT]	[NT]	21/06/2023	[NT]
Date analysed	-			21/06/2023	[NT]	[NT]	[NT]	[NT]	21/06/2023	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	116	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	99	[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.

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SAMPLE RECEIPT ADVICE

Client Details	
Client	JK Environments
Attention	Katrina Taylor

Sample Login Details	
Your reference	E35521PT, Blayney
Envirolab Reference	323727-C
Date Sample Received	22/05/2023
Date Instructions Received	20/06/2023
Date Results Expected to be Reported	21/06/2023

Sample Condition	
Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	additional analysis
Turnaround Time Requested	1 day
Temperature on Receipt (°C)	5
Cooling Method	Ice Pack
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	Misc Inorg - Soil	CEC	On Hold
BH101-0-0.1			✓
BH101-0.1-0.4			✓
BH101-0.5-0.7			✓
BH101-1.7-1.95			✓
BH101-3.0-3.45			✓
BH101-4.5-4.95			✓
BH101-6.0-6.45			✓
BH101-7.5-7.95			✓
BH107-0.01-0.46			✓
BH107-0.5-0.95			✓
BH107-1.5-1.95			✓
BH113-0-0.1			✓
BH113-0.1-0.45			✓
BH113-0.6-0.95			✓
BH113-1.5-1.95			✓
BH115-0.01-0.2			✓
BH115-0.4-0.5			✓
BH116-0.015-0.45			✓
BH116-0.5-0.95			✓
BH116-1.5-1.95			✓
BH116-3.0-3.45			✓
BH116-4.5-4.95			✓
BH116-6.0-6.45			✓
BH116-7.5-7.95			✓
BH117-0.01-0.4			✓
BH117-0.5-0.7			✓
BH117-0.7-0.95			✓
BH117-1.6-1.95			✓
BH117-3.0-3.4	✓	✓	
BH117-4.5-4.8			✓
BH117-6.0-6.45			✓
BH117-7.5-7.95			✓

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customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	Misc Inorg - Soil	CEC	On Hold
BH120-0-0.1			✓
BH120-0.1-03			✓
BH120-0.3-0.45			✓
BH120-0.5-0.75			✓
BH120-1.5-0.95			✓
BH121-0-0.1			✓
BH121-0.2-0.95			✓
BH121-0.5-0.95			✓
BH122-0.03-0.4			✓
BH122-0.4-0.45			✓
BH122-1.0-1.45			✓
SV1-0.5-0.8			✓
SDUP101			✓
SDUP103			✓
FR-S101-SPT			✓

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.

Ming To

From: Katrina Taylor <KTaylor@jkenvironments.com.au>
Sent: Tuesday, 20 June 2023 1:31 PM
To: Ming To; Samplereceipt
Subject: FW: Results for Registration 323727-B E35521PT, Blayney
Attachments: 323727-B-[R00].pdf; 323727-B-COC.pdf; JK Environment Soil for Envirolab 323727-B.xlsx; 323727-B.Excel.xlsx

CAUTION: This email originated from outside of the organisation. Do not act on instructions, click links or open attachments unless you recognise the sender and know the content is authentic and safe.

Ref: 323727-C
TAT: 1 day.
Due: 21/06/2023
MT

Afternoon,

29

Please schedule BH117 (3-3.4) for pH and CEC on 24hr TA.

Thank you.

Regards
Katrina Taylor
Associate | Environmental Scientist
NSW Licensed Asbestos Assessor

T: +612 9888 5000
D: 0418 481 628
E: KTaylor@jkenvironments.com.au
www.jkenvironments.com.au

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NORTH RYDE BC NSW 1670
115 Wicks Road
MACQUARIE PARK NSW 2113

JKEnvironments

From: Nancy Zhang <NZhang@envirolab.com.au>
Sent: Thursday, 15 June 2023 3:57 PM
To: Katrina Taylor <KTaylor@jkenvironments.com.au>
Subject: Results for Registration 323727-B E35521PT, Blayney

Please refer to attached for:
a copy of the Certificate of Analysis
a copy of the COC/paperwork received from you
an Excel or .csv file containing the results

Please note that a hard copy will not be posted.

Enquiries should be made directly to:
customerservice@envirolab.com.au

How did we do? Send Feedback

Kind Regards,

Nancy Zhang | Laboratory Manager, Sydney | Envirolab Services

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customerservice@envirolab.com.au
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CERTIFICATE OF ANALYSIS 324186

Client Details

Client	JK Environments
Attention	Katrina Taylor
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E35521PT, Blayney**
Number of Samples	30 Soil, 1 Water
Date samples received	26/05/2023
Date completed instructions received	26/05/2023

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	02/06/2023
Date of Issue	02/06/2023

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Asbestos Approved By
Analysed by Asbestos Approved Analyst: Anthony Clark
Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By
Kyle Gavrily, Senior Chemist
Liam Timmins, Organics Supervisor
Loren Bardwell, Development Chemist
Lucy Zhu, Asbestos Supervisor

Authorised By
Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		324186-1	324186-3	324186-4	324186-6	324186-8
Your Reference	UNITS	BH102	BH103	BH104	BH105	BH106
Depth		0-0.2	0-0.2	0-0.2	0-0.2	0-0.2
Date Sampled		22/05/2023	22/05/2023	22/05/2023	22/05/2023	23/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/05/2023	29/05/2023	29/05/2023	29/05/2023	29/05/2023
Date analysed	-	30/05/2023	30/05/2023	30/05/2023	30/05/2023	30/05/2023
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH 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	%	70	84	82	75	83

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		324186-10	324186-12	324186-14	324186-15	324186-17
Your Reference	UNITS	BH108	BH109	BH110	BH111	BH112
Depth		0-0.2	0-0.2	0-0.2	0-0.2	0-0.2
Date Sampled		23/05/2023	22/05/2023	22/05/2023	22/05/2023	23/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/05/2023	29/05/2023	29/05/2023	29/05/2023	29/05/2023
Date analysed	-	30/05/2023	30/05/2023	30/05/2023	30/05/2023	30/05/2023
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH 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	%	76	76	85	76	86

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		324186-20	324186-22	324186-24	324186-26	324186-30
Your Reference	UNITS	BH114	BH118	BH119	SDUP1	TB1
Depth		0-0.2	0-0.2	0-0.2	-	-
Date Sampled		23/05/2023	23/05/2023	23/05/2023	22/05/2023	22/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/05/2023	29/05/2023	29/05/2023	29/05/2023	29/05/2023
Date analysed	-	30/05/2023	30/05/2023	30/05/2023	30/05/2023	30/05/2023
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH 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	%	81	77	79	87	86

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		324186-31
Your Reference	UNITS	TS1
Depth		-
Date Sampled		22/05/2023
Type of sample		Soil
Date extracted	-	29/05/2023
Date analysed	-	30/05/2023
Benzene	mg/kg	100%
Toluene	mg/kg	99%
Ethylbenzene	mg/kg	100%
m+p-xylene	mg/kg	100%
o-Xylene	mg/kg	100%
Surrogate aaa-Trifluorotoluene	%	96

svTRH (C10-C40) in Soil						
Our Reference		324186-1	324186-3	324186-4	324186-6	324186-8
Your Reference	UNITS	BH102	BH103	BH104	BH105	BH106
Depth		0-0.2	0-0.2	0-0.2	0-0.2	0-0.2
Date Sampled		22/05/2023	22/05/2023	22/05/2023	22/05/2023	23/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/05/2023	29/05/2023	29/05/2023	29/05/2023	29/05/2023
Date analysed	-	29/05/2023	29/05/2023	29/05/2023	29/05/2023	29/05/2023
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<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	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	90	92	90	91	89

svTRH (C10-C40) in Soil						
Our Reference		324186-10	324186-12	324186-14	324186-15	324186-17
Your Reference	UNITS	BH108	BH109	BH110	BH111	BH112
Depth		0-0.2	0-0.2	0-0.2	0-0.2	0-0.2
Date Sampled		23/05/2023	22/05/2023	22/05/2023	22/05/2023	23/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/05/2023	29/05/2023	29/05/2023	29/05/2023	29/05/2023
Date analysed	-	29/05/2023	29/05/2023	29/05/2023	29/05/2023	29/05/2023
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<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	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	88	88	88	89	89

svTRH (C10-C40) in Soil					
Our Reference		324186-20	324186-22	324186-24	324186-26
Your Reference	UNITS	BH114	BH118	BH119	SDUP1
Depth		0-0.2	0-0.2	0-0.2	-
Date Sampled		23/05/2023	23/05/2023	23/05/2023	22/05/2023
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	29/05/2023	29/05/2023	29/05/2023	29/05/2023
Date analysed	-	29/05/2023	29/05/2023	29/05/2023	29/05/2023
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50
Surrogate o-Terphenyl	%	89	88	93	88

PAHs in Soil						
Our Reference		324186-1	324186-3	324186-4	324186-6	324186-8
Your Reference	UNITS	BH102	BH103	BH104	BH105	BH106
Depth		0-0.2	0-0.2	0-0.2	0-0.2	0-0.2
Date Sampled		22/05/2023	22/05/2023	22/05/2023	22/05/2023	23/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/05/2023	29/05/2023	29/05/2023	29/05/2023	29/05/2023
Date analysed	-	29/05/2023	29/05/2023	29/05/2023	29/05/2023	29/05/2023
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	<0.1	<0.1	<0.1	0.1	<0.1
Pyrene	mg/kg	<0.1	<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	<0.05	<0.05	<0.05	0.1	<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	<0.05	<0.05	<0.05	0.59	<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	%	97	97	95	101	95

PAHs in Soil						
Our Reference		324186-10	324186-12	324186-14	324186-15	324186-17
Your Reference	UNITS	BH108	BH109	BH110	BH111	BH112
Depth		0-0.2	0-0.2	0-0.2	0-0.2	0-0.2
Date Sampled		23/05/2023	22/05/2023	22/05/2023	22/05/2023	23/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/05/2023	29/05/2023	29/05/2023	29/05/2023	29/05/2023
Date analysed	-	29/05/2023	29/05/2023	29/05/2023	29/05/2023	29/05/2023
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	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<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	<0.05	0.07	<0.05	<0.05	<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	<0.05	0.07	<0.05	<0.05	<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	%	97	89	94	95	95

PAHs in Soil					
Our Reference		324186-20	324186-22	324186-24	324186-26
Your Reference	UNITS	BH114	BH118	BH119	SDUP1
Depth		0-0.2	0-0.2	0-0.2	-
Date Sampled		23/05/2023	23/05/2023	23/05/2023	22/05/2023
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	29/05/2023	29/05/2023	29/05/2023	29/05/2023
Date analysed	-	29/05/2023	29/05/2023	29/05/2023	29/05/2023
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	97	94	95	97

Organochlorine Pesticides in soil						
Our Reference		324186-1	324186-3	324186-4	324186-6	324186-8
Your Reference	UNITS	BH102	BH103	BH104	BH105	BH106
Depth		0-0.2	0-0.2	0-0.2	0-0.2	0-0.2
Date Sampled		22/05/2023	22/05/2023	22/05/2023	22/05/2023	23/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/05/2023	29/05/2023	29/05/2023	29/05/2023	29/05/2023
Date analysed	-	29/05/2023	29/05/2023	29/05/2023	29/05/2023	29/05/2023
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
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	109	111	108	113	103

Organochlorine Pesticides in soil						
Our Reference		324186-10	324186-12	324186-14	324186-15	324186-17
Your Reference	UNITS	BH108	BH109	BH110	BH111	BH112
Depth		0-0.2	0-0.2	0-0.2	0-0.2	0-0.2
Date Sampled		23/05/2023	22/05/2023	22/05/2023	22/05/2023	23/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/05/2023	29/05/2023	29/05/2023	29/05/2023	29/05/2023
Date analysed	-	29/05/2023	02/06/2023	02/06/2023	29/05/2023	29/05/2023
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	0.2	<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
Total +ve DDT+DDD+DDE	mg/kg	<0.1	0.2	<0.1	<0.1	<0.1
Surrogate TCMX	%	107	108	107	109	109

Organochlorine Pesticides in soil					
Our Reference		324186-20	324186-22	324186-24	324186-26
Your Reference	UNITS	BH114	BH118	BH119	SDUP1
Depth		0-0.2	0-0.2	0-0.2	-
Date Sampled		23/05/2023	23/05/2023	23/05/2023	22/05/2023
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	29/05/2023	29/05/2023	29/05/2023	29/05/2023
Date analysed	-	29/05/2023	29/05/2023	29/05/2023	29/05/2023
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
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	109	105	103	111

Organophosphorus Pesticides						
Our Reference		324186-1	324186-3	324186-4	324186-6	324186-8
Your Reference	UNITS	BH102	BH103	BH104	BH105	BH106
Depth		0-0.2	0-0.2	0-0.2	0-0.2	0-0.2
Date Sampled		22/05/2023	22/05/2023	22/05/2023	22/05/2023	23/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/05/2023	29/05/2023	29/05/2023	29/05/2023	29/05/2023
Date analysed	-	29/05/2023	29/05/2023	29/05/2023	29/05/2023	29/05/2023
Azinphos-methyl (Guthion)	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
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	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
Dichlorvos	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
Ethion	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
Parathion	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
Coumaphos	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
Fenamiphos	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
Methidathion	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
Parathion (Methyl)	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
Phosalone	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	109	111	108	113	103

Organophosphorus Pesticides						
Our Reference		324186-10	324186-12	324186-14	324186-15	324186-17
Your Reference	UNITS	BH108	BH109	BH110	BH111	BH112
Depth		0-0.2	0-0.2	0-0.2	0-0.2	0-0.2
Date Sampled		23/05/2023	22/05/2023	22/05/2023	22/05/2023	23/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/05/2023	29/05/2023	29/05/2023	29/05/2023	29/05/2023
Date analysed	-	29/05/2023	29/05/2023	29/05/2023	29/05/2023	29/05/2023
Azinphos-methyl (Guthion)	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
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	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
Dichlorvos	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
Ethion	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
Parathion	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
Coumaphos	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
Fenamiphos	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
Methidathion	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
Parathion (Methyl)	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
Phosalone	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	107	100	107	109	109

Organophosphorus Pesticides					
Our Reference		324186-20	324186-22	324186-24	324186-26
Your Reference	UNITS	BH114	BH118	BH119	SDUP1
Depth		0-0.2	0-0.2	0-0.2	-
Date Sampled		23/05/2023	23/05/2023	23/05/2023	22/05/2023
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	29/05/2023	29/05/2023	29/05/2023	29/05/2023
Date analysed	-	29/05/2023	29/05/2023	29/05/2023	29/05/2023
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1
Ethion	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
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1
Coumaphos	mg/kg	<0.1	<0.1	<0.1	<0.1
Disulfoton	mg/kg	<0.1	<0.1	<0.1	<0.1
Fenamiphos	mg/kg	<0.1	<0.1	<0.1	<0.1
Fenthion	mg/kg	<0.1	<0.1	<0.1	<0.1
Methidathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Mevinphos	mg/kg	<0.1	<0.1	<0.1	<0.1
Parathion (Methyl)	mg/kg	<0.1	<0.1	<0.1	<0.1
Phorate	mg/kg	<0.1	<0.1	<0.1	<0.1
Phosalone	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	109	105	103	111

PCBs in Soil						
Our Reference		324186-1	324186-3	324186-4	324186-6	324186-8
Your Reference	UNITS	BH102	BH103	BH104	BH105	BH106
Depth		0-0.2	0-0.2	0-0.2	0-0.2	0-0.2
Date Sampled		22/05/2023	22/05/2023	22/05/2023	22/05/2023	23/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/05/2023	29/05/2023	29/05/2023	29/05/2023	29/05/2023
Date analysed	-	29/05/2023	29/05/2023	29/05/2023	29/05/2023	29/05/2023
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 TCMX	%	109	111	108	113	103

PCBs in Soil						
Our Reference		324186-10	324186-12	324186-14	324186-15	324186-17
Your Reference	UNITS	BH108	BH109	BH110	BH111	BH112
Depth		0-0.2	0-0.2	0-0.2	0-0.2	0-0.2
Date Sampled		23/05/2023	22/05/2023	22/05/2023	22/05/2023	23/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/05/2023	29/05/2023	29/05/2023	29/05/2023	29/05/2023
Date analysed	-	29/05/2023	29/05/2023	29/05/2023	29/05/2023	29/05/2023
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 TCMX	%	107	100	107	109	109

PCBs in Soil					
Our Reference		324186-20	324186-22	324186-24	324186-26
Your Reference	UNITS	BH114	BH118	BH119	SDUP1
Depth		0-0.2	0-0.2	0-0.2	-
Date Sampled		23/05/2023	23/05/2023	23/05/2023	22/05/2023
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	29/05/2023	29/05/2023	29/05/2023	29/05/2023
Date analysed	-	29/05/2023	29/05/2023	29/05/2023	29/05/2023
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 TCMX	%	109	105	103	111

Acid Extractable metals in soil						
Our Reference		324186-1	324186-3	324186-4	324186-6	324186-8
Your Reference	UNITS	BH102	BH103	BH104	BH105	BH106
Depth		0-0.2	0-0.2	0-0.2	0-0.2	0-0.2
Date Sampled		22/05/2023	22/05/2023	22/05/2023	22/05/2023	23/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	30/05/2023	30/05/2023	30/05/2023	30/05/2023	30/05/2023
Date analysed	-	30/05/2023	30/05/2023	30/05/2023	30/05/2023	30/05/2023
Arsenic	mg/kg	<4	4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	35	51	33	13	39
Copper	mg/kg	28	30	40	24	17
Lead	mg/kg	13	16	11	47	13
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	11	14	8	6	7
Zinc	mg/kg	38	32	31	74	19

Acid Extractable metals in soil						
Our Reference		324186-10	324186-12	324186-14	324186-15	324186-17
Your Reference	UNITS	BH108	BH109	BH110	BH111	BH112
Depth		0-0.2	0-0.2	0-0.2	0-0.2	0-0.2
Date Sampled		23/05/2023	22/05/2023	22/05/2023	22/05/2023	23/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	30/05/2023	30/05/2023	30/05/2023	30/05/2023	30/05/2023
Date analysed	-	30/05/2023	30/05/2023	30/05/2023	30/05/2023	30/05/2023
Arsenic	mg/kg	4	26	<4	10	79
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	0.5
Chromium	mg/kg	14	17	42	45	66
Copper	mg/kg	17	52	48	30	36
Lead	mg/kg	23	37	13	20	64
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	0.4
Nickel	mg/kg	6	11	7	20	52
Zinc	mg/kg	47	100	49	46	98

Acid Extractable metals in soil					
Our Reference		324186-20	324186-22	324186-24	324186-26
Your Reference	UNITS	BH114	BH118	BH119	SDUP1
Depth		0-0.2	0-0.2	0-0.2	-
Date Sampled		23/05/2023	23/05/2023	23/05/2023	22/05/2023
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	30/05/2023	30/05/2023	30/05/2023	30/05/2023
Date analysed	-	30/05/2023	30/05/2023	30/05/2023	30/05/2023
Arsenic	mg/kg	4	<4	<4	5
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	19	15	33	38
Copper	mg/kg	8	16	26	35
Lead	mg/kg	9	16	21	13
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	7	5	8	10
Zinc	mg/kg	12	21	23	34

Moisture						
Our Reference		324186-1	324186-3	324186-4	324186-6	324186-8
Your Reference	UNITS	BH102	BH103	BH104	BH105	BH106
Depth		0-0.2	0-0.2	0-0.2	0-0.2	0-0.2
Date Sampled		22/05/2023	22/05/2023	22/05/2023	22/05/2023	23/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	29/05/2023	29/05/2023	29/05/2023	29/05/2023	29/05/2023
Date analysed	-	30/05/2023	30/05/2023	30/05/2023	30/05/2023	30/05/2023
Moisture	%	19	19	21	22	16

Moisture						
Our Reference		324186-10	324186-12	324186-14	324186-15	324186-17
Your Reference	UNITS	BH108	BH109	BH110	BH111	BH112
Depth		0-0.2	0-0.2	0-0.2	0-0.2	0-0.2
Date Sampled		23/05/2023	22/05/2023	22/05/2023	22/05/2023	23/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	29/05/2023	29/05/2023	29/05/2023	29/05/2023	29/05/2023
Date analysed	-	30/05/2023	30/05/2023	30/05/2023	30/05/2023	30/05/2023
Moisture	%	20	16	13	14	15

Moisture					
Our Reference		324186-20	324186-22	324186-24	324186-26
Your Reference	UNITS	BH114	BH118	BH119	SDUP1
Depth		0-0.2	0-0.2	0-0.2	-
Date Sampled		23/05/2023	23/05/2023	23/05/2023	22/05/2023
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	29/05/2023	29/05/2023	29/05/2023	29/05/2023
Date analysed	-	30/05/2023	30/05/2023	30/05/2023	30/05/2023
Moisture	%	7.0	17	18	22

Asbestos ID - soils NEPM - ASB-001						
Our Reference		324186-1	324186-3	324186-4	324186-6	324186-8
Your Reference	UNITS	BH102	BH103	BH104	BH105	BH106
Depth		0-0.2	0-0.2	0-0.2	0-0.2	0-0.2
Date Sampled		22/05/2023	22/05/2023	22/05/2023	22/05/2023	23/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	30/05/2023	30/05/2023	30/05/2023	30/05/2023	30/05/2023
Sample mass tested	g	511.98	455.81	466.76	442.96	373.51
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	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	–	–	–	–	–
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01	<0.01	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM - ASB-001						
Our Reference		324186-10	324186-12	324186-14	324186-15	324186-17
Your Reference	UNITS	BH108	BH109	BH110	BH111	BH112
Depth		0-0.2	0-0.2	0-0.2	0-0.2	0-0.2
Date Sampled		23/05/2023	22/05/2023	22/05/2023	22/05/2023	23/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	30/05/2023	30/05/2023	30/05/2023	30/05/2023	30/05/2023
Sample mass tested	g	537.93	547.95	630.28	477.82	600.88
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Red 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	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	–	–	–	–	–
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01	<0.01	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM - ASB-001				
Our Reference		324186-20	324186-22	324186-24
Your Reference	UNITS	BH114	BH118	BH119
Depth		0-0.2	0-0.2	0-0.2
Date Sampled		23/05/2023	23/05/2023	23/05/2023
Type of sample		Soil	Soil	Soil
Date analysed	-	30/05/2023	30/05/2023	30/05/2023
Sample mass tested	g	631.76	413.6	461.19
Sample Description	-	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	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
Total Asbestos#1	g/kg	<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
ACM >7mm Estimation*	g	–	–	–
FA and AF Estimation*	g	–	–	–
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001

vTRH(C6-C10)/BTEXN in Water		
Our Reference		324186-29
Your Reference	UNITS	FR-AUGER
Depth		-
Date Sampled		22/05/2023
Type of sample		Water
Date extracted	-	29/05/2023
Date analysed	-	30/05/2023
TRH C_6 - C_9	µg/L	32
TRH C_6 - C_{10}	µg/L	39
TRH C_6 - C_{10} less BTEX (F1)	µg/L	39
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Naphthalene	µg/L	<1
Surrogate Dibromofluoromethane	%	124
Surrogate toluene-d8	%	113
Surrogate 4-BFB	%	103

svTRH (C10-C40) in Water		
Our Reference		324186-29
Your Reference	UNITS	FR-AUGER
Depth		-
Date Sampled		22/05/2023
Type of sample		Water
Date extracted	-	29/05/2023
Date analysed	-	29/05/2023
TRH C_{10} - C_{14}	µg/L	<50
TRH C_{15} - C_{28}	µg/L	<100
TRH C_{29} - C_{36}	µg/L	<100
Total +ve TRH (C10-C36)	µg/L	<50
TRH >C_{10} - C_{16}	µg/L	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50
TRH >C_{16} - C_{34}	µg/L	<100
TRH >C_{34} - C_{40}	µg/L	<100
Total +ve TRH (>C10-C40)	µg/L	<50
Surrogate o-Terphenyl	%	77

PAHs in Water		
Our Reference		324186-29
Your Reference	UNITS	FR-AUGER
Depth		-
Date Sampled		22/05/2023
Type of sample		Water
Date extracted	-	29/05/2023
Date analysed	-	29/05/2023
Naphthalene	µg/L	<2
Acenaphthylene	µg/L	<1
Acenaphthene	µg/L	<1
Fluorene	µg/L	<1
Phenanthrene	µg/L	<1
Anthracene	µg/L	<1
Fluoranthene	µg/L	<1
Pyrene	µg/L	<1
Benzo(a)anthracene	µg/L	<1
Chrysene	µg/L	<1
Benzo(b,j+k)fluoranthene	µg/L	<2
Benzo(a)pyrene	µg/L	<1
Indeno(1,2,3-c,d)pyrene	µg/L	<1
Dibenzo(a,h)anthracene	µg/L	<1
Benzo(g,h,i)perylene	µg/L	<1
Benzo(a)pyrene TEQ	µg/L	<5
Total +ve PAH's	µg/L	NIL (+)VE
Surrogate p-Terphenyl-d14	%	73

Metals in Waters - Acid extractable		
Our Reference		324186-29
Your Reference	UNITS	FR-AUGER
Depth		-
Date Sampled		22/05/2023
Type of sample		Water
Date prepared	-	30/05/2023
Date analysed	-	30/05/2023
Arsenic - Total	mg/L	<0.05
Cadmium - Total	mg/L	<0.01
Chromium - Total	mg/L	<0.01
Copper - Total	mg/L	0.7
Lead - Total	mg/L	<0.03
Mercury - Total	mg/L	<0.0005
Nickel - Total	mg/L	<0.02
Zinc - Total	mg/L	<0.02

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) **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-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
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	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.

Method ID	Methodology Summary
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. 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-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
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.
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/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
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	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.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	324186-3
Date extracted	-			29/05/2023	1	29/05/2023	29/05/2023		29/05/2023	29/05/2023
Date analysed	-			30/05/2023	1	30/05/2023	30/05/2023		30/05/2023	30/05/2023
TRH C_6 - C_9	mg/kg	25	Org-023	<25	1	<25	<25	0	98	88
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	1	<25	<25	0	98	88
Benzene	mg/kg	0.2	Org-023	<0.2	1	<0.2	<0.2	0	93	94
Toluene	mg/kg	0.5	Org-023	<0.5	1	<0.5	<0.5	0	101	89
Ethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	95	83
m+p-xylene	mg/kg	2	Org-023	<2	1	<2	<2	0	101	87
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	96	90
Naphthalene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	74	1	70	74	6	74	74

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			[NT]	20	29/05/2023	29/05/2023		29/05/2023	[NT]
Date analysed	-			[NT]	20	30/05/2023	30/05/2023		30/05/2023	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	[NT]	20	<25	<25	0	91	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	[NT]	20	<25	<25	0	91	[NT]
Benzene	mg/kg	0.2	Org-023	[NT]	20	<0.2	<0.2	0	99	[NT]
Toluene	mg/kg	0.5	Org-023	[NT]	20	<0.5	<0.5	0	88	[NT]
Ethylbenzene	mg/kg	1	Org-023	[NT]	20	<1	<1	0	86	[NT]
m+p-xylene	mg/kg	2	Org-023	[NT]	20	<2	<2	0	90	[NT]
o-Xylene	mg/kg	1	Org-023	[NT]	20	<1	<1	0	92	[NT]
Naphthalene	mg/kg	1	Org-023	[NT]	20	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	20	81	80	1	79	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	324186-3
Date extracted	-			29/05/2023	1	29/05/2023	29/05/2023		29/05/2023	29/05/2023
Date analysed	-			29/05/2023	1	29/05/2023	29/05/2023		29/05/2023	29/05/2023
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	1	<50	<50	0	90	92
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	1	<100	<100	0	84	92
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	1	<100	<100	0	71	120
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	1	<50	<50	0	90	92
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	1	<100	<100	0	84	92
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	1	<100	<100	0	71	120
Surrogate o-Terphenyl	%		Org-020	105	1	90	90	0	96	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]	20	29/05/2023	29/05/2023		[NT]	[NT]
Date analysed	-			[NT]	20	29/05/2023	29/05/2023		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	20	<50	<50	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	20	<100	<100	0	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	20	<100	<100	0	[NT]	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	[NT]	20	<50	<50	0	[NT]	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	[NT]	20	<100	<100	0	[NT]	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	[NT]	20	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-020	[NT]	20	89	89	0	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	324186-3
Date extracted	-			29/05/2023	1	29/05/2023	29/05/2023		29/05/2023	29/05/2023
Date analysed	-			29/05/2023	1	29/05/2023	29/05/2023		29/05/2023	29/05/2023
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	93	86
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	95	85
Fluorene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	93	84
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	0.2	67	86	83
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	<0.1	0.4	120	94	81
Pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	0.3	100	93	82
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	0.3	100	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	0.2	67	95	85
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	<0.05	0.2	120	88	88
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	101	1	97	98	1	103	92

QUALITY CONTROL: PAHs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	20	29/05/2023	29/05/2023		[NT]	[NT]
Date analysed	-			[NT]	20	29/05/2023	29/05/2023		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-022/025	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-022/025	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-022/025	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	20	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	20	<0.05	<0.05	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	20	97	97	0	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	324186-3
Date extracted	-			29/05/2023	1	29/05/2023	29/05/2023		29/05/2023	29/05/2023
Date analysed	-			29/05/2023	1	29/05/2023	29/05/2023		29/05/2023	29/05/2023
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	100	90
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	100	88
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	103	91
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	99	87
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	94	82
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	109	96
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	110	98
Endrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	100	90
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	96	86
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	101	87
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	113	1	109	112	3	110	100

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	12	29/05/2023	29/05/2023		[NT]	[NT]
Date analysed	-			[NT]	12	02/06/2023	02/06/2023		[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
HCB	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	12	0.2	0.3	40	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	12	108	110	2	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	14	29/05/2023	29/05/2023		[NT]	[NT]
Date analysed	-			[NT]	14	02/06/2023	02/06/2023		[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
HCB	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	14	107	105	2	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	20	29/05/2023	29/05/2023		[NT]	[NT]
Date analysed	-			[NT]	20	29/05/2023	29/05/2023		[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
HCB	mg/kg	0.1	Org-022/025	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-022/025	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	20	109	111	2	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides					Duplicate					Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	324186-3
Date extracted	-			29/05/2023	1	29/05/2023	29/05/2023		29/05/2023	29/05/2023
Date analysed	-			29/05/2023	1	29/05/2023	29/05/2023		29/05/2023	29/05/2023
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	98	86
Chlorpyriphos-methyl	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	111	115
Dimethoate	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	90	86
Fenitrothion	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	128	130
Malathion	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	103	97
Parathion	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	130	130
Ronnel	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	97	83
Coumaphos	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Disulfoton	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fenamiphos	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fenthion	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Methidathion	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Mevinphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Parathion (Methyl)	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Phorate	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Phosalone	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	113	1	109	112	3	110	100

QUALITY CONTROL: Organophosphorus Pesticides					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	20	29/05/2023	29/05/2023		[NT]	[NT]
Date analysed	-			[NT]	20	29/05/2023	29/05/2023		[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-021	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-021	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-021	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-021	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-021	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-021	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-021	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-021	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-021	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-021	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-021	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-021	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Coumaphos	mg/kg	0.1	Org-021	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Disulfoton	mg/kg	0.1	Org-021	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Fenamiphos	mg/kg	0.1	Org-021	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Fenthion	mg/kg	0.1	Org-021	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Methidathion	mg/kg	0.1	Org-021	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Mevinphos	mg/kg	0.1	Org-022/025	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Parathion (Methyl)	mg/kg	0.1	Org-021	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Phorate	mg/kg	0.1	Org-021	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Phosalone	mg/kg	0.1	Org-021	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	[NT]	20	109	111	2	[NT]	[NT]

QUALITY CONTROL: PCBs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	324186-3
Date extracted	-			29/05/2023	1	29/05/2023	29/05/2023		29/05/2023	29/05/2023
Date analysed	-			29/05/2023	1	29/05/2023	29/05/2023		29/05/2023	29/05/2023
Aroclor 1016	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	124	120
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	113	1	109	112	3	110	100

QUALITY CONTROL: PCBs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	20	29/05/2023	29/05/2023		[NT]	[NT]
Date analysed	-			[NT]	20	29/05/2023	29/05/2023		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-021	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	[NT]	20	109	111	2	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	324186-3
Date prepared	-			30/05/2023	1	30/05/2023	30/05/2023		30/05/2023	30/05/2023
Date analysed	-			30/05/2023	1	30/05/2023	30/05/2023		30/05/2023	30/05/2023
Arsenic	mg/kg	4	Metals-020	<4	1	<4	<4	0	94	94
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	98	86
Chromium	mg/kg	1	Metals-020	<1	1	35	37	6	109	#
Copper	mg/kg	1	Metals-020	<1	1	28	28	0	104	119
Lead	mg/kg	1	Metals-020	<1	1	13	13	0	102	83
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	75	89
Nickel	mg/kg	1	Metals-020	<1	1	11	11	0	101	81
Zinc	mg/kg	1	Metals-020	<1	1	38	37	3	100	82

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	20	30/05/2023	30/05/2023		[NT]	[NT]
Date analysed	-			[NT]	20	30/05/2023	30/05/2023		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	20	4	4	0	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	20	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	20	19	20	5	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	20	8	8	0	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	20	9	10	11	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	20	7	6	15	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	20	12	12	0	[NT]	[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	-			29/05/2023	29	29/05/2023	30/05/2023		29/05/2023	[NT]
Date analysed	-			30/05/2023	29	30/05/2023	30/05/2023		30/05/2023	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	29	32	38	17	112	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	29	39	38	3	112	[NT]
Benzene	µg/L	1	Org-023	<1	29	<1	<1	0	110	[NT]
Toluene	µg/L	1	Org-023	<1	29	<1	<1	0	112	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	29	<1	<1	0	114	[NT]
m+p-xylene	µg/L	2	Org-023	<2	29	<2	<2	0	109	[NT]
o-xylene	µg/L	1	Org-023	<1	29	<1	<1	0	110	[NT]
Naphthalene	µg/L	1	Org-023	<1	29	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	110	29	124	122	2	108	[NT]
Surrogate toluene-d8	%		Org-023	104	29	113	111	2	112	[NT]
Surrogate 4-BFB	%		Org-023	102	29	103	103	0	106	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			29/05/2023	[NT]	[NT]	[NT]	[NT]	29/05/2023	[NT]
Date analysed	-			29/05/2023	[NT]	[NT]	[NT]	[NT]	29/05/2023	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	86	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	91	[NT]
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	114	[NT]
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	86	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	91	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	114	[NT]
Surrogate o-Terphenyl	%		Org-020	67	[NT]	[NT]	[NT]	[NT]	88	[NT]

QUALITY CONTROL: PAHs in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			29/05/2023	[NT]	[NT]	[NT]	[NT]	29/05/2023	[NT]
Date analysed	-			29/05/2023	[NT]	[NT]	[NT]	[NT]	29/05/2023	[NT]
Naphthalene	µg/L	2	Org-022/025	<2	[NT]	[NT]	[NT]	[NT]	75	[NT]
Acenaphthylene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	75	[NT]
Fluorene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	75	[NT]
Phenanthrene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	79	[NT]
Anthracene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	81	[NT]
Pyrene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	81	[NT]
Benzo(a)anthracene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	60	[NT]
Benzo(b,j+k)fluoranthene	µg/L	2	Org-022/025	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	78	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	75	[NT]	[NT]	[NT]	[NT]	70	[NT]

QUALITY CONTROL: Metals in Waters - Acid extractable					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			30/05/2023	[NT]	[NT]	[NT]	[NT]	30/05/2023	[NT]
Date analysed	-			30/05/2023	[NT]	[NT]	[NT]	[NT]	30/05/2023	[NT]
Arsenic - Total	mg/L	0.05	Metals-020	<0.05	[NT]	[NT]	[NT]	[NT]	86	[NT]
Cadmium - Total	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	90	[NT]
Chromium - Total	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	86	[NT]
Copper - Total	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	84	[NT]
Lead - Total	mg/L	0.03	Metals-020	<0.03	[NT]	[NT]	[NT]	[NT]	86	[NT]
Mercury - Total	mg/L	0.0005	Metals-021	<0.0005	[NT]	[NT]	[NT]	[NT]	108	[NT]
Nickel - Total	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	85	[NT]
Zinc - Total	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	86	[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

8 metals in soil - # Percent recovery is not possible to report due to the inhomogeneous nature of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.
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.

Note: All samples analysed as received. However, samples 324186-3, 4, 6, 8, 22 are below the minimum recommended 500mL sample volume as per National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013.

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	JK Environments
Attention	Katrina Taylor

Sample Login Details	
Your reference	E35521PT, Blayney
Envirolab Reference	324186
Date Sample Received	26/05/2023
Date Instructions Received	26/05/2023
Date Results Expected to be Reported	02/06/2023

Sample Condition	
Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	30 Soil, 1 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	15
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Only received 40ml vial for TB1 - analysed for TRH/BTEX

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	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides	PCBs in Soil	Acid Extractable metalsin soil	Asbestos ID - soils NEPM - ASB-001	vTRH(C6-C10)/BTEXN in Water	svTRH (C10-C40) in Water	PAHsin Water	Metals in Waters -Acid extractable	On Hold
BH102-0-0.2	✓	✓	✓	✓	✓	✓	✓	✓					
BH102-0.65-0.9													✓
BH103-0-0.2	✓	✓	✓	✓	✓	✓	✓	✓					
BH104-0-0.2	✓	✓	✓	✓	✓	✓	✓	✓					
BH104-0.4-0.6													✓
BH105-0-0.2	✓	✓	✓	✓	✓	✓	✓	✓					
BH105-0.4-0.7													✓
BH106-0-0.2	✓	✓	✓	✓	✓	✓	✓	✓					
BH106-0.8-1													✓
BH108-0-0.2	✓	✓	✓	✓	✓	✓	✓	✓					
BH108-0.8-1													✓
BH109-0-0.2	✓	✓	✓	✓	✓	✓	✓	✓					
BH109-0.8-1													✓
BH110-0-0.2	✓	✓	✓	✓	✓	✓	✓	✓					
BH111-0-0.2	✓	✓	✓	✓	✓	✓	✓	✓					
BH111-0.5-0.7													✓
BH112-0-0.2	✓	✓	✓	✓	✓	✓	✓	✓					
BH112-0.4-0.6													✓
BH112-0.6-0.8													✓
BH114-0-0.2	✓	✓	✓	✓	✓	✓	✓	✓					
BH114-0.8-1													✓
BH118-0-0.2	✓	✓	✓	✓	✓	✓	✓	✓					
BH118-0.6-0.8													✓
BH119-0-0.2	✓	✓	✓	✓	✓	✓	✓	✓					
BH119-0.9-1.1													✓
SDUP1	✓	✓	✓	✓	✓	✓	✓						
SDUP3													✓
SDUP4													✓
FR-AUGER									✓	✓	✓	✓	
TB1	✓												
TS1	✓												

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

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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.

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD 12 ASHLEY STREET CHATSWOOD NSW 2067 P: (02) 99106200 F: (02) 99106201 Attention: Aileen	JKE Job Number: E35521PT Date Results Required: STANDARD Page: 1 of 1	JKEnvironments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: Ktaylor@jkenvironments.com.au

Location: Blayney

Sampler: OB

Sample Preserved in Esky on Ice

Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	#6 - HM/TRH/BTEX	#3 - TRH/BTEXN/PA	Chromium IV	Asbestos (WA 500mL method)	Asbestos (Detection)	pH, CEC and clay content	VOCs (includes BTEX)	TCLP 6 Metals & PAHs	BTEX			
22/05/2023	1	BH102	0-0.2	G, A	0	F: Silty Clay	X			X								
22/05/2023	2	BH102	0.65-0.9	G, A	0	Silty Clay												
22/05/2023	3	BH103	0-0.2	G, A	0	F: Silty Clay	X			X								
22/05/2023	4	BH104	0-0.2	G, A	0	F: Silty Clay	X			X								
22/05/2023	5	BH104	0.4-0.6	G, A	0	F: Silty Clay												
22/05/2023	6	BH105	0-0.2	G, A	0	F: Silty Clay	X			X								
22/05/2023	7	BH105	0.4-0.7	G, A	0	Silty Clay												
23/05/2023	8	BH106	0-0.2	G, A	0	F: Silty Clay	X			X								
23/05/2023	9	BH106	0.8-1	G, A	0.1	Silty Clay												
23/05/2023	10	BH108	0-0.2	G, A	0	F: Silty Clay	X			X								
23/05/2023	11	BH108	0.8-1	G, A	0	Silty Clay												
22/05/2023	12	BH109	0-0.2	G, A	0	F: Silty Clay	X			X								
22/05/2023	13	BH109	0.8-1	G, A	0	Silty Clay												
22/05/2023	14	BH110	0-0.2	G, A	0	F: Silty Clay	X			X								
22/05/2023	15	BH111	0-0.2	G, A	0	F: Silty Clay	X			X								
22/05/2023	16	BH111	0.5-0.7	G, A	0	Silty Clay												
23/05/2023	17	BH112	0-0.2	G, A	2.5	F: Silty Clay	X			X								
23/05/2023	18	BH112	0.4-0.6	G, A	0.1	Silty Sandy Clay												
23/05/2023	19	BH112	0.6-0.8	G, A	1.3	Silty Sandy Clay												
23/05/2023	20	BH114	0-0.2	G, A	0	F: Silty Clay	X			X								
23/05/2023	21	BH114	0.8-1	G, A	0	Silty Clay												
23/05/2023	22	BH118	0-0.2	G, A	1.1	F: Silty Clay	X			X								
23/05/2023	23	BH118	0.6-0.8	G, A	0.3	Silty Clay												
23/05/2023	24	BH119	0-0.2	G, A	2.6	F: Silty Clay	X			X								
23/05/2023	25	BH119	0.9-1.1	G, A	0.9	Silty Clay												
22/05/2023	26	SDUP1	-	G	-	Fill	X											
22/05/2023	—	SDUP2	-	G	-	Fill	X		Please send to Melbourne Envirolab									
22/05/2023	27	SDUP3	-	G	-	Fill												
22/05/2023	28	SDUP4	-	G	-	Fill												
22/05/2023	29	FR-AUGER	-	V	-	Water		X										
22/05/2023	30	TB1	-	G	-	Sand		X										
22/05/2023	31	TS1	-	V	-	Sand									X			

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200
Job No: 324486
Date Received: 26/05/23
Time Received: 1540
Received By: SP
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security:

Remarks (comments/detection limits required):

Sample Containers:
G - 250mg Glass Jar
A - Ziplock Asbestos Bag
P - Plastic Bag

Relinquished By: KT	Date: 26.05.23	Time: 1540	Received By: ELS Syd	Date: 26/05/23

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CERTIFICATE OF ANALYSIS 324186-A

Client Details

Client	JK Environments
Attention	Katrina Taylor
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E35521PT, Blayney**
Number of Samples	additional analysis
Date samples received	26/05/2023
Date completed instructions received	05/06/2023

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	13/06/2023
Date of Issue	13/06/2023

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

Results Approved By
Hannah Nguyen, Metals Supervisor
Kyle Gavrily, Senior Chemist
Liam Timmins, Organics Supervisor
Loren Bardwell, Development Chemist

Authorised By
Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		324186-A-2	324186-A-7	324186-A-13	324186-A-18	324186-A-23
Your Reference	UNITS	BH102	BH105	BH109	BH112	BH118
Depth		0.65-0.9	0.4-0.7	0.8-1	0.4-0.6	0.6-0.8
Date Sampled		22/05/2023	22/05/2023	22/05/2023	23/05/2023	23/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	06/06/2023	06/06/2023	06/06/2023	06/06/2023	06/06/2023
Date analysed	-	06/06/2023	06/06/2023	06/06/2023	06/06/2023	06/06/2023
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH 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	%	94	89	92	109	115

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		324186-A-25
Your Reference	UNITS	BH119
Depth		0.9-1.1
Date Sampled		23/05/2023
Type of sample		Soil
Date extracted	-	06/06/2023
Date analysed	-	06/06/2023
TRH C_6 - C_9	mg/kg	<25
TRH C_6 - C_{10}	mg/kg	<25
vTPH 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	%	89

svTRH (C10-C40) in Soil						
Our Reference		324186-A-2	324186-A-7	324186-A-13	324186-A-18	324186-A-23
Your Reference	UNITS	BH102	BH105	BH109	BH112	BH118
Depth		0.65-0.9	0.4-0.7	0.8-1	0.4-0.6	0.6-0.8
Date Sampled		22/05/2023	22/05/2023	22/05/2023	23/05/2023	23/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	06/06/2023	06/06/2023	06/06/2023	06/06/2023	06/06/2023
Date analysed	-	07/06/2023	07/06/2023	07/06/2023	07/06/2023	07/06/2023
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<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	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	88	89	86	89	89

svTRH (C10-C40) in Soil		
Our Reference		324186-A-25
Your Reference	UNITS	BH119
Depth		0.9-1.1
Date Sampled		23/05/2023
Type of sample		Soil
Date extracted	-	06/06/2023
Date analysed	-	07/06/2023
TRH C_{10} - C_{14}	mg/kg	<50
TRH C_{15} - C_{28}	mg/kg	<100
TRH C_{29} - C_{36}	mg/kg	<100
Total +ve TRH (C10-C36)	mg/kg	<50
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	<100
TRH >C_{34} -C_{40}	mg/kg	<100
Total +ve TRH (>C10-C40)	mg/kg	<50
Surrogate o-Terphenyl	%	88

PAHs in Soil						
Our Reference		324186-A-2	324186-A-7	324186-A-13	324186-A-18	324186-A-23
Your Reference	UNITS	BH102	BH105	BH109	BH112	BH118
Depth		0.65-0.9	0.4-0.7	0.8-1	0.4-0.6	0.6-0.8
Date Sampled		22/05/2023	22/05/2023	22/05/2023	23/05/2023	23/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	06/06/2023	06/06/2023	06/06/2023	06/06/2023	06/06/2023
Date analysed	-	06/06/2023	06/06/2023	06/06/2023	06/06/2023	06/06/2023
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	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<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	<0.05	<0.05	<0.05	<0.05	<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	<0.05	<0.05	<0.05	<0.05	<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	%	111	109	105	111	106

PAHs in Soil		
Our Reference		324186-A-25
Your Reference	UNITS	BH119
Depth		0.9-1.1
Date Sampled		23/05/2023
Type of sample		Soil
Date extracted	-	06/06/2023
Date analysed	-	06/06/2023
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	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
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	<0.1
Total +ve PAH's	mg/kg	<0.05
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	%	106

Organochlorine Pesticides in soil		
Our Reference		324186-A-13
Your Reference	UNITS	BH109
Depth		0.8-1
Date Sampled		22/05/2023
Type of sample		Soil
Date extracted	-	06/06/2023
Date analysed	-	06/06/2023
alpha-BHC	mg/kg	<0.1
HCB	mg/kg	<0.1
beta-BHC	mg/kg	<0.1
gamma-BHC	mg/kg	<0.1
Heptachlor	mg/kg	<0.1
delta-BHC	mg/kg	<0.1
Aldrin	mg/kg	<0.1
Heptachlor Epoxide	mg/kg	<0.1
gamma-Chlordane	mg/kg	<0.1
alpha-chlordane	mg/kg	<0.1
Endosulfan I	mg/kg	<0.1
pp-DDE	mg/kg	<0.1
Dieldrin	mg/kg	<0.1
Endrin	mg/kg	<0.1
Endosulfan II	mg/kg	<0.1
pp-DDD	mg/kg	<0.1
Endrin Aldehyde	mg/kg	<0.1
pp-DDT	mg/kg	<0.1
Endosulfan Sulphate	mg/kg	<0.1
Methoxychlor	mg/kg	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1
Surrogate TCMX	%	124

Organophosphorus Pesticides		
Our Reference		324186-A-13
Your Reference	UNITS	BH109
Depth		0.8-1
Date Sampled		22/05/2023
Type of sample		Soil
Date extracted	-	06/06/2023
Date analysed	-	06/06/2023
Azinphos-methyl (Guthion)	mg/kg	<0.1
Bromophos-ethyl	mg/kg	<0.1
Chlorpyriphos	mg/kg	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1
Diazinon	mg/kg	<0.1
Dichlorvos	mg/kg	<0.1
Dimethoate	mg/kg	<0.1
Ethion	mg/kg	<0.1
Fenitrothion	mg/kg	<0.1
Malathion	mg/kg	<0.1
Parathion	mg/kg	<0.1
Ronnel	mg/kg	<0.1
Coumaphos	mg/kg	<0.1
Disulfoton	mg/kg	<0.1
Fenamiphos	mg/kg	<0.1
Fenthion	mg/kg	<0.1
Methidathion	mg/kg	<0.1
Mevinphos	mg/kg	<0.1
Parathion (Methyl)	mg/kg	<0.1
Phorate	mg/kg	<0.1
Phosalone	mg/kg	<0.1
Surrogate TCMX	%	124

PCBs in Soil		
Our Reference		324186-A-13
Your Reference	UNITS	BH109
Depth		0.8-1
Date Sampled		22/05/2023
Type of sample		Soil
Date extracted	-	06/06/2023
Date analysed	-	06/06/2023
Aroclor 1016	mg/kg	<0.1
Aroclor 1221	mg/kg	<0.1
Aroclor 1232	mg/kg	<0.1
Aroclor 1242	mg/kg	<0.1
Aroclor 1248	mg/kg	<0.1
Aroclor 1254	mg/kg	<0.1
Aroclor 1260	mg/kg	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1
Surrogate TCMX	%	124

Acid Extractable metals in soil						
Our Reference		324186-A-2	324186-A-7	324186-A-13	324186-A-18	324186-A-23
Your Reference	UNITS	BH102	BH105	BH109	BH112	BH118
Depth		0.65-0.9	0.4-0.7	0.8-1	0.4-0.6	0.6-0.8
Date Sampled		22/05/2023	22/05/2023	22/05/2023	23/05/2023	23/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	06/06/2023	06/06/2023	06/06/2023	06/06/2023	06/06/2023
Date analysed	-	07/06/2023	07/06/2023	07/06/2023	07/06/2023	07/06/2023
Arsenic	mg/kg	<4	<4	50	72	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	21	11	13	53	21
Copper	mg/kg	28	10	16	27	12
Lead	mg/kg	13	10	20	56	11
Mercury	mg/kg	<0.1	<0.1	<0.1	0.5	<0.1
Nickel	mg/kg	5	3	6	50	6
Zinc	mg/kg	22	22	49	83	17

Acid Extractable metals in soil		
Our Reference		324186-A-25
Your Reference	UNITS	BH119
Depth		0.9-1.1
Date Sampled		23/05/2023
Type of sample		Soil
Date prepared	-	06/06/2023
Date analysed	-	07/06/2023
Arsenic	mg/kg	<4
Cadmium	mg/kg	<0.4
Chromium	mg/kg	38
Copper	mg/kg	11
Lead	mg/kg	14
Mercury	mg/kg	<0.1
Nickel	mg/kg	5
Zinc	mg/kg	10

Moisture						
Our Reference		324186-A-2	324186-A-7	324186-A-13	324186-A-18	324186-A-23
Your Reference	UNITS	BH102	BH105	BH109	BH112	BH118
Depth		0.65-0.9	0.4-0.7	0.8-1	0.4-0.6	0.6-0.8
Date Sampled		22/05/2023	22/05/2023	22/05/2023	23/05/2023	23/05/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	06/06/2023	06/06/2023	06/06/2023	06/06/2023	06/06/2023
Date analysed	-	07/06/2023	07/06/2023	07/06/2023	07/06/2023	07/06/2023
Moisture	%	16	16	18	13	13

Moisture		
Our Reference		324186-A-25
Your Reference	UNITS	BH119
Depth		0.9-1.1
Date Sampled		23/05/2023
Type of sample		Soil
Date prepared	-	06/06/2023
Date analysed	-	07/06/2023
Moisture	%	8.4

CEC		
Our Reference		324186-A-17
Your Reference	UNITS	BH112
Depth		0-0.2
Date Sampled		23/05/2023
Type of sample		Soil
Date prepared	-	13/06/2023
Date analysed	-	13/06/2023
Exchangeable Ca	meq/100g	5.8
Exchangeable K	meq/100g	0.8
Exchangeable Mg	meq/100g	2.0
Exchangeable Na	meq/100g	<0.1
Cation Exchange Capacity	meq/100g	8.5

Metals from Leaching Fluid pH 2.9 or 5		
Our Reference		324186-A-17
Your Reference	UNITS	BH112
Depth		0-0.2
Date Sampled		23/05/2023
Type of sample		Soil
Date extracted	-	06/06/2023
Date analysed	-	06/06/2023
pH of soil for fluid# determ.	pH units	7.3
pH of soil TCLP (after HCl)	pH units	1.7
Extraction fluid used		1
pH of final Leachate	pH units	4.9
Nickel	mg/L	0.02

Method ID	Methodology Summary
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using AS 4439 and USEPA 1311. 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.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.
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.
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.
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	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. 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-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.

Method ID	Methodology Summary
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.
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.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			06/06/2023	[NT]	[NT]	[NT]	[NT]	06/06/2023	[NT]
Date analysed	-			06/06/2023	[NT]	[NT]	[NT]	[NT]	06/06/2023	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	104	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	104	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	[NT]	[NT]	[NT]	[NT]	102	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	[NT]	[NT]	[NT]	[NT]	104	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	110	[NT]
o-Xylene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Naphthalene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	105	[NT]	[NT]	[NT]	[NT]	102	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			06/06/2023	[NT]	[NT]	[NT]	[NT]	06/06/2023	[NT]
Date analysed	-			07/06/2023	[NT]	[NT]	[NT]	[NT]	07/06/2023	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	119	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	113	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	129	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	119	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	113	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	129	[NT]
Surrogate o-Terphenyl	%		Org-020	90	[NT]	[NT]	[NT]	[NT]	93	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			06/06/2023	[NT]	[NT]	[NT]	[NT]	06/06/2023	[NT]
Date analysed	-			06/06/2023	[NT]	[NT]	[NT]	[NT]	06/06/2023	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Fluorene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	[NT]	[NT]	[NT]	[NT]	82	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	109	[NT]	[NT]	[NT]	[NT]	105	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			06/06/2023	[NT]	[NT]	[NT]	[NT]	06/06/2023	[NT]
Date analysed	-			06/06/2023	[NT]	[NT]	[NT]	[NT]	06/06/2023	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
HCB	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	105	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	107	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	112	[NT]
Endrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	90	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	89	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	129	[NT]	[NT]	[NT]	[NT]	122	[NT]

QUALITY CONTROL: Organophosphorus Pesticides					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			06/06/2023	[NT]	[NT]	[NT]	[NT]	06/06/2023	[NT]
Date analysed	-			06/06/2023	[NT]	[NT]	[NT]	[NT]	06/06/2023	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	119	[NT]
Dimethoate	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	86	[NT]
Fenitrothion	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	91	[NT]
Malathion	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Parathion	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	111	[NT]
Ronnel	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Coumaphos	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Disulfoton	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fenamiphos	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fenthion	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Methidathion	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Mevinphos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Parathion (Methyl)	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Phorate	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Phosalone	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-021	129	[NT]	[NT]	[NT]	[NT]	122	[NT]

QUALITY CONTROL: PCBs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			06/06/2023	[NT]	[NT]	[NT]	[NT]	06/06/2023	[NT]
Date analysed	-			06/06/2023	[NT]	[NT]	[NT]	[NT]	06/06/2023	[NT]
Aroclor 1016	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	130	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-021	129	[NT]	[NT]	[NT]	[NT]	122	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date prepared	-			06/06/2023	[NT]	[NT]	[NT]	[NT]	06/06/2023	[NT]
Date analysed	-			07/06/2023	[NT]	[NT]	[NT]	[NT]	07/06/2023	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	107	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	100	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]

QUALITY CONTROL: CEC					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date prepared	-			13/06/2023	[NT]	[NT]	[NT]	[NT]	13/06/2023	[NT]
Date analysed	-			13/06/2023	[NT]	[NT]	[NT]	[NT]	13/06/2023	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	103	[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]	99	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	102	[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-W2	[NT]
Date extracted	-			06/06/2023	[NT]	[NT]	[NT]	[NT]	06/06/2023	[NT]
Date analysed	-			06/06/2023	[NT]	[NT]	[NT]	[NT]	06/06/2023	[NT]
Nickel	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	92	[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.

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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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SAMPLE RECEIPT ADVICE

Client Details

Client	JK Environments
Attention	Katrina Taylor

Sample Login Details

Your reference	E35521PT, Blayney
Envirolab Reference	324186-A
Date Sample Received	26/05/2023
Date Instructions Received	05/06/2023
Date Results Expected to be Reported	13/06/2023

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	additional analysis
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	15
Cooling Method	Ice Pack
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	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides	PCBs in Soil	Acid Extractable metalsin soil	CEC	pH of soil for fluid#determ.	pH of soil TCLP (after HCl)	Extraction fluid used	pH of final Leachate	Nickel	On Hold
BH102-0-0.2														✓
BH102-0.65-0.9	✓	✓	✓				✓							
BH103-0-0.2														✓
BH104-0-0.2														✓
BH104-0.4-0.6														✓
BH105-0-0.2														✓
BH105-0.4-0.7	✓	✓	✓				✓							
BH106-0-0.2														✓
BH106-0.8-1														✓
BH108-0-0.2														✓
BH108-0.8-1														✓
BH109-0-0.2														✓
BH109-0.8-1	✓	✓	✓	✓	✓	✓	✓							
BH110-0-0.2														✓
BH111-0-0.2														✓
BH111-0.5-0.7														✓
BH112-0-0.2								✓	✓	✓	✓	✓	✓	
BH112-0.4-0.6	✓	✓	✓				✓							
BH112-0.6-0.8														✓
BH114-0-0.2														✓
BH114-0.8-1														✓
BH118-0-0.2														✓
BH118-0.6-0.8	✓	✓	✓				✓							
BH119-0-0.2														✓
BH119-0.9-1.1	✓	✓	✓				✓							
SDUP1														✓
SDUP3														✓
SDUP4														✓
FR-AUGER														✓
TB1														✓
TS1														✓

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

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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.

Ming To

From: Katrina Taylor <KTaylor@jkenvironments.com.au>
Sent: Monday, 5 June 2023 10:47 AM
To: Samplereceipt
Subject: FW: Results for Registration 324186 E35521PT, Blayney
Attachments: 324186-[R00].pdf; 324186-COC.pdf; JK Environment Soil for Envirolab 324186.xlsx; 324186.Excel.xlsx

CAUTION: This email originated from outside of the organisation. Do not act on instructions, click links or open attachments unless you recognise the sender and know the content is authentic and safe.

Ref: 324186-A
TAT: Standard.
Due: 13/06/2023
MT.

Morning,

Please schedule the following on standard TA:

#6
BH109 (0.8-1.0 13

#3
BH102 (0.65-0.9) 2
BH105 (0.4-0.7) 7
BH112 (0.4-0.6) 18
BH118 (0.6-0.8) 23
BH119 (0.9-1.1) 25

CEC
BH112 (0-0.2) 17

TCLP Nickel
BH112 (0-0.2) 17

Thanks.

Regards
Katrina Taylor
Associate | Environmental Scientist
NSW Licensed Asbestos Assessor

T: +612 9888 5000
D: 0418 481 628
E: KTaylor@jkenvironments.com.au
www.jkenvironments.com.au

PO Box 976
NORTH RYDE BC NSW 1670
115 Wicks Road
MACQUARIE PARK NSW 2113

JKEnvironments

From: Lucy Zhu <LZhu@envirolab.com.au>
Sent: Friday, 2 June 2023 2:53 PM
To: Katrina Taylor <KTaylor@jkenvironments.com.au>
Subject: Results for Registration 324186 E35521PT, Blayney

This message originated outside the JKG network. If this looks to be from a staff member, it is likely to be malicious (spam/phish attack). Do not click links of open attachments unless you recognise the sender and know the content is safe.

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CERTIFICATE OF ANALYSIS 324186-B

Client Details

Client	JK Environments
Attention	Katrina Taylor
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E35521PT, Blayney**
Number of Samples	additional analysis
Date samples received	26/05/2023
Date completed instructions received	14/06/2023

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	19/06/2023
Date of Issue	19/06/2023

NATA Accreditation Number 2901. This document shall not be reproduced except in full.

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

Results Approved By
Giovanni Agosti, Group Technical Manager
Hannah Nguyen, Metals Supervisor

Authorised By
Nancy Zhang, Laboratory Manager

Metals from Leaching Fluid pH 2.9 or 5		
Our Reference		324186-B-18
Your Reference	UNITS	BH112
Depth		0.4-0.6
Date Sampled		23/05/2023
Type of sample		Soil
Date extracted	-	15/06/2023
Date analysed	-	15/06/2023
pH of soil for fluid# determ.	pH units	5.6
pH of soil TCLP (after HCl)	pH units	1.9
Extraction fluid used		1
pH of final Leachate	pH units	4.9
Nickel	mg/L	0.04

CEC		
Our Reference		324186-B-18
Your Reference	UNITS	BH112
Depth		0.4-0.6
Date Sampled		23/05/2023
Type of sample		Soil
Date prepared	-	19/06/2023
Date analysed	-	19/06/2023
Exchangeable Ca	meq/100g	8.8
Exchangeable K	meq/100g	0.3
Exchangeable Mg	meq/100g	1.9
Exchangeable Na	meq/100g	0.2
Cation Exchange Capacity	meq/100g	11

Method ID	Methodology Summary
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using AS 4439 and USEPA 1311. 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.
Metals-020	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-OES analytical finish.

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	-			15/06/2023	[NT]	[NT]	[NT]	[NT]	15/06/2023	[NT]
Date analysed	-			15/06/2023	[NT]	[NT]	[NT]	[NT]	15/06/2023	[NT]
Nickel	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	90	[NT]

QUALITY CONTROL: CEC					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			19/06/2023	[NT]	[NT]	[NT]	[NT]	19/06/2023	[NT]
Date analysed	-			19/06/2023	[NT]	[NT]	[NT]	[NT]	19/06/2023	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	93	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	90	[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
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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

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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.

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SAMPLE RECEIPT ADVICE

Client Details	
Client	JK Environments
Attention	Katrina Taylor

Sample Login Details	
Your reference	E35521PT, Blayney
Envirolab Reference	324186-B
Date Sample Received	26/05/2023
Date Instructions Received	14/06/2023
Date Results Expected to be Reported	19/06/2023

Sample Condition	
Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	additional analysis
Turnaround Time Requested	3 days
Temperature on Receipt (°C)	15
Cooling Method	Ice Pack
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	pH of soil for fluid#determ.	pH of soil TCLP (after HCl)	Extraction fluid used	pH of final Leachate	Nickel	CEC	On Hold
BH102-0-0.2							✓
BH102-0.65-0.9							✓
BH103-0-0.2							✓
BH104-0-0.2							✓
BH104-0.4-0.6							✓
BH105-0-0.2							✓
BH105-0.4-0.7							✓
BH106-0-0.2							✓
BH106-0.8-1							✓
BH108-0-0.2							✓
BH108-0.8-1							✓
BH109-0-0.2							✓
BH109-0.8-1							✓
BH110-0-0.2							✓
BH111-0-0.2							✓
BH111-0.5-0.7							✓
BH112-0-0.2							✓
BH112-0.4-0.6	✓	✓	✓	✓	✓	✓	
BH112-0.6-0.8							✓
BH114-0-0.2							✓
BH114-0.8-1							✓
BH118-0-0.2							✓
BH118-0.6-0.8							✓
BH119-0-0.2							✓
BH119-0.9-1.1							✓
SDUP1							✓
SDUP3							✓
SDUP4							✓
FR-AUGER							✓
TB1							✓
TS1							✓

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

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

Ming To

From: Katrina Taylor <KTaylor@jkenvironments.com.au>
Sent: Wednesday, 14 June 2023 8:28 AM
To: Samplereceipt
Subject: FW: Results for Registration 324186-A E35521PT, Blayney
Attachments: 324186-A-[R00].pdf; 324186-A-COC.pdf; JK Environment Soil for Envirolab 324186-A.xlsx; 324186-A.Excel.xlsx

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Morning,

Ref: 324186-B.
TAT: 3 day.
Due: 19/06/2023
MT

Please schedule the following on 3 day TA:

TCLP Ni & CEC
BH112 (0.4-0.6) (18).

Thank you.

Regards
Katrina Taylor
Associate | Environmental Scientist
NSW Licensed Asbestos Assessor

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D: 0418 481 628
E: KTaylor@jkenvironments.com.au
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NORTH RYDE BC NSW 1670
115 Wicks Road
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JKEnvironments

From: Nancy Zhang <NZhang@envirolab.com.au>
Sent: Tuesday, 13 June 2023 5:51 PM
To: Katrina Taylor <KTaylor@jkenvironments.com.au>
Subject: Results for Registration 324186-A E35521PT, Blayney

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Please refer to attached for:
a copy of the Certificate of Analysis
a copy of the COC/paperwork received from you
an Excel or .csv file containing the results

Please note that a hard copy will not be posted.

Enquiries should be made directly to:
customerservice@envirolab.com.au

How did we do? Send Feedback

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melbourne@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 37508

Client Details

Client	JK Environments
Attention	Katrina Taylor
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E35521PT**
Number of Samples	2 Soil
Date samples received	24/05/2023
Date completed instructions received	24/05/2023

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	30/05/2023
Date of Issue	30/05/2023
Reissue Details	This report supersedes 37508_R00 due to addition of extra OPP analytes as per client request.

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Results Approved By
Tara White, Metals Team Leader
Tianna Milburn, Chemist (FAS)

Authorised By
Pamela Adams, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil			
Our Reference		37508-1	37508-2
Your Reference	UNITS	SDUP102	SDUP104
Date Sampled		17/05/2023	18/05/2023
Type of sample		Soil	Soil
Date extracted	-	25/05/2023	25/05/2023
Date analysed	-	25/05/2023	25/05/2023
vTRH C_6 - C_9	mg/kg	<25	<25
vTRH C_6 - C_{10}	mg/kg	<25	<25
TRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25
Benzene	mg/kg	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1
m+p-xylene	mg/kg	<2	<2
o-Xylene	mg/kg	<1	<1
Naphthalene	mg/kg	<1	<1
Total BTEX	mg/kg	<1	<1
Total +ve Xylenes	mg/kg	<1	<1
Surrogate aaa-Trifluorotoluene	%	76	80

TRH Soil C10-C40 NEPM			
Our Reference		37508-1	37508-2
Your Reference	UNITS	SDUP102	SDUP104
Date Sampled		17/05/2023	18/05/2023
Type of sample		Soil	Soil
Date extracted	-	25/05/2023	25/05/2023
Date analysed	-	25/05/2023	25/05/2023
TRH C_{10} - C_{14}	mg/kg	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50
Surrogate o-Terphenyl	%	85	88

PAHs in Soil			
Our Reference		37508-1	37508-2
Your Reference	UNITS	SDUP102	SDUP104
Date Sampled		17/05/2023	18/05/2023
Type of sample		Soil	Soil
Date extracted	-	25/05/2023	25/05/2023
Date analysed	-	25/05/2023	25/05/2023
Naphthalene	mg/kg	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1
Benzo(b,j&k)fluoranthene	mg/kg	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05
Benzo(a)pyrene TEQ calc (Zero)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc (Half)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc (PQL)	mg/kg	<0.5	<0.5
Surrogate p-Terphenyl-d_{14}	%	68	76

OCP in Soil			
Our Reference		37508-1	37508-2
Your Reference	UNITS	SDUP102	SDUP104
Date Sampled		17/05/2023	18/05/2023
Type of sample		Soil	Soil
Date extracted	-	25/05/2023	25/05/2023
Date analysed	-	25/05/2023	25/05/2023
alpha-BHC	mg/kg	<0.1	<0.1
Hexachlorobenzene	mg/kg	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1
Total +ve reported Aldrin + Dieldrin	mg/kg	<0.1	<0.1
Total +ve reported DDT+DDD+DDE	mg/kg	<0.1	<0.1
Surrogate 2-chlorophenol-d4	%	80	82

OP in Soil			
Our Reference		37508-1	37508-2
Your Reference	UNITS	SDUP102	SDUP104
Date Sampled		17/05/2023	18/05/2023
Type of sample		Soil	Soil
Date extracted	-	25/05/2023	25/05/2023
Date analysed	-	25/05/2023	25/05/2023
Azinphos-methyl	mg/kg	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1
Dichlorovos	mg/kg	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1
Coumaphos	mg/kg	<0.1	<0.1
Disulfoton	mg/kg	<0.1	<0.1
Fenamiphos	mg/kg	<0.1	<0.1
Fenthion	mg/kg	<0.1	<0.1
Methidathion	mg/kg	<0.1	<0.1
Mevinphos	mg/kg	<0.1	<0.1
Methyl Parathion	mg/kg	<0.1	<0.1
Phorate	mg/kg	<0.1	<0.1
Phosalone	mg/kg	<0.1	<0.1
Surrogate 2-chlorophenol-d4	%	80	82

PCBs in Soil			
Our Reference		37508-1	37508-2
Your Reference	UNITS	SDUP102	SDUP104
Date Sampled		17/05/2023	18/05/2023
Type of sample		Soil	Soil
Date extracted	-	25/05/2023	25/05/2023
Date analysed	-	25/05/2023	25/05/2023
Aroclor 1016	mg/kg	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1
Surrogate 2-fluorobiphenyl	%	78	80

Acid Extractable metals in soil			
Our Reference		37508-1	37508-2
Your Reference	UNITS	SDUP102	SDUP104
Date Sampled		17/05/2023	18/05/2023
Type of sample		Soil	Soil
Date digested	-	25/05/2023	25/05/2023
Date analysed	-	26/05/2023	26/05/2023
Arsenic	mg/kg	17	<4
Cadmium	mg/kg	<0.4	<0.4
Chromium	mg/kg	51	7
Copper	mg/kg	66	62
Lead	mg/kg	19	2
Mercury	mg/kg	<0.1	<0.1
Nickel	mg/kg	15	1
Zinc	mg/kg	34	6

Moisture			
Our Reference		37508-1	37508-2
Your Reference	UNITS	SDUP102	SDUP104
Date Sampled		17/05/2023	18/05/2023
Type of sample		Soil	Soil
Date prepared	-	25/05/2023	25/05/2023
Date analysed	-	26/05/2023	26/05/2023
Moisture	%	16	5.1

Method ID	Methodology Summary
Inorg-008	Moisture content determined by heating at 105°C for a minimum of 12 hours.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
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	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD or GC-MS. 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	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
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, For OCs 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.

Method ID	Methodology Summary
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. 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. 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.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	37508-2
Date extracted	-			25/05/2023	2	25/05/2023	25/05/2023		25/05/2023	25/05/2023
Date analysed	-			25/05/2023	2	25/05/2023	25/05/2023		25/05/2023	25/05/2023
vTRH C_6 - C_9	mg/kg	25	Org-023	<25	2	<25	<25	0	105	97
vTRH C_6 - C_{10}	mg/kg	25	Org-023	<25	2	<25	<25	0	105	97
Benzene	mg/kg	0.2	Org-023	<0.2	2	<0.2	<0.2	0	100	93
Toluene	mg/kg	0.5	Org-023	<0.5	2	<0.5	<0.5	0	101	95
Ethylbenzene	mg/kg	1	Org-023	<1	2	<1	<1	0	106	97
m+p-xylene	mg/kg	2	Org-023	<2	2	<2	<2	0	108	100
o-Xylene	mg/kg	1	Org-023	<1	2	<1	<1	0	103	96
Naphthalene	mg/kg	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	85	2	80	84	5	84	80

QUALITY CONTROL: TRH Soil C10-C40 NEPM					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	37508-2
Date extracted	-			25/05/2023	2	25/05/2023	25/05/2023		25/05/2023	25/05/2023
Date analysed	-			25/05/2023	2	25/05/2023	25/05/2023		25/05/2023	25/05/2023
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	2	<50	<50	0	84	94
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	2	<100	<100	0	95	110
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	2	<100	<100	0	93	63
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	2	<50	<50	0	84	94
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	2	<100	<100	0	95	110
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	2	<100	<100	0	93	63
Surrogate o-Terphenyl	%		Org-020	87	2	88	88	0	83	89

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	37508-2
Date extracted	-			25/05/2023	2	25/05/2023	25/05/2023		25/05/2023	25/05/2023
Date analysed	-			25/05/2023	2	25/05/2023	25/05/2023		25/05/2023	25/05/2023
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	82	79
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	80	79
Fluorene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	78	77
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	74	75
Anthracene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	78	77
Pyrene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	76	77
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	74	73
Benzo(b,j&k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	2	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	2	<0.05	<0.05	0	82	77
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d_{14}	%		Org-022/025	68	2	76	72	5	70	70

QUALITY CONTROL: OCP in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			25/05/2023	[NT]	[NT]	[NT]	[NT]	25/05/2023	[NT]
Date analysed	-			25/05/2023	[NT]	[NT]	[NT]	[NT]	25/05/2023	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	70	[NT]
Hexachlorobenzene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	66	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	74	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	80	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	72	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	68	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	70	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	66	[NT]
Endrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	66	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 2-chlorophenol-d4	%		Org-022/025	80	[NT]	[NT]	[NT]	[NT]	80	[NT]

QUALITY CONTROL: OP in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			25/05/2023	[NT]	[NT]	[NT]	[NT]	25/05/2023	[NT]
Date analysed	-			25/05/2023	[NT]	[NT]	[NT]	[NT]	25/05/2023	[NT]
Azinphos-methyl	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyrifos	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	66	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	70	[NT]
Diazinon	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	82	[NT]
Dichlorovos	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	80	[NT]
Fenitrothion	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	62	[NT]
Malathion	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Coumaphos	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Disulfoton	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fenamiphos	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fenthion	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Methidathion	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Mevinphos	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Methyl Parathion	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Phorate	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Phosalone	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 2-chlorophenol-d4	%		Org-022/025	80	[NT]	[NT]	[NT]	[NT]	80	[NT]

QUALITY CONTROL: PCBs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			25/05/2023	[NT]	[NT]	[NT]	[NT]	25/05/2023	[NT]
Date analysed	-			25/05/2023	[NT]	[NT]	[NT]	[NT]	25/05/2023	[NT]
Aroclor 1016	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	77	[NT]
Aroclor 1260	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 2-fluorobiphenyl	%		Org-022/025	78	[NT]	[NT]	[NT]	[NT]	78	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date digested	-			25/05/2023	[NT]	[NT]	[NT]	[NT]	25/05/2023	[NT]
Date analysed	-			26/05/2023	[NT]	[NT]	[NT]	[NT]	26/05/2023	[NT]
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	[NT]	[NT]	[NT]	[NT]	104	[NT]
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	[NT]	[NT]	[NT]	[NT]	101	[NT]
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Copper	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Lead	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	101	[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.

Envirolab Services Pty Ltd
ABN 37 112 535 645 - 002
25 Research Drive Croydon South VIC 3136
ph 03 9763 2500 fax 03 9763 2633
melbourne@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details	
Client	JK Environments
Attention	Katrina Taylor

Sample Login Details	
Your reference	E35521PT
Envirolab Reference	37508
Date Sample Received	24/05/2023
Date Instructions Received	24/05/2023
Date Results Expected to be Reported	30/05/2023

Sample Condition	
Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	2 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	5.4C
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments
Nil

Please direct any queries to:

Pamela Adams	Chris De Luca
Phone: 03 9763 2500	**Phone: 03 9763 2500**
Fax: 03 9763 2633	**Fax: 03 9763 2633**
Email: padams@envirolab.com.au	**Email: cdeluca@envirolab.com.au**

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
ABN 37 112 535 645 - 002
25 Research Drive Croydon South VIC 3136
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Sample ID	vTRH(C6-C10)/BTEXN in Soil	TRH Soil C10-C40 NEPM	PAHs in Soil	OCP in Soil	OP in Soil	PCBsin Soil	Acid Extractable metalsin soil
SDUP102	✓	✓	✓	✓	✓	✓	✓
SDUP104	✓	✓	✓	✓	✓	✓	✓

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.

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD 12 ASHLEY STREET CHATSWOOD NSW 2067 P: (02) 99106200 F: (02) 99106201 Attention: Aileen	JKE Job Number: E35521PT Date Results Required: STANDARD Page: 2 of 2	JKEnvironments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: Katrina Taylor ktaylor@jkenvironments.com.au

Location: Blayney — Sample Preserved in Esky on Ice

Sampler: HW — Tests Required

	Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	#6 - HM/TRH/BTEX	#3 - TRH/BTEXN/PA	Chromium IV	Asbestos (WA 500mL method)	Asbestos (Detection)	pH, CEC and clay content	VOCs (includes BTEX)	TCLP 6 Metals & PAHs	BTEX			
	17/05/2023	26	BH117	0.5-0.7	G, A	0	F: Gravelly Clay												
	17/05/2023	27	BH117	0.7-0.95	G, A	0	F: Gravelly Clay	X			X								
	17/05/2023	28	BH117	1.6-1.95	G, A	0	Silty Clay		X										
	17/05/2023	29	BH117	3.0-3.4	G	0	Silty Clay												
	17/05/2023	30	BH117	4.5-4.8	G	0	Silty Clay												
	17/05/2023	31	BH117	6.0-6.45	G	0	Silty Clay												
	17/05/2023	32	BH117	7.5-7.95	G	0	Silty Clay												
	18/05/2023	33	BH120	0-0.1	G, A	0	F: Silty Clay	X			X								
	18/05/2023	34	BH120	0.1-0.3	G, A	0	F: Silty Clay												
	18/05/2023	35	BH120	0.3-0.45	G	0	F: Silty Clay												
	18/05/2023	36	BH120	0.5-0.75	G, A	0	Silty Clay		X										
	18/05/2023	37	BH120	1.5-1.95	G	0	Silty Gravelly Clay												
	18/05/2023	38	BH121	0-0.1	G, A	0	F: Silty Clay	X			X								
	18/05/2023	39	BH121	0.2-0.45	G, A	0	Silty Clay												
	18/05/2023	40	BH121	0.5-0.95	G, A	0	Silty Clay												
	18/05/2023	41	BH122	0.03-0.4	G, A	0	F: Gravelly Sand	X			X								
	18/05/2023	42	BH122	0.4-0.45	G	0	Silty Clay												
	18/05/2023	43	BH122	1.0-1.45	G, A	0	Silty Clay		X										
	18/05/2023	44	SV1	0.5-0.8	G, A	0	F: Silty Sand	X			X								
	17/05/2023	45	SDUP101	-	G	NA	Soil	X											
1	17/05/2023	—	SDUP102	-	G	NA	Soil	X		Please send to Melbourne Envirolab									
	18/05/2023	46	SDUP103	-	G	NA	Soil	X											
2	18/05/2023	—	SDUP104	-	G	NA	Soil	X		Please send to Melbourne Envirolab									
	18/05/2023	47	FR-S101-SPT	-	#	NA	Water		X										

Envirolab Services
25 Research Drive
Croydon South VIC 3136
Ph: (03) 9763 2500
ENVIROLAB
Job No: 37508
Date Received: 24/5/23
Time Received: 12:15pm
Received by: AP
Temp: Cool/Ambient
Cooling: Ice/Icepack 5.4
Security: Intact/Broken/None

Remarks (comments/detection limits required):	Sample Containers: G - 250mg Glass Jar A - 500mL Ziplock Asbestos Bag # - 1x500mL amber, 3xV, H

Relinquished By: KT	Date: 22.05.23	Time:	Received By:	Date:

Relinquished by : ELS Syd

Sarah P 23/05/23, 1330

Sarah

323727 om

Envirolab Services Pty Ltd
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CERTIFICATE OF ANALYSIS 37622

Client Details

Client	JK Environments
Attention	Katrina Taylor
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E35521PT**
Number of Samples	1 Soil
Date samples received	30/05/2023
Date completed instructions received	30/05/2023

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	05/06/2023
Date of Issue	02/06/2023

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Results Approved By
Chris De Luca, Assistant Lab Manager
Tara White, Metals Team Leader
Tianna Milburn, Senior Chemist

Authorised By
Pamela Adams, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		37622-1
Your Reference	UNITS	SDUP2
Date Sampled		22/05/2023
Type of sample		Soil
Date extracted	-	31/05/2023
Date analysed	-	31/05/2023
vTRH C_6 - C_9	mg/kg	<25
vTRH C_6 - C_{10}	mg/kg	<25
TRH 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 BTEX	mg/kg	<1
Total +ve Xylenes	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	92

TRH Soil C10-C40 NEPM		
Our Reference		37622-1
Your Reference	UNITS	SDUP2
Date Sampled		22/05/2023
Type of sample		Soil
Date extracted	-	31/05/2023
Date analysed	-	31/05/2023
TRH C_{10} - C_{14}	mg/kg	<50
TRH C_{15} - C_{28}	mg/kg	180
TRH C_{29} - C_{36}	mg/kg	230
Total +ve TRH (C10-C36)	mg/kg	410
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	340
TRH >C_{34} -C_{40}	mg/kg	120
Total +ve TRH (>C10-C40)	mg/kg	470
Surrogate o-Terphenyl	%	96

PAHs in Soil		
Our Reference		37622-1
Your Reference	UNITS	SDUP2
Date Sampled		22/05/2023
Type of sample		Soil
Date extracted	-	30/05/2023
Date analysed	-	31/05/2023
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	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b,j&k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
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	<0.1
Total +ve PAH's	mg/kg	<0.05
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-d_{14}	%	78

OCP in Soil		
Our Reference		37622-1
Your Reference	UNITS	SDUP2
Date Sampled		22/05/2023
Type of sample		Soil
Date extracted	-	30/05/2023
Date analysed	-	31/05/2023
alpha-BHC	mg/kg	<0.1
Hexachlorobenzene	mg/kg	<0.1
beta-BHC	mg/kg	<0.1
gamma-BHC	mg/kg	<0.1
Heptachlor	mg/kg	<0.1
delta-BHC	mg/kg	<0.1
Aldrin	mg/kg	<0.1
Heptachlor Epoxide	mg/kg	<0.1
gamma-Chlordane	mg/kg	<0.1
alpha-chlordane	mg/kg	<0.1
Endosulfan I	mg/kg	<0.1
pp-DDE	mg/kg	<0.1
Dieldrin	mg/kg	<0.1
Endrin	mg/kg	<0.1
Endosulfan II	mg/kg	<0.1
pp-DDD	mg/kg	<0.1
Endrin Aldehyde	mg/kg	<0.1
pp-DDT	mg/kg	<0.1
Endosulfan Sulphate	mg/kg	<0.1
Methoxychlor	mg/kg	<0.1
Total +ve reported Aldrin + Dieldrin	mg/kg	<0.1
Total +ve reported DDT+DDD+DDE	mg/kg	<0.1
Surrogate 2-chlorophenol-d4	%	78

OP in Soil		
Our Reference		37622-1
Your Reference	UNITS	SDUP2
Date Sampled		22/05/2023
Type of sample		Soil
Date extracted	-	30/05/2023
Date analysed	-	31/05/2023
Azinphos-methyl	mg/kg	<0.1
Bromophos-ethyl	mg/kg	<0.1
Chlorpyrifos	mg/kg	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1
Diazinon	mg/kg	<0.1
Dichlorovos	mg/kg	<0.1
Dimethoate	mg/kg	<0.1
Ethion	mg/kg	<0.1
Fenitrothion	mg/kg	<0.1
Malathion	mg/kg	<0.1
Parathion	mg/kg	<0.1
Ronnel	mg/kg	<0.1
Coumaphos	mg/kg	<0.1
Disulfoton	mg/kg	<0.1
Fenamiphos	mg/kg	<0.1
Fenthion	mg/kg	<0.1
Methidathion	mg/kg	<0.1
Mevinphos	mg/kg	<0.1
Methyl Parathion	mg/kg	<0.1
Phorate	mg/kg	<0.1
Phosalone	mg/kg	<0.1
Surrogate 2-chlorophenol-d4	%	78

PCBs in Soil		
Our Reference		37622-1
Your Reference	UNITS	SDUP2
Date Sampled		22/05/2023
Type of sample		Soil
Date extracted	-	30/05/2023
Date analysed	-	31/05/2023
Aroclor 1016	mg/kg	<0.1
Aroclor 1221	mg/kg	<0.1
Aroclor 1232	mg/kg	<0.1
Aroclor 1242	mg/kg	<0.1
Aroclor 1248	mg/kg	<0.1
Aroclor 1254	mg/kg	<0.1
Aroclor 1260	mg/kg	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1
Surrogate 2-fluorobiphenyl	%	76

Acid Extractable metals in soil		
Our Reference		37622-1
Your Reference	UNITS	SDUP2
Date Sampled		22/05/2023
Type of sample		Soil
Date digested	-	01/06/2023
Date analysed	-	01/06/2023
Arsenic	mg/kg	<4
Cadmium	mg/kg	<0.4
Chromium	mg/kg	39
Copper	mg/kg	27
Lead	mg/kg	14
Mercury	mg/kg	<0.1
Nickel	mg/kg	12
Zinc	mg/kg	52

Moisture		
Our Reference		37622-1
Your Reference	UNITS	SDUP2
Date Sampled		22/05/2023
Type of sample		Soil
Date prepared	-	31/05/2023
Date analysed	-	01/06/2023
Moisture	%	18

Method ID	Methodology Summary
Inorg-008	Moisture content determined by heating at 105°C for a minimum of 12 hours.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
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	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD or GC-MS. 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	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
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, For OCs 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.

Method ID	Methodology Summary
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. 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. 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.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			31/05/2023	[NT]	[NT]	[NT]	[NT]	31/05/2023	[NT]
Date analysed	-			31/05/2023	[NT]	[NT]	[NT]	[NT]	31/05/2023	[NT]
vTRH C_6 - C_9	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	101	[NT]
vTRH C_6 - C_{10}	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	101	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	[NT]	[NT]	[NT]	[NT]	92	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	[NT]	[NT]	[NT]	[NT]	100	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	105	[NT]
o-Xylene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Naphthalene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	94	[NT]	[NT]	[NT]	[NT]	90	[NT]

QUALITY CONTROL: TRH Soil C10-C40 NEPM					Duplicate					Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			31/05/2023	[NT]	[NT]	[NT]	[NT]	31/05/2023	[NT]
Date analysed	-			01/06/2023	[NT]	[NT]	[NT]	[NT]	01/06/2023	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	94	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	99	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	93	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	94	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	99	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	93	[NT]
Surrogate o-Terphenyl	%		Org-020	93	[NT]	[NT]	[NT]	[NT]	83	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			30/05/2023	[NT]	[NT]	[NT]	[NT]	30/05/2023	[NT]
Date analysed	-			31/05/2023	[NT]	[NT]	[NT]	[NT]	31/05/2023	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Fluorene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	86	[NT]
Pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	86	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Benzo(b,j&k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	[NT]	[NT]	[NT]	[NT]	96	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d_{14}	%		Org-022/025	92	[NT]	[NT]	[NT]	[NT]	92	[NT]

QUALITY CONTROL: OCP in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			30/05/2023	[NT]	[NT]	[NT]	[NT]	30/05/2023	[NT]
Date analysed	-			31/05/2023	[NT]	[NT]	[NT]	[NT]	31/05/2023	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	86	[NT]
Hexachlorobenzene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	80	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	108	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	80	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	80	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	72	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	82	[NT]
Endrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 2-chlorophenol-d4	%		Org-022/025	88	[NT]	[NT]	[NT]	[NT]	86	[NT]

QUALITY CONTROL: OP in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			30/05/2023	[NT]	[NT]	[NT]	[NT]	30/05/2023	[NT]
Date analysed	-			31/05/2023	[NT]	[NT]	[NT]	[NT]	31/05/2023	[NT]
Azinphos-methyl	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyrifos	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	90	[NT]
Diazinon	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Dichlorovos	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	120	[NT]
Fenitrothion	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	90	[NT]
Malathion	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Coumaphos	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Disulfoton	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fenamiphos	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fenthion	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Methidathion	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Mevinphos	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Methyl Parathion	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Phorate	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Phosalone	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 2-chlorophenol-d4	%		Org-022/025	88	[NT]	[NT]	[NT]	[NT]	86	[NT]

QUALITY CONTROL: PCBs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			30/05/2023	[NT]	[NT]	[NT]	[NT]	30/05/2023	[NT]
Date analysed	-			31/05/2023	[NT]	[NT]	[NT]	[NT]	31/05/2023	[NT]
Aroclor 1016	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	91	[NT]
Aroclor 1260	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 2-fluorobiphenyl	%		Org-022/025	92	[NT]	[NT]	[NT]	[NT]	90	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date digested	-			01/06/2023	[NT]	[NT]	[NT]	[NT]	01/06/2023	[NT]
Date analysed	-			01/06/2023	[NT]	[NT]	[NT]	[NT]	01/06/2023	[NT]
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	[NT]	[NT]	[NT]	[NT]	102	[NT]
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	[NT]	[NT]	[NT]	[NT]	102	[NT]
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	116	[NT]
Copper	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Lead	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	112	[NT]
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	[NT]	[NT]	[NT]	[NT]	130	[NT]
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	103	[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.

Envirolab Services Pty Ltd
ABN 37 112 535 645 - 002
25 Research Drive Croydon South VIC 3136
ph 03 9763 2500 fax 03 9763 2633
melbourne@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details	
Client	JK Environments
Attention	Katrina Taylor

Sample Login Details	
Your reference	E35521PT
Envirolab Reference	37622
Date Sample Received	30/05/2023
Date Instructions Received	30/05/2023
Date Results Expected to be Reported	05/06/2023

Sample Condition	
Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	1 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	10.7
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments
Nil

Please direct any queries to:

Pamela Adams	Chris De Luca
Phone: 03 9763 2500	**Phone: 03 9763 2500**
Fax: 03 9763 2633	**Fax: 03 9763 2633**
Email: padams@envirolab.com.au	**Email: cdeluca@envirolab.com.au**

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
ABN 37 112 535 645 - 002
25 Research Drive Croydon South VIC 3136
ph 03 9763 2500 fax 03 9763 2633
melbourne@envirolab.com.au
www.envirolab.com.au

Sample ID	vTRH(C6-C10)/BTEXN in Soil	TRH Soil C10-C40 NEPM	PAHs in Soil	OCP in Soil	OP in Soil	PCBsin Soil	Acid Extractable metalsin soil
SDUP2	✓	✓	✓	✓	✓	✓	✓

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.

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD 12 ASHLEY STREET CHATSWOOD NSW 2067 P: (02) 99106200 F: (02) 99106201 Attention: Aileen	JKE Job Number: E35521PT Date Results Required: STANDARD Page: 1 of 1	JKEnvironments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: Ktaylor@jkenvironments.com.au

Location: Blayney

Sampler: OB

Sample Preserved in Esky on Ice

Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	#6 - HM/TRH/BTEX	#3 - TRH/BTEXN/PA	Chromium IV	Asbestos (WA 500mL method)	Asbestos (Detection)	pH, CEC and clay content	VOCs (includes BTEX)	TCLP 6 Metals & PAHs	BTEX			
22/05/2023	1	BH102	0-0.2	G, A	0	F: Silty Clay	X			X								
22/05/2023	2	BH102	0.65-0.9	G, A	0	Silty Clay												
22/05/2023	3	BH103	0-0.2	G, A	0	F: Silty Clay	X			X								
22/05/2023	4	BH104	0-0.2	G, A	0	F: Silty Clay	X			X								
22/05/2023	5	BH104	0.4-0.6	G, A	0	F: Silty Clay												
22/05/2023	6	BH105	0-0.2	G, A	0	F: Silty Clay	X			X								
22/05/2023	7	BH105	0.4-0.7	G, A	0	Silty Clay												
23/05/2023	8	BH106	0-0.2	G, A	0	F: Silty Clay	X			X								
23/05/2023	9	BH106	0.8-1	G, A	0.1	Silty Clay												
23/05/2023	10	BH108	0-0.2	G, A	0	F: Silty Clay	X			X								
23/05/2023	11	BH108	0.8-1	G, A	0	Silty Clay												
22/05/2023	12	BH109	0-0.2	G, A	0	F: Silty Clay	X			X								
~~22/05/2023~~	13	~~BH109~~	~~0.8-1~~	~~G, A~~	~~0~~	~~Silty Clay~~												
22/05/2023	14	BH110	0-0.2	G, A	0	F: Silty Clay	X			X								
22/05/2023	15	BH111	0-0.2	G, A	0	F: Silty Clay	X			X								
22/05/2023	16	BH111	0.5-0.7	G, A	0	Silty Clay												
23/05/2023	17	BH112	0-0.2	G, A	2.5	F: Silty Clay	X			X								
23/05/2023	18	BH112	0.4-0.6	G, A	0.1	Silty Sandy Clay												
23/05/2023	19	BH112	0.6-0.8	G, A	1.3	Silty Sandy Clay												
23/05/2023	20	BH114	0-0.2	G, A	0	F: Silty Clay	X			X								
23/05/2023	21	BH114	0.8-1	G, A	0	Silty Clay												
23/05/2023	22	BH118	0-0.2	G, A	1.1	F: Silty Clay	X			X								
23/05/2023	23	BH118	0.6-0.8	G, A	0.3	Silty Clay												
23/05/2023	24	BH119	0-0.2	G, A	2.6	F: Silty Clay	X			X								
23/05/2023	25	BH119	0.9-1.1	G, A	0.9	Silty Clay												
22/05/2023	26	SDUP1	-	G	-	Fill	X											
22/05/2023	–	SDUP2	-	G	-	Fill	X	Please send to Melbourne Envirolab										
22/05/2023	27	SDUP3	-	G	-	Fill												
22/05/2023	28	SDUP4	-	G	-	Fill												
22/05/2023	29	FR-AUGER	-	V	-	Water		X										
22/05/2023	30	TB1	-	G	-	Sand		X										
22/05/2023	31	TS1	-	V	-	Sand									X			

Envirolab Services
25 Research Drive
Croydon South VIC 3136
Ph: (03) 9763 2500
ENVIROLAB
Job No: 32622
Date Received: 30/5/23
Time Received: 12.30
Received By: GS
Temp: Cool/Ambient 10.9
Cooling: Ice/Icepack
Security: Intact/Broken/None

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200
ENVIROLAB
Job No: 324186
Date Received: 26/05/23
Time Received: 1540
Received By: SP
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Remarks (comments/detection limits required):

Sample Containers:
G - 250mg Glass Jar
A - Ziplock Asbestos Bag
P - Plastic Bag

Relinquished By: KT	Date: 26.05.23	Time: 1540	Received By: ELS Syd	Date: 26/05/23

Relinquished by: ELS Syd
Sarah P 29/05/23, 1220
Saufer

Soil Vapour

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

CERTIFICATE OF ANALYSIS 323728

Client Details	
Client	JK Environments
Attention	Katrina Taylor
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details	
Your Reference	**E35521PT Blayney**
Number of Samples	3x1L canisters, 4x CT
Date samples received	22/05/2023
Date completed instructions received	22/05/2023

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	29/05/2023
Date of Issue	29/05/2023

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

Results Approved By
Amanda Chui, Air Toxics Team Leader
Dragana Tomas, Senior Chemist

Authorised By
Nancy Zhang, Laboratory Manager

TO15 in Canisters/Bags				
Our Reference		323728-1	323728-3	323728-5
Your Reference	UNITS	SV1	SV2	SVDUP1
Date Sampled		19/05/2023	19/05/2023	19/05/2023
Type of sample		Air	Air	Air
Air Kit Security No.		2279	1879	2272
Vacuum before Shipment	Hg"	-30	-30	-30
Vacuum before Analysis	Hg"	-8	-9	-7
Date prepared	-	23/05/2023	23/05/2023	23/05/2023
Date analysed	-	23/05/2023	23/05/2023	23/05/2023
Propylene	ppbv	190	140	200
Dichlorodifluoromethane	ppbv	<0.5	<0.5	<0.5
Chloromethane	ppbv	4	<0.5	4
1,2-Dichlorotetrafluoroethane	ppbv	<0.5	<0.5	<0.5
Vinyl chloride	ppbv	<0.5	<0.5	<0.5
1,3-Butadiene	ppbv	39	5.8	41
Bromomethane	ppbv	<0.5	<0.5	<0.5
Chloroethane	ppbv	<0.5	<0.5	<0.5
Ethanol	ppbv	20	20	10
Acrolein	ppbv	<5	<5	<5
Trichlorofluoromethane (Freon 11)	ppbv	<0.5	2	<0.5
Acetone	ppbv	64	<5	62
Isopropyl Alcohol	ppbv	6	<5	<5
1,1-Dichloroethene	ppbv	<0.5	<0.5	<0.5
1,1,2-Trichlorotrifluoroethane	ppbv	<0.5	<0.5	<0.5
Methylene chloride (Dichloromethane)	ppbv	<5	<5	<5
Carbon Disulfide	ppbv	6	<5	6
trans-1,2-dichloroethene	ppbv	<0.5	<0.5	<0.5
MTBE	ppbv	<0.5	<0.5	<0.5
1,1- Dichloroethane	ppbv	<0.5	<0.5	<0.5
Vinyl Acetate	ppbv	<0.5	<0.5	<0.5
MEK	ppbv	8	<5	7
Hexane	ppbv	6.7	5	7.0
cis-1,2-Dichloroethene	ppbv	<0.5	<0.5	<0.5
Ethyl Acetate	ppbv	<0.5	<0.5	<0.5
Chloroform	ppbv	52	51	52
Tetrahydrofuran	ppbv	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	ppbv	<0.5	<0.5	<0.5
1,2-Dichloroethane	ppbv	<0.5	<0.5	<0.5
Benzene	ppbv	59	2	61
Carbon tetrachloride	ppbv	<0.5	<0.5	<0.5

TO15 in Canisters/Bags				
Our Reference		323728-1	323728-3	323728-5
Your Reference	UNITS	SV1	SV2	SVDUP1
Date Sampled		19/05/2023	19/05/2023	19/05/2023
Type of sample		Air	Air	Air
Air Kit Security No.		2279	1879	2272
Cyclohexane	ppbv	0.6	<0.5	0.7
Heptane	ppbv	4	2	4
Trichloroethene	ppbv	<0.5	<0.5	<0.5
1,2-Dichloropropane	ppbv	<0.5	<0.5	<0.5
1,4-Dioxane	ppbv	<0.5	<0.5	<0.5
Bromodichloromethane	ppbv	4	3	4
Methyl Methacrylate	ppbv	<0.5	<0.5	<0.5
MIBK	ppbv	<5	<5	<5
cis-1,3-Dichloropropene	ppbv	<0.5	<0.5	<0.5
trans-1,3-Dichloropropene	ppbv	<0.5	<0.5	<0.5
Toluene	ppbv	26	18	27
1,1,2-Trichloroethane	ppbv	<0.5	<0.5	<0.5
Methyl Butyl Ketone	ppbv	<0.5	<0.5	<0.5
Dibromochloromethane	ppbv	<0.5	<0.5	<0.5
Tetrachloroethene	ppbv	<0.5	<0.5	<0.5
1,2-Dibromoethane	ppbv	<0.5	<0.5	<0.5
Chlorobenzene	ppbv	<0.5	<0.5	<0.5
Ethylbenzene	ppbv	3	3	3
m-& p-Xylene	ppbv	8	8	8
Styrene	ppbv	1	0.5	0.8
o-Xylene	ppbv	3	4	3
Bromoform	ppbv	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	ppbv	<0.5	<0.5	<0.5
4-ethyl toluene	ppbv	0.8	1	0.8
1,3,5-Trimethylbenzene	ppbv	1	1	1
1,2,4-Trimethylbenzene	ppbv	3	3	3
1,3-Dichlorobenzene	ppbv	<0.5	<0.5	<0.5
Benzyl chloride	ppbv	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	ppbv	1	2	1
1,2-Dichlorobenzene	ppbv	<0.5	<0.5	<0.5
1,2,4-Trichlorobenzene	ppbv	<0.5	<0.5	<0.5
Naphthalene	ppbv	<0.5	<0.5	<0.5
Hexachloro- 1,3-butadiene	ppbv	<0.5	<0.5	<0.5
Surrogate-Bromochloromethane	% rec	123	89	91
Surrogate -1,4-Difluorobenzene	% rec	121	96	98
Surrogate-Chlorobenzene-D5	% rec	121	95	98

TO15 in Canisters µg/m3				
Our Reference		323728-1	323728-3	323728-5
Your Reference	UNITS	SV1	SV2	SVDUP1
Date Sampled		19/05/2023	19/05/2023	19/05/2023
Type of sample		Air	Air	Air
Air Kit Security No.		2279	1879	2272
Vacuum before Shipment	Hg"	-30	-30	-30
Vacuum before Analysis	Hg"	-8	-9	-7
Date prepared	-	23/05/2023	23/05/2023	23/05/2023
Date analysed	-	23/05/2023	23/05/2023	23/05/2023
Propylene	µg/m^3	320	240	350
Dichlorodifluoromethane	µg/m^3	<2.5	<2.5	<2.5
Chloromethane	µg/m^3	7	<1	8
1,2-Dichlorotetrafluoroethane	µg/m^3	<2.5	<2.5	<2.5
Vinyl chloride	µg/m^3	<1.3	<1.3	<1.3
1,3-Butadiene	µg/m^3	87	13	91
Bromomethane	µg/m^3	<1.9	<1.9	<1.9
Chloroethane	µg/m^3	<1.3	<1.3	<1.3
Ethanol	µg/m^3	40	40	30
Acrolein	µg/m^3	<11	<11	<11
Trichlorofluoromethane (Freon 11)	µg/m^3	<2.8	10	<2.8
Acetone	µg/m^3	150	<11.9	150
Isopropyl Alcohol	µg/m^3	10	<12	<12
1,1-Dichloroethene	µg/m^3	<2	<2	<2
1,1,2-Trichlorotrifluoroethane	µg/m^3	<3.8	<3.8	<3.8
Methylene chloride (Dichloromethane)	µg/m^3	<17	<17	<17
Carbon Disulfide	µg/m^3	20	<16	20
trans-1,2-dichloroethene	µg/m^3	<2	<2	<2
MTBE	µg/m^3	<1.8	<1.8	<1.8
1,1- Dichloroethane	µg/m^3	<2	<2	<2
Vinyl Acetate	µg/m^3	<1.8	<1.8	<1.8
MEK	µg/m^3	23	<15	20
Hexane	µg/m^3	24	20	25
cis-1,2-Dichloroethene	µg/m^3	<2	<2	<2
Ethyl Acetate	µg/m^3	<1.8	<1.8	<1.8
Chloroform	µg/m^3	250	250	250
Tetrahydrofuran	µg/m^3	<1.5	<1.5	<1.5
1,1,1-Trichloroethane	µg/m^3	<2.7	<2.7	<2.7
1,2-Dichloroethane	µg/m^3	<2	<2	<2
Benzene	µg/m^3	190	6	190
Carbon tetrachloride	µg/m^3	<3.1	<3.1	<3.1

TO15 in Canisters µg/m3				
Our Reference		323728-1	323728-3	323728-5
Your Reference	UNITS	SV1	SV2	SVDUP1
Date Sampled		19/05/2023	19/05/2023	19/05/2023
Type of sample		Air	Air	Air
Air Kit Security No.		2279	1879	2272
Cyclohexane	µg/m^3	2	<1.7	2
Heptane	µg/m^3	20	7	20
Trichloroethene	µg/m^3	<2.7	<2.7	<2.7
1,2-Dichloropropane	µg/m^3	<2.3	<2.3	<2.3
1,4-Dioxane	µg/m^3	<1.8	<1.8	<1.8
Bromodichloromethane	µg/m^3	20	20	30
Methyl Methacrylate	µg/m^3	<2	<2	<2
MIBK	µg/m^3	<20	<20	<20
cis-1,3-Dichloropropene	µg/m^3	<2.3	<2.3	<2.3
trans-1,3-Dichloropropene	µg/m^3	<2.3	<2.3	<2.3
Toluene	µg/m^3	99	70	100
1,1,2-Trichloroethane	µg/m^3	<2.7	<2.7	<2.7
Methyl Butyl Ketone	µg/m^3	<2	<2	<2
Dibromochloromethane	µg/m^3	<1.6	<1.6	<1.6
Tetrachloroethene	µg/m^3	<3.4	<3.4	<3.4
1,2-Dibromoethane	µg/m^3	<3.8	<3.8	<3.8
Chlorobenzene	µg/m^3	<2.3	<2.3	<2.3
Ethylbenzene	µg/m^3	10	10	10
m-& p-Xylene	µg/m^3	30	40	30
Styrene	µg/m^3	5	2	3
o-Xylene	µg/m^3	10	20	20
Bromoform	µg/m^3	<5.2	<5.2	<5.2
1,1,2,2-Tetrachloroethane	µg/m^3	<3.4	<3.4	<3.4
4-ethyl toluene	µg/m^3	4	5	4
1,3,5-Trimethylbenzene	µg/m^3	6	6	7
1,2,4-Trimethylbenzene	µg/m^3	10	20	20
1,3-Dichlorobenzene	µg/m^3	<3	<3	<3
Benzyl chloride	µg/m^3	<2.6	<2.6	<2.6
1,4-Dichlorobenzene	µg/m^3	7	10	7
1,2-Dichlorobenzene	µg/m^3	<3	<3	<3
1,2,4-Trichlorobenzene	µg/m^3	<3.7	<3.7	<3.7
Naphthalene	µg/m^3	<2.6	<2.6	<2.6
Hexachloro- 1,3-butadiene	µg/m^3	<5.3	<5.3	<5.3
Surrogate-Bromochloromethane	% rec	123	89	91
Surrogate -1,4-Difluorobenzene	% rec	121	96	98
Surrogate-Chlorobenzene-D5	% rec	121	95	98

TPH Air/ Air Phase Hydrocarbon				
Our Reference		323728-1	323728-3	323728-5
Your Reference	UNITS	SV1	SV2	SVDUP1
Date Sampled		19/05/2023	19/05/2023	19/05/2023
Type of sample		Air	Air	Air
Air Kit Security No.		2279	1879	2272
Date prepared	-	23/05/2023	23/05/2023	23/05/2023
Date analysed	-	23/05/2023	23/05/2023	23/05/2023
TPH C_5 - C_8 Aliphatic	µg/m³	880	430	890
TPH C_9 - C_{12} Aliphatic	µg/m³	170	260	140
TPH C_9 - C_{10} Aromatic	µg/m³	<100	<100	<100
TPH C_6 - C_{10} - BTEX (F1)	µg/m³	<200	<200	<200
TPH >C_{10} - C_{12} - Naphthalene (F2)	µg/m³	130	210	100

VOC in Carbon tubes		
Our Reference		323728-7
Your Reference	UNITS	Shroud
Date Sampled		19/05/2023
Type of sample		Air
Air Kit Security No.		171504439
Date extracted	-	26/05/2023
Date analysed	-	26/05/2023
Isopropyl Alcohol*	µg/tube	10
Surrogate Toluene-d8	%	90
Surrogate 4-Bromofluorobenzene	%	80

VOC in Carbon tubes		
Our Reference		323728-7
Your Reference	UNITS	Shroud
Date Sampled		19/05/2023
Type of sample		Air
Air Kit Security No.		171504439
Date prepared	-	26/05/2023
Date analysed	-	26/05/2023
Tube Sampling rate	mL/min	100
Tube Sampling Time	mins	0.5
Volume sampled	m^3	0.00005000
Isopropyl Alcohol	$\mu g/m^3$	260,000

Method ID	Methodology Summary
AT-005	Measurement of Air-Phase Petroleum Hydrocarbons and Ozone Precursors by GC-MS.
ORG-022	Determination of volatile organic compounds in charcoal tubes/badges/sorbents using CS2 extraction, determined by GC/GC-MS. Desorption efficiencies are not applied to results. Note where µg/m^3 results are supplied for SKC badges, the factors used are for 575-001, if 575-001 data is unavailable for an analyte then use 575-002 then 575-003 (exposure time must be supplied). Otherwise a sampling rate may be used for a similar analyte on request. Analytes such as (where applicable) Iodomethane, Chloroprene, Nitrobenzene, Naphthalene and 1, 2, 3 // 1, 2, 4 Trichlorobenzenes are considered to be semi-quant analyses using CS2 desorption from charcoal tubes. The latter three compounds are better served by XAD-2 collection and analysis. Note - air volume measurements are not covered by Envirolab's NATA accreditation.
TO15	USEPA TO15 - Analysis of VOC's in air using USEPA TO15 and in house method AT-002. Note, longer term stability of some oxygenated compounds is questionable where significant humidity is present.
USEPA 18	Measurement of Gaseous Organic Compound Emissions by Gas Chromatography using USEPA m18.

QUALITY CONTROL: TO15 in Canisters/Bags					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Vacuum before Shipment	Hg"			[NT]	1	-30	-30	0	[NT]	[NT]
Vacuum before Analysis	Hg"			[NT]	1	-8	-8	0	[NT]	[NT]
Date prepared	-			23/05/2023	1	23/05/2023	23/05/2023		23/05/2023	[NT]
Date analysed	-			23/05/2023	1	23/05/2023	23/05/2023		23/05/2023	[NT]
Propylene	ppbv	0.5	TO15	<0.5	1	190	190	0	111	[NT]
Dichlorodifluoromethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Chloromethane	ppbv	0.5	TO15	<0.5	1	4	4	0	[NT]	[NT]
1,2-Dichlorotetrafluoroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Vinyl chloride	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,3-Butadiene	ppbv	0.5	TO15	<0.5	1	39	41	5	[NT]	[NT]
Bromomethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Chloroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Ethanol	ppbv	5	TO15	<5	1	20	20	0	[NT]	[NT]
Acrolein	ppbv	5	TO15	<5	1	<5	<5	0	[NT]	[NT]
Trichlorofluoromethane (Freon 11)	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Acetone	ppbv	5	TO15	<5	1	64	65	2	[NT]	[NT]
Isopropyl Alcohol	ppbv	5	TO15	<5	1	6	6	0	[NT]	[NT]
1,1-Dichloroethene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,1,2-Trichlorotrifluoroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Methylene chloride (Dichloromethane)	ppbv	5	TO15	<5	1	<5	<5	0	[NT]	[NT]
Carbon Disulfide	ppbv	5	TO15	<5	1	6	6	0	[NT]	[NT]
trans-1,2-dichloroethene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
MTBE	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,1- Dichloroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Vinyl Acetate	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
MEK	ppbv	5	TO15	<5	1	8	8	0	[NT]	[NT]
Hexane	ppbv	0.5	TO15	<0.5	1	6.7	7.0	4	100	[NT]
cis-1,2-Dichloroethene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Ethyl Acetate	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Chloroform	ppbv	0.5	TO15	<0.5	1	52	52	0	[NT]	[NT]
Tetrahydrofuran	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,1,1-Trichloroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,2-Dichloroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Benzene	ppbv	0.5	TO15	<0.5	1	59	60	2	98	[NT]
Carbon tetrachloride	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Cyclohexane	ppbv	0.5	TO15	<0.5	1	0.6	0.7	15	94	[NT]
Heptane	ppbv	0.5	TO15	<0.5	1	4	4	0	105	[NT]

QUALITY CONTROL: TO15 in Canisters/Bags						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Trichloroethene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,2-Dichloropropane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,4-Dioxane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Bromodichloromethane	ppbv	0.5	TO15	<0.5	1	4	4	0	[NT]	[NT]
Methyl Methacrylate	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
MIBK	ppbv	5	TO15	<5	1	<5	<5	0	[NT]	[NT]
cis-1,3-Dichloropropene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
trans-1,3-Dichloropropene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Toluene	ppbv	0.5	TO15	<0.5	1	26	27	4	102	[NT]
1,1,2-Trichloroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Methyl Butyl Ketone	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Dibromochloromethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Tetrachloroethene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,2-Dibromoethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Chlorobenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	ppbv	0.5	TO15	<0.5	1	3	3	0	101	[NT]
m-& p-Xylene	ppbv	1	TO15	<1	1	8	8	0	99	[NT]
Styrene	ppbv	0.5	TO15	<0.5	1	1	1	0	97	[NT]
o-Xylene	ppbv	0.5	TO15	<0.5	1	3	3	0	102	[NT]
Bromoform	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,1,2,2-Tetrachloroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
4-ethyl toluene	ppbv	0.5	TO15	<0.5	1	0.8	0.8	0	99	[NT]
1,3,5-Trimethylbenzene	ppbv	0.5	TO15	<0.5	1	1	1	0	95	[NT]
1,2,4-Trimethylbenzene	ppbv	0.5	TO15	<0.5	1	3	3	0	95	[NT]
1,3-Dichlorobenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Benzyl chloride	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,4-Dichlorobenzene	ppbv	0.5	TO15	<0.5	1	1	1	0	[NT]	[NT]
1,2-Dichlorobenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,2,4-Trichlorobenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Naphthalene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Hexachloro- 1,3-butadiene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Surrogate-Bromochloromethane	% rec		TO15	102	1	123	130	6	108	[NT]
Surrogate -1,4-Difluorobenzene	% rec		TO15	96	1	121	129	6	102	[NT]
Surrogate-Chlorobenzene-D5	% rec		TO15	94	1	121	128	6	102	[NT]

QUALITY CONTROL: TO15 in Canisters µg/m3					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Vacuum before Shipment	Hg"			[NT]	1	-30	-30	0	[NT]	[NT]
Vacuum before Analysis	Hg"			[NT]	1	-8	-8	0	[NT]	[NT]
Date prepared	-			23/05/2023	1	23/05/2023	23/05/2023		[NT]	[NT]
Date analysed	-			23/05/2023	1	23/05/2023	23/05/2023		[NT]	[NT]
Propylene	µg/m³	0.9	TO15	<0.9	1	320	330	3	[NT]	[NT]
Dichlorodifluoromethane	µg/m³	2.5	TO15	<2.5	1	<2.5	<2.5	0	[NT]	[NT]
Chloromethane	µg/m³	1.0	TO15	<1.0	1	7	7	0	[NT]	[NT]
1,2-Dichlorotetrafluoroethane	µg/m³	2.5	TO15	<2.5	1	<2.5	<2.5	0	[NT]	[NT]
Vinyl chloride	µg/m³	1.3	TO15	<1.3	1	<1.3	<1.3	0	[NT]	[NT]
1,3-Butadiene	µg/m³	1.1	TO15	<1.1	1	87	90	3	[NT]	[NT]
Bromomethane	µg/m³	1.9	TO15	<1.9	1	<1.9	<1.9	0	[NT]	[NT]
Chloroethane	µg/m³	1.3	TO15	<1.3	1	<1.3	<1.3	0	[NT]	[NT]
Ethanol	µg/m³	9	TO15	<9	1	40	40	0	[NT]	[NT]
Acrolein	µg/m³	11	TO15	<11	1	<11	<11	0	[NT]	[NT]
Trichlorofluoromethane (Freon 11)	µg/m³	2.8	TO15	<2.8	1	<2.8	<2.8	0	[NT]	[NT]
Acetone	µg/m³	11.9	TO15	<11.9	1	150	150	0	[NT]	[NT]
Isopropyl Alcohol	µg/m³	12	TO15	<12	1	10	10	0	[NT]	[NT]
1,1-Dichloroethene	µg/m³	2.0	TO15	<2.0	1	<2	<2	0	[NT]	[NT]
1,1,2-Trichlorotrifluoroethane	µg/m³	3.8	TO15	<3.8	1	<3.8	<3.8	0	[NT]	[NT]
Methylene chloride (Dichloromethane)	µg/m³	17	USEPA 18	<17	1	<17	<17	0	[NT]	[NT]
Carbon Disulfide	µg/m³	16	TO15	<16	1	20	20	0	[NT]	[NT]
trans-1,2-dichloroethene	µg/m³	2.0	TO15	<2.0	1	<2	<2	0	[NT]	[NT]
MTBE	µg/m³	1.8	TO15	<1.8	1	<1.8	<1.8	0	[NT]	[NT]
1,1- Dichloroethane	µg/m³	2.0	TO15	<2.0	1	<2	<2	0	[NT]	[NT]
Vinyl Acetate	µg/m³	1.8	TO15	<1.8	1	<1.8	<1.8	0	[NT]	[NT]
MEK	µg/m³	15	TO15	<15	1	23	23	0	[NT]	[NT]
Hexane	µg/m³	1.8	TO15	<1.8	1	24	24	0	[NT]	[NT]
cis-1,2-Dichloroethene	µg/m³	2.0	TO15	<2.0	1	<2	<2	0	[NT]	[NT]
Ethyl Acetate	µg/m³	1.8	TO15	<1.8	1	<1.8	<1.8	0	[NT]	[NT]
Chloroform	µg/m³	2.4	TO15	<2.4	1	250	250	0	[NT]	[NT]
Tetrahydrofuran	µg/m³	1.5	TO15	<1.5	1	<1.5	<1.5	0	[NT]	[NT]
1,1,1-Trichloroethane	µg/m³	2.7	TO15	<2.7	1	<2.7	<2.7	0	[NT]	[NT]
1,2-Dichloroethane	µg/m³	2.0	TO15	<2.0	1	<2	<2	0	[NT]	[NT]
Benzene	µg/m³	1.6	TO15	<1.6	1	190	190	0	[NT]	[NT]
Carbon tetrachloride	µg/m³	3.1	TO15	<3.1	1	<3.1	<3.1	0	[NT]	[NT]
Cyclohexane	µg/m³	1.7	TO15	<1.7	1	2	2	0	[NT]	[NT]
Heptane	µg/m³	2.0	TO15	<2.0	1	20	20	0	[NT]	[NT]

QUALITY CONTROL: TO15 in Canisters µg/m3					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Trichloroethene	µg/m³	2.7	TO15	<2.7	1	<2.7	<2.7	0	[NT]	[NT]
1,2-Dichloropropane	µg/m³	2.3	TO15	<2.3	1	<2.3	<2.3	0	[NT]	[NT]
1,4-Dioxane	µg/m³	1.8	TO15	<1.8	1	<1.8	<1.8	0	[NT]	[NT]
Bromodichloromethane	µg/m³	3.4	TO15	<3.4	1	20	20	0	[NT]	[NT]
Methyl Methacrylate	µg/m³	2.0	TO15	<2.0	1	<2	<2	0	[NT]	[NT]
MIBK	µg/m³	20	TO15	<20	1	<20	<20	0	[NT]	[NT]
cis-1,3-Dichloropropene	µg/m³	2.3	TO15	<2.3	1	<2.3	<2.3	0	[NT]	[NT]
trans-1,3-Dichloropropene	µg/m³	2.3	TO15	<2.3	1	<2.3	<2.3	0	[NT]	[NT]
Toluene	µg/m³	1.9	TO15	<1.9	1	99	100	1	[NT]	[NT]
1,1,2-Trichloroethane	µg/m³	2.7	TO15	<2.7	1	<2.7	<2.7	0	[NT]	[NT]
Methyl Butyl Ketone	µg/m³	2.0	TO15	<2.0	1	<2	<2	0	[NT]	[NT]
Dibromochloromethane	µg/m³	1.6	TO15	<1.6	1	<1.6	<1.6	0	[NT]	[NT]
Tetrachloroethene	µg/m³	3.4	TO15	<3.4	1	<3.4	<3.4	0	[NT]	[NT]
1,2-Dibromoethane	µg/m³	3.8	TO15	<3.8	1	<3.8	<3.8	0	[NT]	[NT]
Chlorobenzene	µg/m³	2.3	TO15	<2.3	1	<2.3	<2.3	0	[NT]	[NT]
Ethylbenzene	µg/m³	2.2	TO15	<2.2	1	10	10	0	[NT]	[NT]
m-& p-Xylene	µg/m³	4.3	TO15	<4.3	1	30	30	0	[NT]	[NT]
Styrene	µg/m³	2.1	TO15	<2.1	1	5	5	0	[NT]	[NT]
o-Xylene	µg/m³	2.2	TO15	<2.2	1	10	10	0	[NT]	[NT]
Bromoform	µg/m³	5.2	TO15	<5.2	1	<5.2	<5.2	0	[NT]	[NT]
1,1,2,2-Tetrachloroethane	µg/m³	3.4	TO15	<3.4	1	<3.4	<3.4	0	[NT]	[NT]
4-ethyl toluene	µg/m³	2.5	TO15	<2.5	1	4	4	0	[NT]	[NT]
1,3,5-Trimethylbenzene	µg/m³	2.5	TO15	<2.5	1	6	7	15	[NT]	[NT]
1,2,4-Trimethylbenzene	µg/m³	2.5	TO15	<2.5	1	10	10	0	[NT]	[NT]
1,3-Dichlorobenzene	µg/m³	3.0	TO15	<3.0	1	<3	<3	0	[NT]	[NT]
Benzyl chloride	µg/m³	2.6	TO15	<2.6	1	<2.6	<2.6	0	[NT]	[NT]
1,4-Dichlorobenzene	µg/m³	3.0	TO15	<3.0	1	7	7	0	[NT]	[NT]
1,2-Dichlorobenzene	µg/m³	3.0	TO15	<3.0	1	<3	<3	0	[NT]	[NT]
1,2,4-Trichlorobenzene	µg/m³	3.7	TO15	<3.7	1	<3.7	<3.7	0	[NT]	[NT]
Naphthalene	µg/m³	2.6	TO15	<2.6	1	<2.6	<2.6	0	[NT]	[NT]
Hexachloro- 1,3-butadiene	µg/m³	5.3	TO15	<5.3	1	<5.3	<5.3	0	[NT]	[NT]
Surrogate-Bromochloromethane	% rec		TO15	102	1	123	130	6	[NT]	[NT]
Surrogate -1,4-Difluorobenzene	% rec		TO15	96	1	121	129	6	[NT]	[NT]
Surrogate-Chlorobenzene-D5	% rec		TO15	94	1	121	128	6	[NT]	[NT]

QUALITY CONTROL: TPH Air/ Air Phase Hydrocarbon					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			23/05/2023	1	23/05/2023	23/05/2023		23/05/2023	[NT]
Date analysed	-			23/05/2023	1	23/05/2023	23/05/2023		23/05/2023	[NT]
TPH C_5 - C_8 Aliphatic	µg/m³	200	AT-005	<200	1	880	830	6	114	[NT]
TPH C_9 - C_{12} Aliphatic	µg/m³	50	AT-005	<50	1	170	150	12	[NT]	[NT]
TPH C_9 - C_{10} Aromatic	µg/m³	100	AT-005	<100	1	<100	<100	0	116	[NT]
TPH C_6 - C_{10} - BTEX (F1)	µg/m³	200	TO15	<200	1	<200	<200	0	111	[NT]
TPH >C_{10} - C_{12} - Naphthalene (F2)	µg/m³	40	TO15	<40	1	130	120	8	111	[NT]

QUALITY CONTROL: VOC in Carbon tubes					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			26/05/2023	[NT]	[NT]	[NT]	[NT]	26/05/2023	[NT]
Date analysed	-			26/05/2023	[NT]	[NT]	[NT]	[NT]	26/05/2023	[NT]
Isopropyl Alcohol*	µg/tube	5	ORG-022	<5	[NT]	[NT]	[NT]	[NT]	99	[NT]
Surrogate Toluene-d8	%		ORG-022	97	[NT]	[NT]	[NT]	[NT]	109	[NT]
Surrogate 4-Bromofluorobenzene	%		ORG-022	103	[NT]	[NT]	[NT]	[NT]	104	[NT]

QUALITY CONTROL: VOC in Carbon tubes					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			26/05/2023	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Date analysed	-			26/05/2023	[NT]	[NT]	[NT]	[NT]	[NT]	[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.

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	JK Environments
Attention	Katrina Taylor

Sample Login Details	
Your reference	E35521PT Blayney
Envirolab Reference	323728
Date Sample Received	22/05/2023
Date Instructions Received	22/05/2023
Date Results Expected to be Reported	29/05/2023

Sample Condition	
Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	3x1L canisters, 4x CT
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	n/a
Cooling Method	Not applicable
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:

Envirolab Services Pty Ltd
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Sample ID	TO15 in Canisters/Bags	TO15 in Canisters µg/m3	TPH Air/ Air Phase Hydrocarbon	VOC in Carbon tubes	VOC in Carbon tubes	On Hold
SV1	✓	✓	✓			
SV1						✓
SV2	✓	✓	✓			
SV2						✓
SVDUP1	✓	✓	✓			
SVDUP1						✓
Shroud				✓	✓	

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 GROUP ENVIROLAB SERVICES mpl

CHAIN OF CUSTODY - CANISTERS / BAGS / TD TUBES

Sydney Lab - Envirolab Services
12 Ashley St, Chatswood, NSW 2067
02 9910 6200 |
sydney@envirolab.com.au

Perth Lab - MPL Laboratories
16-18 Hayden Crt, Myaree, WA 6154
08 9317 2505 |
lab@mpl.com.au

Melbourne Lab - Envirolab Services
25 Research Drive, Croydon South, VIC 3136
03 9763 2500 |
melbourne@envirolab.c

Client: JK Environments
Contact Person: Katrina Taylor
Project Mgr: Katrina Taylor
Sampler: Harley Wang
Address: 115 Wicks Road, Macquarie Park, NSW
Phone: 9888 5000 Mob:
Email: ktaylor@jkenvironments.com.au

Client Project Name / Number / Site etc. (i.e. report title):
PO No.: E35521PT Blayney
Envirolab Quote No. :
Date results required:
Or choose: standard
Note: Inform lab in advance if urgent turnaround is required - surcharges apply
Additional report format: esdat / equis /
Lab Comments:

Envirolab Sample ID	Client Sample ID (Field Location)	Canister / TD Tube #	Carbon Tube #	Carbon Tube Sample Volume	Soil Gas Train / Mass Flow Controller #	Leak Test Passed (Y/N)	Purge Volume	PID Reading (ppmv)	Date of Collection	Collection Time: Time On	Collection Time: Time Off	Canister Vacuum ("Hg"): Initial	Canister Vacuum ("Hg"): Final	Flow Rate (Bags/TD Tubes only)	Tests Required: TO-15 (Cans)	TRH (F1 & F2)	IPA	Comments
-1	SV1	2279	-2 171504445	500mL	399	Yes	300mL	0.6	19/05/2023	11:14am	11:32am	-27Hg"	-6Hg"	100mL/min	X	X		
-3	SV2	1879	-4 171504443	500mL	2317	Yes	300mL	0.8	19/05/2023	12:00pm	12:15pm	-27Hg"	-6Hg"	100mL/min	X	X		
-5	SVDUP1	2272	-6 171504440	500mL	1983	Yes	100mL	NA	19/05/2023	11:14am	11:31am	-29Hg"	-6Hg"	100mL/min	X	X		
-7	Shroud	-	171504439	50mL	-	-	-	NA	19/05/2023	11:40am	11:42am	-	-	-			X	

* General Gases - Please tick one:

☐ 1) Methane, Oxygen, Carbon dioxide, Carbon monoxide, Nitrogen
☐ 2) Methane, Oxygen, Carbon dioxide, Carbon monoxide, Helium, Hydrogen
☐ 3) Specify analytes (NB: If both Nitrogen and Helium/Hydrogen are require, please contact the laboratory

Relinquished by (Company): JK Environments	Received by (Company): ELS SYD	*Lab Use Only:*
Print Name: Harley Wang	Print Name: Jue Wang	Job Number: 323728
Date & Time: 22/05/2023 9:30am	Date & Time: 22/05/2023 16:30	Security seal: Intact / Broken / None
Signature: HW	Signature:	TAT Req - SAME day / 1 / 2 / 3 / 4 / STD

TERMS AND CONDITIONS FOR PROVISION OF SAMPLING EQUIPMENT

In these terms and conditions "Envirolab" means Envirolab Services Pty Ltd, 'MPL" means "Envirolab Services (WA) Pty Ltd" and "customer" means the organisation or individual who effectively hires the sampling equipment provided by Envirolab and MPL. "Sampling equipment" means canisters, passive flow restrictors, timed flow meters and all associated packaging. Envirolab and MPL are part of the Envirolab group.

Groundwater

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CERTIFICATE OF ANALYSIS 324180

Client Details	
Client	JK Environments
Attention	Katrina Taylor
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details	
Your Reference	**E35521PT**
Number of Samples	10 Water
Date samples received	26/05/2023
Date completed instructions received	26/05/2023

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	02/06/2023
Date of Issue	02/06/2023
Reissue Details	This report replaces R00 created on 01/06/2023 due to: revised report with additional results (Sample #6 pH & EC).

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Results Approved By
Kyle Gavrily, Senior Chemist
Liam Timmins, Organics Supervisor
Loren Bardwell, Development Chemist
Priya Samarawickrama, Senior Chemist

Authorised By
Nancy Zhang, Laboratory Manager

VOCs in water						
Our Reference		324180-1	324180-2	324180-3	324180-4	324180-5
Your Reference	UNITS	MW12	MW14	MW15	MW101	MW116
Date Sampled		24/05/2023	25/05/2023	25/05/2023	24/05/2023	24/05/2023
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	29/05/2023	29/05/2023	29/05/2023	29/05/2023	29/05/2023
Date analysed	-	30/05/2023	30/05/2023	30/05/2023	30/05/2023	30/05/2023
Dichlorodifluoromethane	µg/L	<10	<10	<10	<10	<10
Chloromethane	µg/L	<10	<10	<10	<10	<10
Vinyl Chloride	µg/L	<10	<10	<10	<10	<10
Bromomethane	µg/L	<10	<10	<10	<10	<10
Chloroethane	µg/L	<10	<10	<10	<10	<10
Trichlorofluoromethane	µg/L	<10	<10	<10	<10	<10
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1	<1	<1	<1
1,1-dichloroethane	µg/L	<1	<1	<1	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1	<1	<1
Chloroform	µg/L	<1	<1	<1	<1	<1
2,2-dichloropropane	µg/L	<1	<1	<1	<1	<1
1,2-dichloroethane	µg/L	<1	<1	<1	<1	<1
1,1,1-trichloroethane	µg/L	<1	<1	<1	<1	<1
1,1-dichloropropene	µg/L	<1	<1	<1	<1	<1
Cyclohexane	µg/L	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1	<1
Benzene	µg/L	<1	<1	<1	<1	<1
Dibromomethane	µg/L	<1	<1	<1	<1	<1
1,2-dichloropropane	µg/L	<1	<1	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1	<1	<1
Bromodichloromethane	µg/L	<1	<1	<1	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1	<1	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1	<1	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1	<1	<1	<1
Toluene	µg/L	1	<1	<1	<1	<1
1,3-dichloropropane	µg/L	<1	<1	<1	<1	<1
Dibromochloromethane	µg/L	<1	<1	<1	<1	<1
1,2-dibromoethane	µg/L	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1	<1	<1	<1
Chlorobenzene	µg/L	<1	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1	<1

VOCs in water						
Our Reference	UNITS	324180-1	324180-2	324180-3	324180-4	324180-5
Your Reference		MW12	MW14	MW15	MW101	MW116
Date Sampled		24/05/2023	25/05/2023	25/05/2023	24/05/2023	24/05/2023
Type of sample		Water	Water	Water	Water	Water
Bromoform	µg/L	<1	<1	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2	<2	<2
Styrene	µg/L	<1	<1	<1	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1	<1	<1	<1
o-xylene	µg/L	<1	<1	<1	<1	<1
1,2,3-trichloropropane	µg/L	<1	<1	<1	<1	<1
Isopropylbenzene	µg/L	<1	<1	<1	<1	<1
Bromobenzene	µg/L	<1	<1	<1	<1	<1
n-propyl benzene	µg/L	<1	<1	<1	<1	<1
2-chlorotoluene	µg/L	<1	<1	<1	<1	<1
4-chlorotoluene	µg/L	<1	<1	<1	<1	<1
1,3,5-trimethyl benzene	µg/L	<1	<1	<1	<1	<1
Tert-butyl benzene	µg/L	<1	<1	<1	<1	<1
1,2,4-trimethyl benzene	µg/L	<1	<1	<1	<1	<1
1,3-dichlorobenzene	µg/L	<1	<1	<1	<1	<1
Sec-butyl benzene	µg/L	<1	<1	<1	<1	<1
1,4-dichlorobenzene	µg/L	<1	<1	<1	<1	<1
4-isopropyl toluene	µg/L	<1	<1	<1	<1	<1
1,2-dichlorobenzene	µg/L	<1	<1	<1	<1	<1
n-butyl benzene	µg/L	<1	<1	<1	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1	<1	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1	<1	<1	<1
Hexachlorobutadiene	µg/L	<1	<1	<1	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	119	112	118	118	114
Surrogate toluene-d8	%	114	108	112	113	109
Surrogate 4-BFB	%	104	102	103	103	102

VOCs in water			
Our Reference		324180-6	324180-7
Your Reference	UNITS	MW117	WDUP1
Date Sampled		23/05/2023	-
Type of sample		Water	Water
Date extracted	-	29/05/2023	29/05/2023
Date analysed	-	30/05/2023	30/05/2023
Dichlorodifluoromethane	µg/L	<10	<10
Chloromethane	µg/L	<10	<10
Vinyl Chloride	µg/L	<10	<10
Bromomethane	µg/L	<10	<10
Chloroethane	µg/L	<10	<10
Trichlorofluoromethane	µg/L	<10	<10
1,1-Dichloroethene	µg/L	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1
1,1-dichloroethane	µg/L	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1
Bromochloromethane	µg/L	<1	<1
Chloroform	µg/L	<1	<1
2,2-dichloropropane	µg/L	<1	<1
1,2-dichloroethane	µg/L	<1	<1
1,1,1-trichloroethane	µg/L	<1	<1
1,1-dichloropropene	µg/L	<1	<1
Cyclohexane	µg/L	<1	<1
Carbon tetrachloride	µg/L	<1	<1
Benzene	µg/L	<1	<1
Dibromomethane	µg/L	<1	<1
1,2-dichloropropane	µg/L	<1	<1
Trichloroethene	µg/L	<1	<1
Bromodichloromethane	µg/L	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1
Toluene	µg/L	<1	<1
1,3-dichloropropane	µg/L	<1	<1
Dibromochloromethane	µg/L	<1	<1
1,2-dibromoethane	µg/L	<1	<1
Tetrachloroethene	µg/L	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1
Chlorobenzene	µg/L	<1	<1
Ethylbenzene	µg/L	<1	<1

VOCs in water			
Our Reference		324180-6	324180-7
Your Reference	UNITS	MW117	WDUP1
Date Sampled		23/05/2023	-
Type of sample		Water	Water
Bromoform	µg/L	<1	<1
m+p-xylene	µg/L	<2	<2
Styrene	µg/L	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1
o-xylene	µg/L	<1	<1
1,2,3-trichloropropane	µg/L	<1	<1
Isopropylbenzene	µg/L	<1	<1
Bromobenzene	µg/L	<1	<1
n-propyl benzene	µg/L	<1	<1
2-chlorotoluene	µg/L	<1	<1
4-chlorotoluene	µg/L	<1	<1
1,3,5-trimethyl benzene	µg/L	<1	<1
Tert-butyl benzene	µg/L	<1	<1
1,2,4-trimethyl benzene	µg/L	<1	<1
1,3-dichlorobenzene	µg/L	<1	<1
Sec-butyl benzene	µg/L	<1	<1
1,4-dichlorobenzene	µg/L	<1	<1
4-isopropyl toluene	µg/L	<1	<1
1,2-dichlorobenzene	µg/L	<1	<1
n-butyl benzene	µg/L	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1
Hexachlorobutadiene	µg/L	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1
Surrogate Dibromofluoromethane	%	118	117
Surrogate toluene-d8	%	113	111
Surrogate 4-BFB	%	103	102

vTRH(C6-C10)/BTEXN in Water						
Our Reference		324180-1	324180-2	324180-3	324180-4	324180-5
Your Reference	UNITS	MW12	MW14	MW15	MW101	MW116
Date Sampled		24/05/2023	25/05/2023	25/05/2023	24/05/2023	24/05/2023
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	29/05/2023	29/05/2023	29/05/2023	29/05/2023	29/05/2023
Date analysed	-	30/05/2023	30/05/2023	30/05/2023	30/05/2023	30/05/2023
TRH C_6 - C_9	µg/L	<10	<10	<10	<10	<10
TRH C_6 - C_{10}	µg/L	<10	<10	<10	<10	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10	<10	<10	<10	<10
Benzene	µg/L	<1	<1	<1	<1	<1
Toluene	µg/L	1	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2	<2	<2
o-xylene	µg/L	<1	<1	<1	<1	<1
Naphthalene	µg/L	<1	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	119	112	118	118	114
Surrogate toluene-d8	%	114	108	112	113	109
Surrogate 4-BFB	%	104	102	103	103	102

vTRH(C6-C10)/BTEXN in Water					
Our Reference		324180-6	324180-7	324180-9	324180-10
Your Reference	UNITS	MW117	WDUP1	TB-W1	TS-W1
Date Sampled		23/05/2023	-	23-25/5/23	23-25/5/23
Type of sample		Water	Water	Water	Water
Date extracted	-	29/05/2023	29/05/2023	29/05/2023	29/05/2023
Date analysed	-	30/05/2023	30/05/2023	30/05/2023	30/05/2023
TRH C_6 - C_9	µg/L	<10	<10	<10	[NA]
TRH C_6 - C_{10}	µg/L	<10	<10	<10	[NA]
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10	<10	<10	[NA]
Benzene	µg/L	<1	<1	<1	99%
Toluene	µg/L	<1	<1	<1	128%
Ethylbenzene	µg/L	<1	<1	<1	116%
m+p-xylene	µg/L	<2	<2	<2	127%
o-xylene	µg/L	<1	<1	<1	122%
Naphthalene	µg/L	<1	<1	<1	[NA]
Surrogate Dibromofluoromethane	%	118	117	119	103
Surrogate toluene-d8	%	113	111	113	104
Surrogate 4-BFB	%	103	102	104	111

svTRH (C10-C40) in Water						
Our Reference		324180-1	324180-2	324180-3	324180-4	324180-5
Your Reference	UNITS	MW12	MW14	MW15	MW101	MW116
Date Sampled		24/05/2023	25/05/2023	25/05/2023	24/05/2023	24/05/2023
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	30/05/2023	30/05/2023	30/05/2023	30/05/2023	30/05/2023
Date analysed	-	31/05/2023	31/05/2023	31/05/2023	31/05/2023	31/05/2023
TRH C_{10} - C_{14}	µg/L	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	µg/L	<100	<100	<100	<100	190
TRH C_{29} - C_{36}	µg/L	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	µg/L	<50	<50	<50	<50	190
TRH >C_{10} - C_{16}	µg/L	<50	<50	<50	<50	54
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50	<50	<50	<50	54
TRH >C_{16} - C_{34}	µg/L	<100	<100	<100	<100	160
TRH >C_{34} - C_{40}	µg/L	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	µg/L	<50	<50	<50	<50	220
Surrogate o-Terphenyl	%	61	79	73	74	81

svTRH (C10-C40) in Water				
Our Reference		324180-6	324180-7	324180-9
Your Reference	UNITS	MW117	WDUP1	TB-W1
Date Sampled		23/05/2023	-	23-25/5/23
Type of sample		Water	Water	Water
Date extracted	-	30/05/2023	30/05/2023	30/05/2023
Date analysed	-	31/05/2023	31/05/2023	31/05/2023
TRH C_{10} - C_{14}	µg/L	<50	<50	<50
TRH C_{15} - C_{28}	µg/L	<100	<100	<100
TRH C_{29} - C_{36}	µg/L	<100	<100	<100
Total +ve TRH (C10-C36)	µg/L	<50	<50	<50
TRH >C_{10} - C_{16}	µg/L	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50	<50	<50
TRH >C_{16} - C_{34}	µg/L	<100	<100	<100
TRH >C_{34} - C_{40}	µg/L	<100	<100	<100
Total +ve TRH (>C10-C40)	µg/L	<50	<50	<50
Surrogate o-Terphenyl	%	70	75	74

PAHs in Water						
Our Reference		324180-1	324180-2	324180-3	324180-4	324180-5
Your Reference	UNITS	MW12	MW14	MW15	MW101	MW116
Date Sampled		24/05/2023	25/05/2023	25/05/2023	24/05/2023	24/05/2023
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	30/05/2023	30/05/2023	30/05/2023	30/05/2023	30/05/2023
Date analysed	-	31/05/2023	31/05/2023	31/05/2023	31/05/2023	31/05/2023
Naphthalene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Acenaphthylene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d14	%	65	86	80	86	82

PAHs in Water				
Our Reference		324180-6	324180-7	324180-9
Your Reference	UNITS	MW117	WDUP1	TB-W1
Date Sampled		23/05/2023	-	23-25/5/23
Type of sample		Water	Water	Water
Date extracted	-	30/05/2023	30/05/2023	30/05/2023
Date analysed	-	31/05/2023	31/05/2023	31/05/2023
Naphthalene	µg/L	<0.2	<0.2	<0.2
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	%	76	84	73

HM in water - dissolved						
Our Reference	UNITS	324180-1	324180-2	324180-3	324180-4	324180-5
Your Reference		MW12	MW14	MW15	MW101	MW116
Date Sampled		24/05/2023	25/05/2023	25/05/2023	24/05/2023	24/05/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	30/05/2023	30/05/2023	30/05/2023	30/05/2023	30/05/2023
Date analysed	-	30/05/2023	30/05/2023	30/05/2023	30/05/2023	30/05/2023
Arsenic-Dissolved	μg/L	<1	<1	<1	1	1
Cadmium-Dissolved	μg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium-Dissolved	μg/L	1	<1	<1	2	4
Copper-Dissolved	μg/L	1	<1	<1	<1	<1
Lead-Dissolved	μg/L	<1	<1	<1	<1	<1
Mercury-Dissolved	μg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel-Dissolved	μg/L	<1	<1	2	3	2
Zinc-Dissolved	μg/L	2	7	6	20	26

HM in water - dissolved				
Our Reference	UNITS	324180-6	324180-7	324180-9
Your Reference		MW117	WDUP1	TB-W1
Date Sampled		23/05/2023	-	23-25/5/23
Type of sample		Water	Water	Water
Date prepared	-	30/05/2023	30/05/2023	30/05/2023
Date analysed	-	30/05/2023	30/05/2023	30/05/2023
Arsenic-Dissolved	μg/L	<1	<1	<1
Cadmium-Dissolved	μg/L	<0.1	<0.1	<0.1
Chromium-Dissolved	μg/L	<1	<1	<1
Copper-Dissolved	μg/L	1	<1	<1
Lead-Dissolved	μg/L	<1	<1	<1
Mercury-Dissolved	μg/L	<0.05	<0.05	<0.05
Nickel-Dissolved	μg/L	1	1	<1
Zinc-Dissolved	μg/L	19	18	<1

Miscellaneous Inorganics						
Our Reference		324180-1	324180-2	324180-3	324180-4	324180-5
Your Reference	UNITS	MW12	MW14	MW15	MW101	MW116
Date Sampled		24/05/2023	25/05/2023	25/05/2023	24/05/2023	24/05/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	26/05/2023	26/05/2023	26/05/2023	26/05/2023	26/05/2023
Date analysed	-	26/05/2023	26/05/2023	26/05/2023	26/05/2023	26/05/2023
pH	pH Units	6.7	7.1	6.0	6.6	6.1
Electrical Conductivity	µS/cm	1,100	1,600	360	1,900	220

Miscellaneous Inorganics		
Our Reference		324180-6
Your Reference	UNITS	MW117
Date Sampled		23/05/2023
Type of sample		Water
Date prepared	-	26/05/2023
Date analysed	-	26/05/2023
pH	pH Units	6.1
Electrical Conductivity	µS/cm	230

Method ID	Methodology Summary
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell at 25°C in accordance with APHA latest edition 2510 and Rayment & Lyons.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Metals-022	Determination of various metals by ICP-MS.
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. 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.

QUALITY CONTROL: VOCs in water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			29/05/2023	1	29/05/2023	30/05/2023		29/05/2023	[NT]
Date analysed	-			30/05/2023	1	30/05/2023	30/05/2023		30/05/2023	[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	102	[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	100	[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	105	[NT]
1,1,1-trichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	101	[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	[NT]	[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	95	[NT]
Bromodichloromethane	µg/L	1	Org-023	<1	1	<1	<1	0	95	[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	[NT]	[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	92	[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	97	[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	[NT]	[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	[NT]	[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	[NT]	[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	110	1	119	116	3	103	[NT]
Surrogate toluene-d8	%		Org-023	104	1	114	111	3	102	[NT]
Surrogate 4-BFB	%		Org-023	102	1	104	103	1	102	[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	-			29/05/2023	1	29/05/2023	30/05/2023		29/05/2023	[NT]
Date analysed	-			30/05/2023	1	30/05/2023	30/05/2023		30/05/2023	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	1	<10	<10	0	98	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	1	<10	<10	0	98	[NT]
Benzene	µg/L	1	Org-023	<1	1	<1	<1	0	93	[NT]
Toluene	µg/L	1	Org-023	<1	1	1	1	0	101	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	95	[NT]
m+p-xylene	µg/L	2	Org-023	<2	1	<2	<2	0	101	[NT]
o-xylene	µg/L	1	Org-023	<1	1	<1	<1	0	96	[NT]
Naphthalene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	110	1	119	116	3	103	[NT]
Surrogate toluene-d8	%		Org-023	104	1	114	111	3	102	[NT]
Surrogate 4-BFB	%		Org-023	102	1	104	103	1	102	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			30/05/2023	1	30/05/2023	30/05/2023		30/05/2023	[NT]
Date analysed	-			31/05/2023	1	31/05/2023	31/05/2023		31/05/2023	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	1	<50	<50	0	93	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	1	<100	<100	0	92	[NT]
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	1	<100	<100	0	71	[NT]
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	1	<50	<50	0	93	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	1	<100	<100	0	92	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	1	<100	<100	0	71	[NT]
Surrogate o-Terphenyl	%		Org-020	79	1	61	73	18	70	[NT]

QUALITY CONTROL: PAHs in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	324180-2
Date extracted	-			30/05/2023	1	30/05/2023	30/05/2023		30/05/2023	30/05/2023
Date analysed	-			31/05/2023	1	31/05/2023	31/05/2023		31/05/2023	31/05/2023
Naphthalene	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	79	99
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	76	95
Fluorene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	77	97
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	85	106
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	84	105
Pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	85	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	64	74
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	67	83
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	81	1	65	83	24	83	86

QUALITY CONTROL: HM in water - dissolved					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	324180-2
Date prepared	-			30/05/2023	1	30/05/2023	30/05/2023		30/05/2023	30/05/2023
Date analysed	-			30/05/2023	1	30/05/2023	30/05/2023		30/05/2023	30/05/2023
Arsenic-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	90	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	1	<0.1	<0.1	0	91	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	1	1	1	0	89	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	1	1	1	0	85	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	93	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	1	<0.05	<0.05	0	110	100
Nickel-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	89	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	1	2	2	0	91	[NT]

QUALITY CONTROL: Miscellaneous Inorganics					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			26/05/2023	1	26/05/2023	26/05/2023		26/05/2023	[NT]
Date analysed	-			26/05/2023	1	26/05/2023	26/05/2023		26/05/2023	[NT]
pH	pH Units		Inorg-001	[NT]	1	6.7	6.7	0	100	[NT]
Electrical Conductivity	µS/cm	1	Inorg-002	<1	1	1100	1100	0	98	[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

Samples #1, 4 ,5 and 6 received out holding time for PH and EC.

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	JK Environments
Attention	Katrina Taylor

Sample Login Details	
Your reference	E35521PT
Envirolab Reference	324180
Date Sample Received	26/05/2023
Date Instructions Received	26/05/2023
Date Results Expected to be Reported	02/06/2023

Sample Condition	
Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	10 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	6
Cooling Method	Ice Pack
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:

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 ID	VOCs in water	vTRH(C6-C10)/BTEXN in Water	svTRH (C10-C40) in Water	PAHs in Water	HM in water - dissolved	pH	Electrical Conductivity	On Hold
MW12	✓	✓	✓	✓	✓	✓	✓	
MW14	✓	✓	✓	✓	✓	✓	✓	
MW15	✓	✓	✓	✓	✓	✓	✓	
MW101	✓	✓	✓	✓	✓	✓	✓	
MW116	✓	✓	✓	✓	✓	✓	✓	
MW117	✓	✓	✓	✓	✓			
WDUP1	✓	✓	✓	✓	✓			
WDUP2								✓
TB-W1		✓	✓	✓	✓			
TS-W1		✓						

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.

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD 12 ASHLEY STREET CHATSWOOD NSW 2067 P: (02) 99106200 F: (02) 99106201 Attention: Aileen	JKE Job Number: E35521PT Date Results Required: STANDARD Page: 1 of 1	JKEnvironments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: ktaylor@jkenvironments.com.au

Location: Blayney

Sampler: OB

Sample Preserved In Esky on Ice

Tests Required

Date Sampled	Lab Ref:	Sample Number	Sample Containers	PID	Sample Description	#3L	VOCs (includes BTEX)	EC/pH	#3	BTEX
24/05/2023	1	MW12	##		Water	X	X	X		
25/05/2023	2	MW14	##		Water	X	X	X		
25/05/2023	3	MW15	##		Water	X	X	X		
24/05/2023	4	MW101	##		Water	X	X	X		
24/05/2023	5	MW116	##		Water	X	X	X		
23/05/2023	6	MW117	##		Water	X	X	X		
-	7	WDUP1	##		Water	X	X			
-	8	WDUP2	##		Water	X	X			
23-25/5/23	9	TB-W1	V		Water				X	
23-25/5/23	10	TS-W1	V		Water					X

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200
Job No: 324180
Date Received: 26/05/23
Time Received: 1540
Received By: VC
Temp: Cool/Ambient 6°C
Cooling: Ice/Icepack
Security: Intact/Broken/None

Remarks (comments/detection limits required):

All analysis PQLs to ANZECC (2000) Detection Limits Please

Sample Containers: ## - FOR ALL CONTAINERS
G1 - 250mL Amber Glass Bottle
V - BTEX Vial H - HNO3 Wash PVC
PVC - HDPE Plastic Bottles

Relinquished By: KT	Date: 26.05.23	Time: 1540	Received By: Victoria Chan	Date: 26/05/23.

Envirolab Services Pty Ltd
ABN 37 112 535 645 - 002
25 Research Drive Croydon South VIC 3136
ph 03 9763 2500 fax 03 9763 2633
melbourne@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 37639

Client Details

Client	JK Environments
Attention	Katrina Taylor
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E35521PT**
Number of Samples	1 Water
Date samples received	31/05/2023
Date completed instructions received	31/05/2023

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	06/06/2023
Date of Issue	06/06/2023

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Results Approved By
Tara White, Metals Team Leader
Tianna Milburn, Senior Chemist

Authorised By
Pamela Adams, Laboratory Manager

VOCs in water - Routine Level		
Our Reference		37639-1
Your Reference	UNITS	WDUP2
Date Sampled		24/05/2023
Type of sample		Water
Date extracted	-	02/06/2023
Date analysed	-	02/06/2023
Dichlorodifluoromethane	µg/L	<10
Chloromethane	µg/L	<10
Vinyl Chloride	µg/L	<10
Bromomethane	µg/L	<10
Chloroethane	µg/L	<10
Trichlorofluoromethane	µg/L	<10
1,1-Dichloroethene	µg/L	<1
Trans-1,2-dichloroethene	µg/L	<1
1,1-dichloroethane	µg/L	<1
Cis-1,2-dichloroethene	µg/L	<1
Bromochloromethane	µg/L	<1
Chloroform	µg/L	<1
2,2-dichloropropane	µg/L	<1
1,2-dichloroethane	µg/L	<1
1,1,1-trichloroethane	µg/L	<1
1,1-dichloropropene	µg/L	<1
Cyclohexane	µg/L	<1
Carbon tetrachloride	µg/L	<1
Benzene	µg/L	<1
Dibromomethane	µg/L	<1
1,2-dichloropropane	µg/L	<1
Trichloroethene	µg/L	<1
Bromodichloromethane	µg/L	<1
trans-1,3-dichloropropene	µg/L	<1
cis-1,3-dichloropropene	µg/L	<1
1,1,2-trichloroethane	µg/L	<1
Toluene	µg/L	<1
1,3-dichloropropane	µg/L	<1
Dibromochloromethane	µg/L	<1
1,2-dibromoethane	µg/L	<1
Tetrachloroethene	µg/L	<1
1,1,1,2-tetrachloroethane	µg/L	<1
Chlorobenzene	µg/L	<1
Ethylbenzene	µg/L	<1

VOCs in water - Routine Level		
Our Reference		37639-1
Your Reference	UNITS	WDUP2
Date Sampled		24/05/2023
Type of sample		Water
Bromoform	µg/L	<1
m+p-xylene	µg/L	<2
Styrene	µg/L	<1
1,1,2,2-tetrachloroethane	µg/L	<1
o-xylene	µg/L	<1
1,2,3-trichloropropane	µg/L	<1
Isopropylbenzene	µg/L	<1
Bromobenzene	µg/L	<1
n-propyl benzene	µg/L	<1
2-chlorotoluene	µg/L	<1
4-chlorotoluene	µg/L	<1
1,3,5-trimethyl benzene	µg/L	<1
Tert-butyl benzene	µg/L	<1
1,2,4-trimethyl benzene	µg/L	<1
1,3-dichlorobenzene	µg/L	<1
Sec-butyl benzene	µg/L	<1
1,4-dichlorobenzene	µg/L	<1
4-isopropyl toluene	µg/L	<1
1,2-dichlorobenzene	µg/L	<1
n-butyl benzene	µg/L	<1
1,2-dibromo-3-chloropropane	µg/L	<1
1,2,4-trichlorobenzene	µg/L	<1
Hexachlorobutadiene	µg/L	<1
1,2,3-trichlorobenzene	µg/L	<1
Surrogate Dibromofluoromethane	%	107
Surrogate toluene-d8	%	98
Surrogate 4-BFB	%	95

vTRH(C6-C10)/BTEXN in Water		
Our Reference		37639-1
Your Reference	UNITS	WDUP2
Date Sampled		24/05/2023
Type of sample		Water
Date extracted	-	02/06/2023
Date analysed	-	02/06/2023
TRH C_6 - C_9	µg/L	<10
TRH C_6 - C_{10}	µg/L	<10
TRH C_6 -C_{10} less BTEX (F1)	µg/L	<10
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Naphthalene	µg/L	<1
Total +ve Xylenes	µg/L	<1
Total BTEX in water	µg/L	<1
Surrogate Dibromofluoromethane	%	109
Surrogate toluene-d8	%	98
Surrogate 4-BFB	%	97

TRH Water(C10-C40) NEPM		
Our Reference		37639-1
Your Reference	UNITS	WDUP2
Date Sampled		24/05/2023
Type of sample		Water
Date extracted	-	31/05/2023
Date analysed	-	02/06/2023
TRH C_{10} - C_{14}	µg/L	<50
TRH C_{15} - C_{28}	µg/L	290
TRH C_{29} - C_{36}	µg/L	<100
Total +ve TRH (C10-C36)	µg/L	290
TRH >C_{10} - C_{16}	µg/L	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50
TRH >C_{16} - C_{34}	µg/L	270
TRH >C_{34} - C_{40}	µg/L	<100
Total +ve TRH (>C10-C40)	µg/L	270
Surrogate o-Terphenyl	%	103

PAHs in Water		
Our Reference		37639-1
Your Reference	UNITS	WDUP2
Date Sampled		24/05/2023
Type of sample		Water
Date extracted	-	31/05/2023
Date analysed	-	01/06/2023
Naphthalene	µg/L	<0.1
Acenaphthylene	µg/L	<0.1
Acenaphthene	µg/L	<0.1
Fluorene	µg/L	<0.1
Phenanthrene	µg/L	<0.1
Anthracene	µg/L	<0.1
Fluoranthene	µg/L	<0.1
Pyrene	µg/L	<0.1
Benzo(a)anthracene	µg/L	<0.1
Chrysene	µg/L	<0.1
Benzo(b,j&k)fluoranthene	µg/L	<0.2
Benzo(a)pyrene	µg/L	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1
Total +ve PAH's	µg/L	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5
Surrogate p-Terphenyl-d_{14}	%	106

HM in water - dissolved		
Our Reference		37639-1
Your Reference	UNITS	WDUP2
Date Sampled		24/05/2023
Type of sample		Water
Date prepared	-	02/06/2023
Date analysed	-	02/06/2023
Arsenic-Dissolved	µg/L	1
Cadmium-Dissolved	µg/L	<0.1
Chromium-Dissolved	µg/L	4
Copper-Dissolved	µg/L	<1
Lead-Dissolved	µg/L	<1
Nickel-Dissolved	µg/L	2
Zinc-Dissolved	µg/L	27
Mercury-Dissolved	µg/L	<0.05

Method ID	Methodology Summary
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Metals-022 ICP-MS	Determination of various metals by ICP-MS.
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-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. 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.

QUALITY CONTROL: VOCs in water - Routine Level						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			02/06/2023	[NT]	[NT]	[NT]	[NT]	02/06/2023	[NT]
Date analysed	-			02/06/2023	[NT]	[NT]	[NT]	[NT]	02/06/2023	[NT]
Dichlorodifluoromethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloromethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromomethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroform	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	110	[NT]
2,2-dichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
1,1,1-trichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	109	[NT]
1,1-dichloropropene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Cyclohexane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibromomethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	112	[NT]
Bromodichloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]
1,2-dibromoethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	114	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromoform	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Styrene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

QUALITY CONTROL: VOCs in water - Routine Level					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,3-trichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Isopropylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-propyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3,5-trimethyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Tert-butyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trimethyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Sec-butyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-isopropyl toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-butyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	98	[NT]	[NT]	[NT]	[NT]	102	[NT]
Surrogate toluene-d8	%		Org-023	99	[NT]	[NT]	[NT]	[NT]	99	[NT]
Surrogate 4-BFB	%		Org-023	96	[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-1	[NT]
Date extracted	-			02/06/2023	[NT]	[NT]	[NT]	[NT]	02/06/2023	[NT]
Date analysed	-			02/06/2023	[NT]	[NT]	[NT]	[NT]	02/06/2023	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	108	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	108	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	109	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]
Naphthalene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Surrogate Dibromofluoromethane	%		Org-023	100	[NT]	[NT]	[NT]	[NT]	104	[NT]
Surrogate toluene-d8	%		Org-023	99	[NT]	[NT]	[NT]	[NT]	98	[NT]
Surrogate 4-BFB	%		Org-023	98	[NT]	[NT]	[NT]	[NT]	99	[NT]

QUALITY CONTROL: TRH Water(C10-C40) NEPM					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			31/05/2023	[NT]	[NT]	[NT]	[NT]	31/05/2023	[NT]
Date analysed	-			02/06/2023	[NT]	[NT]	[NT]	[NT]	02/06/2023	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	93	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	121	[NT]
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	133	[NT]
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	93	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	121	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	133	[NT]
Surrogate o-Terphenyl	%		Org-020	80	[NT]	[NT]	[NT]	[NT]	79	[NT]

QUALITY CONTROL: PAHs in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			31/05/2023	[NT]	[NT]	[NT]	[NT]	31/05/2023	[NT]
Date analysed	-			01/06/2023	[NT]	[NT]	[NT]	[NT]	01/06/2023	[NT]
Naphthalene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	91	[NT]
Acenaphthylene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Fluorene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	114	[NT]
Anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	113	[NT]
Benzo(a)anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Benzo(b,j&k)fluoranthene	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	112	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d_{14}	%		Org-022/025	95	[NT]	[NT]	[NT]	[NT]	99	[NT]

QUALITY CONTROL: HM in water - dissolved					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			02/06/2023	1	02/06/2023	02/06/2023		02/06/2023	[NT]
Date analysed	-			02/06/2023	1	02/06/2023	02/06/2023		02/06/2023	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	1	1	1	0	104	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022 ICP-MS	<0.1	1	<0.1	<0.1	0	103	[NT]
Chromium-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	1	4	4	0	103	[NT]
Copper-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	1	<1	<1	0	101	[NT]
Lead-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	1	<1	<1	0	102	[NT]
Nickel-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	1	2	2	0	103	[NT]
Zinc-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	1	27	27	0	103	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021 CV-AAS	<0.05	1	<0.05	<0.05	0	104	[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.

Envirolab Services Pty Ltd
ABN 37 112 535 645 - 002
25 Research Drive Croydon South VIC 3136
ph 03 9763 2500 fax 03 9763 2633
melbourne@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details	
Client	JK Environments
Attention	Katrina Taylor

Sample Login Details	
Your reference	E35521PT
Envirolab Reference	37639
Date Sample Received	31/05/2023
Date Instructions Received	31/05/2023
Date Results Expected to be Reported	06/06/2023

Sample Condition	
Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	1 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	12.3
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments
Nil

Please direct any queries to:

Pamela Adams	Chris De Luca
Phone: 03 9763 2500	**Phone: 03 9763 2500**
Fax: 03 9763 2633	**Fax: 03 9763 2633**
Email: padams@envirolab.com.au	**Email: cdeluca@envirolab.com.au**

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
ABN 37 112 535 645 - 002
25 Research Drive Croydon South VIC 3136
ph 03 9763 2500 fax 03 9763 2633
melbourne@envirolab.com.au
www.envirolab.com.au

Sample ID	VOCs in water - Routine Level	vTRH(C6-C10)/BTEXN in Water	TRH Water(C10-C40) NEPM	PAHs in Water	HM in water - dissolved
WDUP2	✓	✓	✓	✓	✓

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.

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD 12 ASHLEY STREET CHATSWOOD NSW 2067 P: (02) 99106200 F: (02) 99106201 Attention: Aileen	JKE Job Number: E35521PT Date Results Required: STANDARD Page: 1 of 1	JKEnvironments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: ktaylor@jkenvironments.com.au

Location: Blayney

Sampler: OB

Sample Preserved in Esky on Ice

Tests Required

Date Sampled	Lab Ref:	Sample Number	Sample Containers	PID	Sample Description	#3L	VOCs (includes BTEX)	EC/pH	#3	BTEX
24/05/2023	1	MW12	##		Water	X	X	X		
25/05/2023	2	MW14	##		Water	X	X	X		
25/05/2023	3	MW15	##		Water	X	X	X		
24/05/2023	4	MW101	##		Water	X	X	X		
24/05/2023	5	MW116	##		Water	X	X	X		
23/05/2023	6	MW117	##		Water	X	X	X		
-	7	WDUP1	##		Water	X	X			
-	8	WDUP2	##		Water	X	X			
23-25/5/23	9	TB-W1	V		Water				X	
23-25/5/23	10	TS-W1	V		Water					X

(1)

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200
Job No: 324180
Date Received: 26/05/23
Time Received: 1540
Received By: VC
Temp: Cool/Ambient 6°C
Cooling: Ice/Icepack
Security: Intact/Broken/None

Remarks (comments/detection limits required):

All analysis PQLs to ANZECC (2000) Detection Limits Please

Sample Containers: ## - FOR ALL CONTAINERS
G1 - 250mL Amber Glass Bottle
V - BTEX Vial H - HNO3 Wash PVC
PVC - HDPE Plastic Bottles

Relinquished By: KT	Date: 26.05.23	Time: 1540	Received By: Victoria Chan	Date: 26/05/23.

Envirolab Services
25 Research Drive
Croydon South VIC 3136
Ph: (03) 9763 2500
Job No: 37639
Date Received: 31/5/23
Time Received: 12:45
Received by: AP
Temp: Cool/Ambient 12.3
Cooling: Ice/Icepack
Security: Intact/Broken/None

Relinquished by: ELS Syd
Sarah P
30/05/23, 1150
Sarah

Appendix E: Report Explanatory Notes

QA/QC Definitions

The QA/QC terms used in this report are defined below. The definitions are in accordance with US EPA publication SW-846, entitled *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (1994)[16] methods and those described in *Environmental Sampling and Analysis, A Practical Guide,* (1991)[17]. The NEPM (2013) is consistent with these documents.

A. <u>Practical Quantitation Limit (PQL), Limit of Reporting (LOR) & Estimated Quantitation Limit (EQL)</u>

These terms all refer to the concentration above which results can be expressed with a minimum 95% confidence level. The laboratory reporting limits are generally set at ten times the standard deviation for the Method Detection Limit for each specific analyte. For the purposes of this report the LOR, PQL, and EQL are considered to be equivalent.

When assessing laboratory data it should be borne in mind that values at or near the PQL have two important limitations: *"The uncertainty of the measurement value can approach, and even equal, the reported value. Secondly, confirmation of the analytes reported is virtually impossible unless identification uses highly selective methods. These issues diminish when reliably measurable amounts of analytes are present. Accordingly, legal and regulatory actions should be limited to data at or above the reliable detection limit*" (Keith, 1991).

B. <u>Precision</u>

The degree to which data generated from repeated measurements differ from one another due to random errors. Precision is measured using the standard deviation or Relative Percent Difference (RPD).

C. <u>Accuracy</u>

Accuracy is a measure of the agreement between an experimental result and the true value of the parameter being measured (i.e. the proximity of an averaged result to the true value, where all random errors have been statistically removed). The assessment of accuracy for an analysis can be achieved through the analysis of known reference materials or assessed by the analysis of surrogates, field blanks, trip spikes and matrix spikes. Accuracy is typically reported as percent recovery.

D. <u>Representativeness</u>

Representativeness expresses the degree to which sample data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness is primarily dependent upon the design and implementation of the sampling program. Representativeness of the data is partially ensured by the avoidance of contamination, adherence to sample handing and analysis protocols and use of proper chain-of-custody and documentation procedures.

E. <u>Completeness</u>

Completeness is a measure of the number of valid measurements in a data set compared to the total number of measurements made and overall performance against DQIs. The following information is assessed for completeness:

- Chain-of-custody forms;
- Sample receipt form;
- All sample results reported;
- All blank data reported;

[16] US EPA, (1994). *SW-846: Test Methods for Evaluating Solid Waste, Physical/Chemical Methods.* (US EPA SW-846)
[17] Keith., H, (1991). *Environmental Sampling and Analysis, A Practical Guide*

- All laboratory duplicate and RPDs calculated;
- All surrogate spike data reported;
- All matrix spike and lab control spike (LCS) data reported and RPDs calculated;
- Spike recovery acceptable limits reported; and
- NATA stamp on reports.

F. Comparability

Comparability is the evaluation of the similarity of conditions (e.g. sample depth, sample homogeneity) under which separate sets of data are produced. Data comparability checks include a bias assessment that may arise from the following sources:

- Collection and analysis of samples by different personnel; Use of different techniques;
- Collection and analysis by the same personnel using the same methods but at different times; and
- Spatial and temporal changes (due to environmental dynamics).

G. Blanks

The purpose of laboratory and field blanks is to check for artefacts and interferences that may arise during sampling, transport and analysis.

H. Matrix Spikes

Samples are spiked with laboratory grade standards to detect interactive effects between the sample matrix and the analytes being measured. Matrix Spikes are reported as a percent recovery and are prepared for 1 in every 20 samples. Sample batches that contain less than 20 samples may be reported with a Matrix Spike from another batch. The percent recovery is calculated using the formula below. Acceptable recovery limits are 70% to 130%.

$$\frac{(\text{Spike Sample Result} - \text{Sample Result}) \times 100}{\text{Concentration of Spike Added}}$$

I. Surrogate Spikes

Samples are spiked with a known concentration of compounds that are chemically related to the analyte being investigated but unlikely to be detected in the environment. The purpose of the Surrogate Spikes is to check the accuracy of the analytical technique. Surrogate Spikes are reported as percent recovery.

J. Duplicates

Laboratory duplicates measure precision, expressed as Relative Percent Difference. Duplicates are prepared from a single field sample and analysed as two separate extraction procedures in the laboratory. The RPD is calculated using the formula where D1 is the sample concentration and D2 is the duplicate sample concentration:

$$\frac{(D1 - D2) \times 100}{\{(D1 + D2)/2\}}$$

Appendix F: Data (QA/QC) Evaluation

Data (QA/QC) Evaluation

A. INTRODUCTION

This Data (QA/QC) Evaluation forms part of the validation process for the DQOs documented in the SAQP in the appendices of this report. Checks were made to assess the data in terms of precision, accuracy, representativeness, comparability and completeness. These 'PARCC' parameters are referred to collectively as DQIs and are defined in the Report Explanatory Notes attached in the report appendices.

1. Field and Laboratory Considerations

The quality of the analytical data produced for this project has been considered in relation to the following:

- Sample collection, storage, transport and analysis;
- Laboratory PQLs;
- Field QA/QC results; and
- Laboratory QA/QC results.

2. Field QA/QC Samples and Analysis

The results for the field QA/QC samples are detailed in the laboratory summary tables (Table Q1 to Table Q3 inclusive) attached to the investigation report and are discussed in the subsequent sections of this Data (QA/QC) Evaluation report. A summary of the field QA/QC samples collected and analysed for this investigation is provided in the following table:

Sample Type	Number Analysed	Frequency (of Sample Type)
Intra-laboratory duplicate (soil)	3	Approximately 15% of primary samples
Inter-laboratory duplicate (soil)	3	As above
Intra-laboratory duplicate (groundwater)	1	Approximately 33% of primary samples
Inter-laboratory duplicate (groundwater)	1	As above
Trip spike - Soil Water	 1 1	One of each matrix for the investigation to demonstrate adequacy of preservation, storage and transport methods
Trip blank - Soil Water	 1 1	One of each matrix for the investigation to demonstrate adequacy of preservation, storage and transport methods
Rinsate - SPT Auger (excavator)	 1 1	One for the SPT and one for the excavator auger for the investigation to demonstrate adequacy of decontamination methods
Shroud Leak Test Vapour	1	One for the investigation to demonstrate adequacy of decontamination methods

3. Data Assessment Criteria

JKE adopted the following criteria for assessing the field and laboratory QA/QC analytical results:

Field Duplicates

Acceptable targets for precision of field duplicates in this report will be 30% or less, consistent with NEPM (2013). RPD failures will be considered qualitatively on a case-by-case basis taking into account factors such as the concentrations used to calculate the RPD (i.e. RPD exceedance where concentrations are close to the PQL are typically not as significant as those where concentrations are reported at least five or 10 times the PQL), sample type, collection methods and the specific analyte where the RPD exceedance was reported.

Field/Trip Blanks and Rinsates

Acceptable targets for field blank and rinsate samples in this report will be less than the PQL for organic analytes. Metals will be considered on a case-by-case basis with regards to typical background concentrations in soils and published drinking water guidelines for waters.

Trip Spikes

Acceptable targets for trip spike samples in this report will be 70% to 130%.

Isopropanol Shroud

The isopropanol shroud sample is used for leak test purposes. The shroud sample intends to demonstrate a high isopropanol concentration, then the soil vapour samples ideally should not detect high concentrations of isopropanol. A significant (>10mg/m^3 or >10,000µg/m^3) detection of isopropanol in the soil vapour samples may indicate a leak in the installation and suggest that ambient air is being drawn into the installation during sampling.

Laboratory QA/QC

The suitability of the laboratory data is assessed against the laboratory QA/QC criteria which is outlined in the laboratory reports. These criteria were developed and implemented in accordance with the laboratory's NATA accreditation and align with the acceptable limits for QA/QC samples as outlined in NEPM (2013) and other relevant guidelines.

A summary of the acceptable limits adopted by the primary laboratory (Envirolab) is provided below:

RPDs

- Results that are <5 times the PQL, any RPD is acceptable; and
- Results >5 times the PQL, RPDs between 0-50% are acceptable.

Laboratory Control Samples (LCS) and Matrix Spikes

- 70-130% recovery acceptable for metals and inorganics;
- 60-140% recovery acceptable for organics; and
- 10-140% recovery acceptable for VOCs.

Surrogate Spikes

- 60-140% recovery acceptable for general organics; and

- 10-140% recovery acceptable for VOCs.

Method Blanks

- All results less than PQL.

B. <u>DATA EVALUATION</u>

1. <u>Sample Collection, Storage, Transport and Analysis</u>

Samples were collected by trained field staff in accordance with our standard sampling procedures. Field sampling procedures were designed to be consistent with relevant guidelines, including NEPM (2013) and other guidelines made under the CLM Act 1997.

Appropriate sample preservation, handling and storage procedures were adopted. With the exception of pH and electrical conductivity (EC) analysis of one soil sample (Envirolab report 323727-A) and the water samples (Envirolab report 324180), laboratory analysis was undertaken within specified holding times generally in accordance with Schedule B(3) of NEPM (2013) and the laboratory NATA accredited methodologies. It is noted that the groundwater pH and EC analysis was undertaken two days out of holding time and the soil pH analysis was undertaken one day out of holding time. All samples were preserved either on ice when in the field or in fridges at the JKE office or laboratory prior to analysis. On this basis, the impacts to precision and accuracy are not considered to be significant and do not impact the report conclusions.

Envirolab noted that the asbestos results were reported to be consistent with the recommendations in NEPM (2013), however this level of reporting is outside the scope of their NATA accreditation. In the absence of other available analytical methods for asbestos, this was found to be acceptable for the purpose of this investigation.

JKE note that the temperature on receipt of soil samples was reported to be up to 15°C. JKE understand that the temperature is measured at the laboratory using an infrared temperature probe by scanning the outside of the sample container (i.e. one sample jar/container at the time of registering the samples). This procedure is not considered to be robust as there is a potential for the outside of the jar to warm to ambient temperature, or at least to increase from that of the internal contents, relatively quickly. On this basis, JKE is of the opinion that the temperatures reported on the Sample Receipts are unlikely to be reliable or representative of the overall batch. This is further supported by the trip spike recovery results (discussed further below) which reported adequate recovery in the range of 99% to 100%.

Review of the project data also indicated that:

- COC documentation was adequately maintained;
- Sample receipt advice documentation was provided for all sample batches;
- All analytical results were reported; and
- Consistent units were used to report the analysis results.

2. <u>Laboratory PQLs</u>

Appropriate PQLs were adopted for the analysis and all PQLs were below the SAC, with the exception of the anthracene PQL for groundwater analysis which was 10 times greater than the ecological SAC, vinyl chloride, hexachlorobutadiene and benzo(a)pyrene which were all greater than the health based SAC for groundwater (relating to the ADWG and HSL-SSA SAC). In light of the PAH and VOC concentrations reported for soil and groundwater, JKE is of the opinion that this is not significant, and it does not affect the quality of the dataset as a whole or the outcome of the investigation.

3. Field QA/QC Sample Results

Field Duplicates

The results indicated that field precision was acceptable. RPD non-conformances were reported for some analytes as discussed below:

- An elevated RPD was reported for nickel in SDUP1/BH103 (0-0.2m);
- Elevated RPDs were reported for arsenic, chromium, copper, lead, nickel and zinc in SDUP101/BH116 (0.015-0.45m);
- Elevated RPDs were reported for arsenic, lead and mercury in SDUP103/BH101 (0-0.1m);
- Elevated RPDs were reported for TRH F2, TRH F3 and zinc, in SDUP2/BH102 (0-0.2m);
- Elevated RPDs were reported for arsenic, chromium, copper, lead, nickel and zinc in SDUP102/BH116 (4.5-4.95m);
- Elevated RPDs were reported for copper, nickel and zinc in SDUP104/BH122 (0.03-0.4m);
- Elevated RPDs were reported for m,p-xylene, o-xylene, and several VOCs in SVDUP1/SV1;
- An elevated RPD was reported for copper in WDUP1/MW117; and
- Elevated RPDs were reported for TRH F2 and TRH F3 in WDUP2/MW116.

For the investigation the primary and duplicate values have been assessed against the SAC. A majority of the primary and duplicate sample results were less than the SAC. Elevations above the SAC have been addressed in the report and considered in the Tier 1 risk assessment and in drawing conclusions. Therefore, the exceedances are not considered to have had an adverse impact on the data set as a whole. The RPD exceedances are considered to be attributed to results close to the PQLs, or minor sample heterogeneity. Overall, the results are acceptable.

Field/Trip Blanks

During the investigation, one soil trip blank and one water trip blank was placed in the esky during sampling and transported back to the laboratory. The results were all less than the PQLs, therefore cross contamination between samples that may have significance for data validity did not occur.

Rinsates

During the investigation one field rinsate was undertaken on the excavator auger and one on the drill rig SPT. The detectable concentration of light fraction TRH in the excavator auger rinsate is most likely attributed to trihalomethanes. These compounds are breakdown products from the chlorination process and are common in potable water at the concentration reported (the Australian drinking water guideline for total trihalomethanes is 250µg/L).

Low level metals concentrations (i.e. copper) are typical in potable water which is utilised as blank material. Considering the soil analysis results obtained during the investigation, there is considered to be a low potential for cross contamination to have occurred to an extent that may have significance for data validity.

Trip Spikes
The soil trip spike results ranged from 99% to 100% and indicated that field preservation methods were appropriate.

The water trip spike results ranged from 99% to 128% and indicated that field preservation methods were appropriate.

Soil Vapour Installations (Leak Tests)
The isopropanol shroud sample (carbon tube) reported a concentration of 260mg/m^3. The isopropanol result in the corresponding soil vapour sample SV1 was 0.01mg/m^3 (10µg/m^3). The results were below the criterion of 10mg/m^3. The isopropanol result in the SV2 sample was also well below the 10mg/m^3 threshold. This demonstrated the leak test was successful.

4. Laboratory QA/QC

The analytical methods implemented by the laboratory were performed in accordance with their NATA accreditation and were consistent with Schedule B(3) of NEPM (2013). The frequency of data reported for the laboratory QA/QC (i.e. duplicates, spikes, blanks, LCS) was considered to be acceptable for the purpose of this investigation. A review of the laboratory QA/QC data identified the following minor non-conformances:

Envirolab report 323727-A

- Percent recovery for CEC was not applicable due to the high concentration of the element/s in the sample/s. However, an acceptable recovery was obtained for the LCS.

Envirolab report 323727-B

- The laboratory RPD acceptance criteria was exceeded for one sample for chromium and lead. Therefore a triplicate result was issued.

Envirolab report 324816

- Percent recovery for metals in soil was not possible to report due to the inhomogeneous nature of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.

Overall, the quality of the laboratory data was considered to be acceptable. The laboratory QA/QC data did suggest that there was some heterogeneity in the fill samples, however, we do not consider that this has altered the outcome of the Tier 1 risk assessment or recommendations.

C. DATA QUALITY SUMMARY

JKE is of the opinion that the data are adequately precise, accurate, representative, comparable and complete to serve as a basis for interpretation to achieve the investigation objectives.

Non-conformances were reported for some field QA/QC samples and laboratory QA/QC analysis. These non-conformances were considered to be sporadic and minor, and were not considered to be indicative of systematic sampling or analytical errors. On this basis, these non-conformances are not considered to materially impact the report findings.

There was only one soil vapour monitoring event undertaken for the investigation. On this basis there is some uncertainty around the representativeness of the soil vapour data, particularly during different climatic conditions and after wet/dry periods. This has been considered in drawing conclusions and making recommendations.

Appendix G: Field Work Documents

JKE SAQP

REPORT TO

NSW HEALTH INFRASTRUCTURE

ON

SAMPLING, ANALYSIS AND QUALITY PLAN (SAQP)

FOR

DETAILED SITE INVESTIGATION (DSI)

AT

BLAYNEY DISTRICT HOSPITAL, 3 OSMAN STREET, BLAYNEY, NSW

Date: 10 May 2023

Ref: E35521PT-SAQP

JKEnvironments

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For and on behalf of
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DOCUMENT REVISION RECORD

Report Reference	Report Status	Report Date
E35521PT-SAQP	Final Report	10 May 2023

This Report (which includes all attachments and annexures) has been prepared by JKE for the Client, and is intended for the use only by that Client.

This Report has been prepared pursuant to a contract between JKE and the Client and is therefore subject to:

a) JKE's proposal in respect of the work covered by the Report;
b) The limitations defined in the client's brief to JKE; and
c) The terms of contract between JKE and the Client, including terms limiting the liability of JKE.

If the Client, or any person, provides a copy of this Report to any third party, such third party must not rely on this Report, except with the express written consent of JKE which, if given, will be deemed to be upon the same terms, conditions, restrictions and limitations as apply by virtue of (a), (b), and (c) above.

Any third party who seeks to rely on this Report without the express written consent of JKE does so entirely at their own risk and to the fullest extent permitted by law, JKE accepts no liability whatsoever, in respect of any loss or damage suffered by any such third party.

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Abbreviations

Asbestos Fines/Fibrous Asbestos	**AF/FA**
Ambient Background Concentrations	**ABC**
Added Contaminant Limits	**ACL**
Asbestos Containing Material	**ACM**
Australian Drinking Water Guidelines	**ADWG**
Area of Environmental Concern	**AEC**
Australian Height Datum	**AHD**
Acid Sulfate Soil	**ASS**
Above-ground Storage Tank	**AST**
Below Ground Level	**BGL**
Benzo(a)pyrene Toxicity Equivalent Factor	**BaP TEQ**
Benzene, Toluene, Ethylbenzene, Xylene	**BTEX**
Cation Exchange Capacity	**CEC**
Contaminated Land Management	**CLM**
Contaminant(s) of Potential Concern	**CoPC**
Chain of Custody	**COC**
Conceptual Site Model	**CSM**
Detailed Site Investigation	**DSI**
Ecological Investigation Level	**EIL**
Ecological Screening Level	**ESL**
Environment Protection Authority	**EPA**
Ecological Screening Level	**ESL**
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Health Screening Level	**HSLs**
JK Environments	**JKE**
Map Grid of Australia	**MGA**
National Association of Testing Authorities	**NATA**
National Environmental Protection Measure	**NEPM**
Organochlorine Pesticides	**OCP**
Organophosphate Pesticides	**OPP**
Polycyclic Aromatic Hydrocarbons	**PAH**
Polychlorinated Biphenyls	**PCBs**
Photo-ionisation Detector	**PID**
Protection of the Environment Operations	**POEO**
Practical Quantitation Limit	**PQL**
Remediation Action Plan	**RAP**
Sampling, Analysis and Quality Plan	**SAQP**
State Environmental Planning Policy	**SEPP**
Site Specific Assessment	**SSA**
Source, Pathway, Receptor	**SPR**
Standard Sampling Procedure	**SSP**
Standing Water Level	**SWL**
Total Recoverable Hydrocarbons	**TRH**
United States Environmental Protection Agency	**USEPA**
Underground Storage Tank	**UST**
Volatile Organic Compounds	**VOC**
World Health Organisation	**WHO**
Work Health and Safety	**WHS**

Units

Litres	**L**
Metres BGL	**mBGL**
Metres	**m**

Millivolts	**mV**
Millilitres	**ml or mL**
Milliequivalents	**meq**
micro Siemens per Centimetre	**µS/cm**
Micrograms per Litre	**µg/L**

1 INTRODUCTION

NSW Health Infrastructure ('the client') commissioned JK Environments (JKE) to prepare a Sampling, Analysis and Quality Plan (SAQP) for the Detailed Site Investigation (DSI) to be undertaken for the MPS Stage 5 development at Blayney District Hospital, 3 Osman Street, Blayney, NSW ('the site'). The site location is shown on Figure 1 and the SAQP applies to the site area as shown on Figure 2 attached in the appendices.

JKE has previously undertaken several phases of investigation at the site. A summary of relevant information from these investigations is included in Section 2.

1.1 Proposed Development Details

The proposed development is in the early planning stages and no proposed development plans/drawings have been provided. Based on the limited information provided, we understand that the proposed development would likely be constructed on grade, with minimal excavations for services trenches.

1.2 Aim and Objectives

The primary aim of the DSI is to characterise the soil, soil vapour and groundwater contamination conditions in accessible areas in order to assess site risks in relation to contamination and establish whether remediation is required. A secondary aim is to provide preliminary waste classification data for off-site disposal of soil waste which may be generated during the proposed development works.

The DSI objectives are to:

- Assess the soil, soil vapour and groundwater contamination conditions in accessible areas;
- Assess the potential risks posed by contamination to the receptors identified in the Conceptual Site Model (CSM);
- Provide a preliminary waste classification for the in-situ soil; and
- Inform the preparation of a Remediation Action Plan (RAP).

1.3 Scope of Work

The SAQP was prepared generally in accordance with a JKE proposal (Ref: EP57148PT-Variation1) of 24 March 2023 and written acceptance from The APP Group acting on behalf of the client of 28 April 2023.

The scope of work included review of the previous reports and preparation of an SAQP with regards to the National Environmental Protection (Assessment of Site Contamination) Measure 1999 as amended (2013)[1] and other guidelines made under or with regards to the Contaminated Land Management Act (1997)[2]. A list of reference documents/guidelines is included in the appendices.

[1] National Environment Protection Council (NEPC), (2013). *National Environmental Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013).* (referred to as NEPM 2013)

[2] Contaminated Land Management Act 1997 (NSW) (referred to as CLM Act 1997)

2 SITE INFORMATION

2.1 Previous JKE Investigations

JKE has undertaken several phases of investigation at the site, relevant information is summarised in the table below:

Table 2-1: Summary of Previous Investigations and Relevant Findings

Investigation phase	Relevant findings to the site
Desktop, JKE 2022a[3]	JKE undertook a Desktop in November 2022. The Desktop included a review of site information, including background and site history information from various sources, and a site walkover inspection. During the site inspection, a NSW Health representative (Brian Harvey) from the hospital indicated that a 500L diesel underground storage tank (UST) was located beneath the lawn between the maintenance building and the main carpark at the front of the hospital (refer to Figure 2). The UST was indicated to have been decommissioned circa 1999. The NSW Ambulance Station located to the west of the site was also inspected during the site walkover. A representative from NSW Ambulance indicated that a diesel UST and associate bowser had previously been located on the premises and were remediated/removed circa 2010 (refer to Figure 2). Based on the information reviewed and the site inspection, JKE identified the following potential contamination sources/areas of environmental concern (AEC): fill material – unknown origin; fuel storage onsite – abandoned diesel UST and above-ground storage tank (AST); use of pesticides – around site and beneath buildings/structures; hazardous building materials – former and existing buildings and structures; naturally occurring asbestos – mapped within the regional geological formation; and off-site land uses (upgradient ambulance station with a former UST, and a motor mechanic). Considering the findings and based on a qualitative assessment of various lines of evidence, JKE was of the opinion that there is a potential for site contamination. Based on the potential contamination sources/AEC identified, and the potential for contamination, further investigation of the contamination conditions was considered to be required. The following was recommended to better assess the risks associated with potential contamination at the site: • A preliminary intrusive investigation should be undertaken as a first step to make an initial assessment of the soil and groundwater contamination conditions and better inform the scope of the DSI; • Following the preliminary intrusive investigation, a SAQP should be prepared for the DSI; • A DSI should be undertaken to characterise the site contamination conditions and establish whether the site is suitable for the proposed development, or whether remediation is required; and • A hazardous building materials survey should be undertaken prior to demolition of the buildings. Following demolition of the buildings (and preferably prior to removal of the hardstand), an asbestos clearance certificate should be obtained.

[3] JK Environments, (2022a). *Report to Health Infrastructure on Desktop Preliminary (Stage 1) Site Investigation for Proposed MPS Stage 5 Development at 3 Osman Street, Blayney, NSW.* (Ref: E35521PTrpt, dated 30 November 2022) (referred to as Desktop)

Investigation phase	Relevant findings to the site
PSI, JKE 2022b[4]	To address the first recommendation of the Desktop, an intrusive Preliminary Site Investigation (PSI) was undertaken. The PSI included a review of existing project information, a site inspection, soil sampling from 10 boreholes and groundwater sampling from three monitoring wells installed at the site. The boreholes encountered fill materials to depths of approximately 0.3m below ground level (BGL) to 1.2mBGL, underlain by silty or clayey residual soils. The fill contained inclusions of brick and tile fragments, igneous, ironstone and sandstone gravel, clay nodules, slag, ash, coal and root fibres. There was no fibre cement fragments (FCF)/asbestos containing material (ACM) identified in any of the bulk asbestos quantification field screening samples. A selection of soil and groundwater samples were analysed for the contaminants of potential concern (CoPC). Chromium and asbestos (as asbestos fines [AF]/fibrous asbestos [FA]) were identified in fill/soil at concentrations that exceeded the health based site assessment criteria (SAC). In groundwater, total recoverable hydrocarbons (TRH) F2 was reported above the health based SAC and zinc was reported above the ecological SAC. Asbestos was not identified in the natural soil samples analysed for the PSI. Rock was not encountered to the maximum depth of investigation, 6.45mBGL, during the PSI. The PSI did not identified contamination that would preclude the proposed development/use of the site. However, the report indicated that a DSI is required to facilitate development of a RAP and remediation will be required to render the site suitable for the proposed development. We recommended the following: 1. Prepare a SAQP for the DSI; 2. Undertake a DSI in accordance with the SAQP; and 3. Develop and implement a RAP based on the combined findings of the PSI and DSI. Any requirements documented in a RAP are to be implemented and the site is to be remediated and validated.

2.2 Site Identification

Table 2-2: Site Identification

Current Site Owner (certificate of title):	Health Administration Board
Site Address:	3 Osman Street, Blayney, NSW
Lot & Deposited Plan:	Lot 2 in DP1097082
Current Land Use:	Hospital
Proposed Land Use:	Continued use as a hospital
Local Government Authority (LGA):	Blayney Shire Council
Current Zoning:	R1: General Residential

[4] JK Environments, (2022b). *Report to Health Infrastructure on Preliminary (Stage 1) Site Investigation for Proposed MPS Stage 5 Development at 3 Osman Street, Blayney, NSW.* (Ref: E35521PTrpt2, dated 23 December 2022) (referred to as PSI)

Site Area (a) (approx.):	1.37Ha
RL (AHD in m) (approx.):	870-880
Geographical Location (decimal degrees) (approx. centre of site):	Latitude: -33.5378491 Longitude: 149.250869

2.3 Site Description

The site is located in a predominantly residential area of Blayney and is bound by Martha Street to the south (the Mid Western Highway) and Osman Street to the east. The site is located approximately 445m to the south-west of a tributary of the Belubula River.

The regional topography is characterised by a north-east facing hillside that falls towards the Belubula River. The site is located mid-slope and has a gentle fall towards the north-east at approximately 1°-3°. Parts of the site appear to have been levelled to account for the slope and accommodate the existing development.

The most recent site walkover was undertaken by JKE as part of the PSI on 24 October 2022. Key observations are summarised below:

- The site was occupied by Blayney District Hospital. The main hospital building was positioned in the centre of the site, car parks were located to the east (patient/general public) and to the west (staff) of the main building, and an access road ran along the south of the site;
- The main hospital building was separated into five adjoining buildings comprising the emergency department, hospital wards, offices and clinical, day-care centre, and the maintenance building. A separate aged care home was located to the north, and several carports (including a flammable liquids store) were located to the west. All buildings and structures were single storey, and of an age indicative of potentially housing hazardous building materials (i.e. asbestos and lead paint);
- The car parks and access road/driveway were all asphaltic concrete paved and numerous concrete paved pathways were located around the buildings;
- No evidence of erosion/soil instability was observed during the site inspection;
- A disused diesel 500L AST was observed in the maintenance building adjacent to the former back-up generator (refer to Figure 2). A small amount of staining was observed on the surrounding concrete slab ground surface during the inspection;
- A small quantity of petrol fuel (approximately 5-10L) was observed to be stored in the rear carport flammable liquids store. This fuel was indicated to be used for the onsite mower. No odours or staining were observed on the surrounding ground surfaces during the inspection and this type of fuel storage was not considered to be a potential source of contamination considering the very small quantities involved;
- General waste storage (locked skip bins) identified at rear of the main hospital building (west). No other drums, chemical or waste storage was observed on the site during the inspection;
- Fill material (igneous gravels, brick and concrete fragments, etc.) were observed at the site surface in unpaved areas and generally along the southern batter and beneath the newer emergency department

building, indicating that some filling had likely occurred at the site for the current development and levelling purposes;

- A grease trap was observed at the rear of the main hospital building (refer to Figure 2);
- Surface water flows would be expected to flow to the north-east in keeping with the localised fall of the site. It is noted that several surface drains were observed in the paved sections of the site and these would be expected to drain into the regional stormwater systems; and
- Outside of paved or gravel covered areas the site was generally grass covered, with a number of medium to large trees along the southern, eastern and northern boundaries and within garden areas. No obvious signs of plant stress or dieback were observed.

2.4 Surrounding Land Use

During the site inspection, JKE observed the following land uses in the immediate surrounds:

- North – Residential properties including a hostel;
- South – Martha Street and residential properties beyond;
- East – Osman Street and residential properties beyond; and
- West – NSW Ambulance station including a former diesel UST, residential and commercial properties (including a mechanic - Blayney Pit Stop Autos).

JKE is of the opinion that the adjacent and upgradient NSW Ambulance Station to the west of the site is a potential off-site contamination source due to the (former) presence of at least one UST. The upgradient mechanic may also be an off-site source of contamination. However, we note that the limited groundwater sampling for the PSI did not identify unacceptable groundwater impacts in the western area of the site.

2.5 Underground Services

The 'Before You Dig Australia' (BYDA) plans were reviewed for the investigation in order to establish whether any major underground services exist at the site or in the immediate vicinity that could act as a preferential pathway for contamination migration. Major services were not identified that would be expected to act as preferential pathways for contamination migration.

2.6 Summary of Site History Information

A time line summary of the historical land uses and activities is presented in the table below. The information presented in the table is based on a weight of evidence assessment of the site history documentation and observations made by JKE during the Desktop.

Table 2-3: Summary of Historical Land Uses/Activities

Year(s)	Potential Land Use/Activities
1886-1974	On-site: • Land dedicated for hospital use; • Development of the site for the original hospital; • Some filling of the site likely occurred for levelling purposes and around services; • Use of pesticides beneath buildings and around site; and • Hazardous building materials (i.e. asbestos and lead in paint) may have been used in original structures. Surrounding Area: • Vacant and residential land uses.
1974-2003	On-site: • Ongoing redevelopment of the site including construction of existing buildings, pathways and vehicle access (driveways and car parks); • Some filling of the site likely occurred for levelling purposes and around services; • Use of pesticides beneath buildings and around site; • Hazardous building materials (i.e. asbestos and lead in paint) may have been used in existing structures; • Installation and abandonment of diesel UST (circa 1999); • Installation and abandonment of diesel AST (circa 1999); and • Installation and use of grease trap (ongoing). Surrounding Area: • Ongoing residential development; and • Adjacent NSW Ambulance premises, remediation/removal of diesel UST and bowser (circa 2010).

2.7 Summary of Geology and Hydrogeology

2.7.1 Regional Geology and Soil Landscapes

Regional geological information reviewed for the previous investigations indicated that the site is underlain by Wombiana Formation Shale, which typically consists of buff to light coloured shales, siltstone, limestones and fine-grained sandstones and marble.

It is also noted that the Blayney Volcanics are mapped as being located approximately 300m to the south-west which have a medium potential for naturally occurring asbestos.

The Soil Landscape information indicated that the site is located within the Vittoria-Blayney soil landscape. Vittoria-Blayney soils are characterised by moderate erodibility with some higher local occurrences and low salinity.

A summary of the subsurface conditions encountered during the PSI is presented in the following table:

Table 2-4: Summary of Subsurface Conditions

Profile	Description
Fill	Fill was encountered at the surface or beneath the pavement in all boreholes and extended to depths of approximately 0.3mBGL to 1.2mBGL. BH10 was terminated in the fill at a maximum depth of approximately 0.6mBGL. The fill typically comprised clayey sand, gravelly clayey sand, silty clay with inclusions of brick and tile fragments, igneous, ironstone and sandstone gravel, clay nodules, slag, ash, coal and root fibres. No odours or staining were recorded in the fill material during field work. No FCF/ACM was encountered in the fill material during fieldwork.
Natural Soil	With the exception of BH10, natural residual silty clay or clayey silt soil was encountered beneath the fill material in all boreholes and extended to the maximum termination depth of the investigation at 6.45mBGL. No odours or staining were recorded in the natural soils during field work.
Groundwater	Groundwater seepage was encountered in BH3, BH5, BH6, BH17 and BH20 during drilling between 1.4mBGL and 6mBGL. SWLs measured in BH1, BH12, BH14, BH15 and BH20 on completion of drilling or a short time after ranged between 0.8mBGL and 5.4mBGL. All other boreholes remained dry on completion and a short time after drilling.

2.7.2 Acid Sulfate Soil (ASS) Risk and Planning

ASS information reviewed for the previous investigation indicated that the site is not located in an ASS risk area.

2.7.3 Hydrogeology

Hydrogeological information reviewed for the previous investigation indicated that the regional aquifer on-site and in the areas immediately surrounding the site includes fractured or fissured, extensive aquifers of low to moderate productivity. There was a total of 29 registered bores within the report buffer of 2,000m. In summary:

- The nearest registered bore was located approximately 215m south of the site. This was utilised for stock and domestic purposes;
- The majority of the bores were registered for water supply purposes;
- There closest down gradient bore was approximately 380m to the north-east of the site and was registered for water supply use; and
- The drillers log information from the closest registered bores typically identified fill and/or clay soil to depths of 8m-66m, underlain by shale or granite bedrock. Standing water levels (SWLs) in the bores ranged from 1mBGL to 30mBGL.

Groundwater seepage was encountered in BH3, BH5, BH6, BH17 and BH20 during drilling between 1.4mBGL and 6mBGL. SWLs measured in BH1, BH12, BH14, BH15 and BH20 on completion of drilling or a short time after ranged between 0.8mBGL and 5.4mBGL. All other boreholes remained dry on completion and a short time after drilling.

Table 2-5: Summary of Field Screening

<table>
<tr><th>Aspect</th><th>Details</th></tr>
<tr><td>Groundwater Depth & Flow</td><td>SWLs measured in the monitoring wells installed at the site ranged from 0.81mBGL to 4.38mBGL. Survey levels of the wells ranged from 873.70mAHD to 876.22mAHD. Groundwater RLs calculated on these measurements ranged from 78.60m to 82.83m.

<table>
<tr><th>MW reference</th><th>Reduced Level (mAHD)</th><th>SWL
(28 October 2022)</th><th>SWL (mAHD)</th></tr>
<tr><td>MW1</td><td>873.70</td><td>4.38</td><td>869.32</td></tr>
<tr><td>MW12</td><td>875.46</td><td>3.43</td><td>872.03</td></tr>
<tr><td>MW15</td><td>876.22</td><td>0.81</td><td>875.41</td></tr>
</table>

A contour plot was prepared for the groundwater levels as shown on Figure 5 included in the PSI. Groundwater flow generally occurs in a down gradient direction perpendicular to the groundwater elevation contours. The contour plot indicates that groundwater generally flows towards the north/north-east. This was consistent with expectations based on the topography and the location of the Belubula River.</td></tr>
<tr><td>Groundwater Field Parameters</td><td>Field measurements recorded during sampling were as follows:
- pH ranged from 5.81 to 6.35;
- EC ranged from 172.2µS/cm to 675µS/cm;
- Eh ranged from 57.1mV to 77.7mV; and
- DO ranged from 5.0mg/L to 6.8ppm.</td></tr>
<tr><td>LNAPLs petroleum hydrocarbons</td><td>Phase separated product (i.e. LNAPL) were not detected using the interphase probe during groundwater sampling.</td></tr>
</table>

2.7.4 Receiving Water Bodies

Surface water bodies were not identified in the immediate vicinity of the site. The closest surface water body is a tributary of the Belubula River located approximately 445m to the north-east of the site. This is down-gradient from site and is considered to be a potential receptor. The Belubula River proper is located approximately 795m to the north-east of the site at its closest point.

4 CONCEPTUAL SITE MODEL

NEPM (2013) defines a CSM as a representation of site related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. An iteration of the CSM for the site is presented in the following table and is based on the site information (including the site inspection information), the review of site history information and previous investigation findings).

4.1 Potential Contamination Sources/AEC and CoPC

The potential contamination sources/AEC and CoPC are presented in the following table:

Table 4-1: Potential (and/or known) Contamination Sources/AEC and Contaminants of Potential Concern

Source / AEC	CoPC
Fill material – The site appears to have been historically filled to achieve the existing levels. The fill may have been imported from various sources and could be contaminated. It is possible that the 'fill' is site won soil that has been pushed around/placed during previous earthworks. During the inspection evidence of fill (igneous gravel, brick and concrete fragments) were observed at the site surface. Chromium and asbestos were identified in fill soil samples during the PSI, at concentrations that exceeded the SAC.	Heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), petroleum hydrocarbons (referred to as total recoverable hydrocarbons – TRHs), benzene, toluene, ethylbenzene and xylene (BTEX), polycyclic aromatic hydrocarbons (PAHs), organochlorine pesticides (OCPs), organophosphate pesticides (OPPs), polychlorinated biphenyls (PCBs) and asbestos.
Fuel storage – At least one UST and one AST were identified at the site (see Figure 2). The NSW Health Representative indicated that both tanks had been used to store diesel, however were now redundant.	Heavy metals, TRH, BTEX and PAHs.
Use of pesticides – Pesticides may have been used beneath the buildings and/or around the site.	Heavy metals and OCPs.
Hazardous Building Material – Hazardous building materials may be present as a result of former building and demolition activities. These materials may also be present in the existing buildings/ structures on site. Asbestos was identified in fill soil in one location during the PSI.	Asbestos, lead and PCBs.
Naturally Occurring Asbestos – A medium risk of naturally occurring asbestos is mapped within 300m of the site. Asbestos was not detected in natural soil samples analysed for asbestos during the PSI. Sampling/analysis of bedrock for asbestos did not occur during the PSI as bedrock was not encountered to the maximum borehole depth of 6.45m.	Asbestos (bedrock).

Source / AEC	CoPC
Off-site Fuel Storage & Motor Mechanic– A diesel UST was indicated to have formerly been present on the adjacent and upgradient ambulance station. Personnel on the ambulance site indicated that the UST and bowser were remediated/removed circa 2010. A motor mechanics is located upgradient of the site.	Heavy metals, TRH, BTEX, volatile organic compounds (VOCs) possibly including chlorinated solvents, and PAHs.

4.2 Mechanism for Contamination, Affected Media, Receptors and Exposure Pathways

The mechanisms for contamination, affected media, receptors and exposure pathways relevant to the potential contamination sources/AEC are outlined in the following CSM table:

Table 4-2: CSM

Potential mechanism for contamination	Potential mechanisms for contamination include: • Fill material – importation of impacted material, 'top-down' impacts (e.g. placement of fill, leaching from surficial material etc), or sub-surface release (e.g. impacts from buried material); • Fuel storage – 'top-down', spills (e.g. during filling of the tanks and/or dispensing activities), or sub-surface release (e.g. from leaking tank or pipework); • Use of pesticides – 'top-down' and spills (e.g. during normal use, application and/or improper storage); • Hazardous building materials – 'top-down' (e.g. demolition resulting in surficial impacts in unpaved areas); • Naturally occurring asbestos – subsurface impacts in the natural bedrock; and • Off-site land uses – 'top-down', spill or sub-surface release. Impacts to the site could occur via migration of contaminated groundwater.
Affected media	Soil, soil vapour and groundwater have been identified as potentially affected media.
Receptor identification	Human receptors include site occupants/users (including adults and children), construction workers and intrusive maintenance workers. Off-site human receptors include adjacent land users, groundwater users and recreational water users in down-gradient water bodies. Ecological receptors include terrestrial organisms and plants within unpaved areas (including any proposed landscaped areas), and freshwater ecology in the tributary of the Belubula River.
Potential exposure pathways	Potential exposure pathways relevant to the human receptors include ingestion, dermal absorption and inhalation of dust (all contaminants) and vapours (volatile TRH, naphthalene and BTEX), together with incidental contact with groundwater. The potential for exposure would typically be associated with the construction and excavation works, future use of the site, and off-site groundwater use or primary/secondary contact with groundwater. Potential exposure pathways for ecological receptors include primary contact and ingestion.

	Exposure during future site use could occur via direct contact with soil in unpaved areas such as gardens, inhalation of airborne asbestos fibres during soil disturbance, or inhalation of vapours within enclosed spaces such as buildings. Exposure to groundwater could occur in the tributary of the Belubula River through direct migration if there is groundwater to surface water connectivity. Exposure to groundwater could also occur as a result of groundwater abstraction from groundwater bores and use of groundwater for irrigation/stock watering.
Potential exposure mechanisms	The following have been identified as potential exposure mechanisms for site contamination: • Vapour intrusion into the proposed buildings (either from soil contamination or volatilisation of contaminants from groundwater); • Contact (dermal, ingestion or inhalation) with exposed soils in landscaped areas and/or unpaved areas; • Potential disturbance of asbestos-containing natural bedrock formations during piling activities; • Migration of groundwater off-site and into nearby water bodies, including aquatic ecosystems and (possibly) those used for recreation; and • Migration of groundwater off-site into areas where groundwater is being utilised as a resource (i.e. for stock, irrigation and domestic uses).
Presence of preferential pathways for contaminant movement	None identified

5 SAMPLING, ANALYSIS AND QUALITY PLAN

5.1 Data Quality Objectives (DQO)

Data Quality Objectives (DQOs) were developed to define the type and quality of data required to achieve the project objectives outlined in Section 1.2. The DQOs were prepared with reference to the process outlined in Schedule B2 of NEPM (2013). The seven-step DQO approach for this project is outlined in the following sub-sections.

5.1.1 Step 1 - State the Problem

The previous investigations identified potential sources of contamination/AEC at the site that may pose a risk to human health and the environment. Additional investigation data is required to characterise the site, assess the risks posed by the contaminants in the context of the proposed development/intended land use, and facilitate the development of a RAP. This information will be considered by the project team in the design and delivery of the project as well as by the consent authority in exercising its planning functions in relation to the approval of the development consent and issue of construction/occupancy certificates.

The site is an operational hospital and there are constraints associated with access. Most notably, sampling within the building footprints is not practicable as this involves coring concrete and substantial disturbance. A data gap will remain in these areas and this will need to be compensated for via procedures in the RAP.

5.1.2 Step 2 - Identify the Decisions of the Study

The objectives of the investigation are outlined in Section 1.2. The decisions to be made reflect these objectives and are as follows:

- Are any of the laboratory results above the site assessment criteria?
- Do potential risks associated with contamination exist, and if so, what are they?
- Is further investigation/remediation required?
- What is the waste classification of the fill material and natural soils sampled and is further sampling/analysis required to confirm the waste classification(s)?
- Is the site suitable for the proposed development, or can the site be made suitable subject to further characterisation and/or remediation?

5.1.3 Step 3 - Identify Information Inputs

The primary information inputs required to address the decisions outlined in Step 2 include the following:

- Existing site information from the previous investigations, including site observations and site history documentation;
- Sampling of potentially affected media, including soil, soil vapour and groundwater;
- Observations of sub-surface variables such as soil type, photo-ionisation detector (PID) concentrations, odours and staining, and groundwater physiochemical parameters;
- Laboratory analysis of soils, fibre cement, soil vapour and groundwater for the CoPC identified in the CSM; and
- Field and laboratory QA/QC data.

5.1.4 Step 4 - Define the Study Boundary

The sampling will be confined to the site boundaries as shown in Figure 2 and will be limited vertically to maximum sampling depths of approximately 3mBGL (or prior refusal) for soil/bedrock, 1mBGL for soil vapour, and approximately 8mBGL for groundwater (spatial boundary). The sampling is expected to be completed in May 2023 (temporal boundary).

5.1.5 Step 5 - Develop an Analytical Approach (or Decision Rule)

The laboratory data will be assessed against relevant Tier 1 screening criteria (referred to as SAC), as outlined in Section 5.1.5.1. Exceedances of the SAC do not necessarily indicate a requirement for remediation or a risk to human health and/or the environment. Exceedances are considered in the context of the CSM and valid SPR-linkages.

For this investigation, the individual results will be assessed as either above or below the SAC. Statistical evaluation of the dataset via calculation of mean values and/or 95% upper confidence limit (UCL) values will likely not be undertaken due to the spatial distribution of the data and the data gaps associated with the access constraints.

Groundwater and soil vapour data will be compared directly to the SAC and evaluated with regards to valid/complete SPR-linkages. Groundwater data for volatile compounds will also be considered with other lines of evidence such as the soil vapour results.

5.1.5.1 Tier 1 Screening Criteria

5.1.5.1.1 Soil and Soil Vapour

Soil data will be compared to relevant Tier 1 screening criteria in accordance with NEPM (2013). Health Investigation Levels (HILs) will be based on a 'residential with accessible soils, including childcare' land use exposure scenario (HIL-A). These criteria have been adopted to make a preliminary assessment of risks to the most sensitive receptors (i.e. children). In our opinion, the other generic land-use types in NEPM (2013) are less appropriate for a hospital land use scenario where there are relatively large unpaved/grassed/landscape areas. Health Screening Levels (HSL) for asbestos will also be based on land use Type A.

HSLs for assessing hydrocarbon risks from vapour intrusion will be based on land use Type A/B and will be derived conservatively using a sand soil type and a depth interval of 0-1m for the initial data screening. These may be adjusted for depth and soil type where deemed appropriate.

HSLs for direct contact presented in the CRC Care Technical Report No. 10 – Health screening levels for hydrocarbons in soil and groundwater Part 1: Technical development document (2011). Management limits for petroleum hydrocarbons (as presented in Schedule B1 of NEPM 2013) will also be considered following evaluation of human health and ecological risks, and risks to groundwater.

Regarding the ecological screening criteria, the Ecological Investigation Levels (EIL) will be derived using the Ambient Background Concentration (ABC) from the document titled Trace Element Concentrations in Soils from Rural and Urban Areas of Australia (1995)[5] and using site specific physiochemical data for soil pH, clay content and Cation Exchange Capacity (CEC) to select the Added Contaminant Limit (ACL) values in Schedule B(1) of NEPM (2013). NEPM (2013) recommends that ecological SAC are applied to the top 2m of soil in accordance with the recommendations of the NEPM (2013).

Data for the waste classification assessment will be assessed in accordance with the Waste Classification Guidelines, Part 1: Classifying Waste (2014)[6].

Soil vapour data will be assessed against the HSL-A/B and interim HIL-A concentrations presented in Schedule B1 of NEPM (2013). Conservatively the HSLs will be derived using a 0-1m depth interval and a sand soil type. An alternative soil type (e.g. clay) may be used depending on the borehole observations.

5.1.5.1.2 Groundwater

Groundwater data will be compared to relevant Tier 1 screening criteria in accordance with NEPM (2013), following an assessment of environmental values in accordance with the Guidelines for the Assessment and Management of Groundwater Contamination (2007)[7]. Environmental values for this investigation include aquatic ecosystems, human uses, and human-health risks in non-use scenarios.

Where groundwater is observed to be deeper than 2mBGL and where there is at least 2m of soil above the groundwater and the proposed site level, the HSLs for a 'low-high density residential' exposure scenario (HSL-A/HSL-B) will be applied. HSLs will be calculated based on the soil type and the observed depth to groundwater.

It is noted that groundwater was recorded at depths shallower than 2mBGL during the previous investigations. On this basis, the NEPM (2013) HSLs will not be strictly applicable for some locations. Where these conditions occur and the NEPM (2013) HSLs cannot be applied, a SSA will be undertaken for the Tier 1 screening of human health risks posed by volatile contaminants in groundwater based on the following:

- Australian Drinking Water Guidelines 2011 (updated 2018)[8] for BTEX compounds and selected VOCs;
- World Health Organisation (WHO) document titled Petroleum Products in Drinking-water, Background document for the development of WHO Guidelines for Drinking Water Quality (2008)[9] for petroleum hydrocarbons. A conservative SAC of 100µg/L will be applied to TRH F1 and F2; and
- USEPA Region 9 screening levels for naphthalene (threshold value for tap water) and for any other contaminants reported above the PQLs, where there are no ADWG 2011 guidelines.

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5 Olszowy, H., Torr, P., and Imray, P., (1995), *Trace Element Concentrations in Soils from Rural and Urban Areas of Australia. Contaminated Sites Monograph Series No. 4*. Department of Human Services and Health, Environment Protection Agency, and South Australian Health Commission

6 NSW EPA, (2014). *Waste Classification Guidelines, Part 1: Classifying Waste.* (referred to as Waste Classification Guidelines 2014)

7 NSW Department of Environment and Conservation, (2007). *Guidelines for the Assessment and Management of Groundwater Contamination.*

8 National Health and Medical Research Council (NHMRC), (2018). *National Water Quality Management Strategy, Australian Drinking Water Guidelines 2011* (referred to as ADWG 2011)

9 World Health Organisation (WHO), (2008). *Petroleum Products in Drinking-water, Background document for the development of WHO Guidelines for Drinking Water Quality* (referred to as WHO 2008)

Notwithstanding the above in relation to vapour intrusion from groundwater, given that the DSI will also include collection of soil vapour data, the soil vapour data will carry more weight in the risk assessment of volatiles.

ADWG 2011 criteria will be multiplied by a factor of 10 to assess potential risks associated with incidental/recreational-type exposure to groundwater (e.g. incidental exposure during development works, primary and secondary contact with irrigation water or during recreational exposure). These have been deemed as 'recreational' SAC.

Groundwater Investigation Levels (GILs) for 95% protection of freshwater species are to be adopted based on the Default Guideline Values in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2018)[10]. The 99% trigger values are to be utilised, where required, to account for bioaccumulation. Low and moderate reliability trigger values are also to be adopted for some contaminants where high-reliability trigger values do not exist.

5.1.5.2 Quality Assurance/Quality Control (QA/QC)

Field QA/QC will include analysis of inter-laboratory duplicates (minimum of 5% of primary samples), intra-laboratory duplicates (minimum of 5% of primary samples), and trip spike (for volatiles), trip blank (for volatiles) and rinsate (for volatiles) samples (one for each medium sampled to assess the adequacy of field practices).

A leak test sample of the shroud will be collected and analysed during soil vapour sampling from one location. We note however that that the leak procedure and tracer will be assessed at all locations to assess the vapour pin installation in relation to leaks.

The suitability of the laboratory data is to be assessed against the laboratory QA/QC criteria which will be outlined in the laboratory reports. These criteria are developed and implemented in accordance with the laboratory's National Association of Testing Authorities, Australia (NATA) accreditation and align with the acceptable limits for QA/QC samples as outlined in NEPM (2013) and other relevant guidelines.

In the event that acceptable limits are not met by the laboratory analysis, other lines of evidence are reviewed (e.g. field observations of samples, preservation, handling etc) and, where required, consultation with the laboratory will be undertaken in an effort to establish the cause of the non-conformance. Where uncertainty exists, the most conservative concentration reported are to be adopted.

5.1.5.3 Appropriateness of Practical Quantitation Limits (PQLs)

The PQLs of the analytical methods are to be considered in relation to the SAC to confirm that the PQLs are less than the SAC. In cases where the PQLs are greater than the SAC, a discussion of this will be provided.

[10] Australian and New Zealand Governments (ANZG), (2018). *Australian and New Zealand Guidelines for Fresh and Marine Water Quality.* Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT, Australia (referred to as ANZG 2018)

5.1.6 Step 6 – Specify Limits on Decision Errors

To limit the potential for decision errors, a range of quality assurance processes are adopted. A quantitative assessment of the potential for false positives and false negatives in the analytical results will be undertaken with reference to Schedule B(3) of NEPM (2013) using the data quality assurance information collected.

Decision errors can be controlled through the use of hypothesis testing. The test can be used to show either that the baseline condition is false or that there is insufficient evidence to indicate that the baseline condition is false. The null hypothesis is an assumption that is assumed to be true in the absence of contrary evidence.

We do not anticipate applying statistical tests to the soil data due to the data gaps that will remain in the building footprints and we anticipate that results will be assessed as either above or below the SAC and in the context of valid SPR linkages. However, should statistical analysis be applied, for this investigation, the null hypothesis (H_0) is that the 95% UCL for the CoPC are greater than the SAC. The alternative hypothesis (H_A) is that the 95% UCL for the CoPC (and other considerations for asbestos and groundwater) are less than the SAC.

Potential outcomes include Type I and Type II errors as follows:

- Type I error of determining that the soil is acceptable for the proposed land use when it is not (wrongly rejects true H_0), includes an alpha (α) risk of 0.05; and
- Type II error of determining that the soil is unacceptable for the proposed land use when it is (wrongly accepts false H_0), includes beta (β) risk of 0.2.

Statistical analysis will not apply to asbestos, groundwater or soil vapour data, therefore these data will be assessed based on a multiple lines of evidence and a risk-based approach.

Data Quality Indicators (DQI) for field and laboratory QA/QC samples are defined below. An assessment of the DQI's is to be made in relation to precision, accuracy, representativeness, completeness and comparability.

Field Duplicates

Acceptable targets for precision of field duplicates will be 30% or less, consistent with NEPM (2013). RPD failures will be considered qualitatively on a case-by-case basis taking into account factors such as the concentrations used to calculate the RPD (i.e. RPD exceedance where concentrations are close to the PQL are typically not as significant as those where concentrations are reported at least five or 10 times the PQL), sample type, collection methods and the specific analyte where the RPD exceedance was reported.

Field/Trip Blanks and Rinsates

Acceptable targets for trip blank samples will be less than the PQL.

Trip Spikes

Acceptable targets for trip spike samples will be 70% to 130%.

Isopropanol Shroud

The isopropanol shroud sample is used for leak test purposes. The shroud sample intends to demonstrate a high isopropanol concentration, then the soil vapour samples ideally should not detect significant concentrations of isopropanol. A significant (>10mg/m^3) detection of isopropanol in the soil vapour samples may indicate a leak in the installation of the vapour implant and suggest that ambient air is being drawn into the installation during sampling.

Laboratory QA/QC

The suitability of the laboratory data will be assessed against the laboratory QA/QC criteria. These criteria are developed and implemented in accordance with the laboratory's NATA accreditation and align with the acceptable limits for QA/QC samples as outlined in NEPM (2013) and other relevant guidelines.

A summary of the typical limits is provided below:

RPDs

- Results that are <5 times the PQL, any RPD is acceptable; and
- Results >5 times the PQL, RPDs between 0-50% are acceptable.

Laboratory Control Samples (LCS) and Matrix Spikes

- 70-130% recovery acceptable for metals and inorganics; and
- 60-140% recovery acceptable for organics.

Surrogate Spikes

- 60-140% recovery acceptable for general organics.

Method Blanks

- All results less than PQL.

In the event that acceptable limits are not met by the laboratory analysis, other lines of evidence will be reviewed (e.g. field observations of samples, preservation, handling etc) and, where required, consultation with the laboratory is to be undertaken in an effort to establish the cause of the non-conformance. Where uncertainty exists, we will adopt the most conservative concentration reported.

5.1.7 Step 7 - Optimise the Design for Obtaining Data

The most resource-effective design will be used in an optimum manner to achieve the objectives. For this investigation, the design will be optimised via consideration of the various lines of evidence used to select the sample locations, the media being sampled, and also by the way in which the data will be collected. The sampling plan and methodology are outlined in the following sub-sections.

5.2 Soil Sampling Plan and Methodology

The soil sampling plan and methodology adopted for this investigation is outlined in the table below:

Table 5-1: Soil Sampling Plan and Methodology

Aspect	Input
Sampling Plan	Samples for the investigation will be collected from a total of 22 locations made up of boreholes and test pits. The proposed sample locations are shown on Figure 2a attached in Appendix A. Where practicable, samples are to be positioned on a square grid plan. However, this will not be achievable in all areas due to access constraints and therefore the plan overall is considered to be judgemental. The sampling locations are broadly positioned for site coverage, taking into consideration the previous sampling locations, identified AEC, and areas that are not easily accessible due to onsite obstructions (either above or below ground).
Set-out and Sampling Equipment	Sampling locations will be set out using a laser range finder or a tape measure, setout from the existing boundaries and site features. A margin of error in the order of ±1m is expected using the range finder. In-situ sampling locations will be checked for underground services by an external contractor prior to sampling. Samples will be collected using a combination of a mechanical excavator (directly from the bucket and/or from a pendulum auger) and a drill rig with spiral augers and standard penetration test (SPT) split spoon sampler. Soil samples will be obtained as follows: • From the walls of test pits where it is safe to do so, or from the excavator bucket. Where sampling occurs from the bucket, samples will be collected from clods of soil or material that is not in direct contact with the bucket; and • From the SPT sampler as a preference in boreholes, or from the auger where the SPT sampler is not effective (e.g. in bedrock)/excavator mounted auger. JKE acknowledge that the use of an auger for soil sampling may result in some loss of volatiles. However, we consider that there is no better alternative when sampling deeper bedrock.
Sample Collection and Field QA/QC	The locations are to be logged to an appropriate standard in accordance with NEPM (2013) and all samples will be documented on the logs. Soil samples for contamination are to be collected from the fill and natural profiles based on field observations, to depths as noted above. Samples for contamination analysis are to be placed in glass jars with plastic caps and Teflon seals with minimal headspace. Samples for asbestos analysis will be placed in zip-lock plastic bags. During sampling, soil at selected depths will be split into primary and duplicate samples for field QA/QC analysis. The splitting procedure will include alternate filling of the jars with soil.
Field Screening	A portable Photoionisation Detector (PID) fitted with a 10.6mV lamp will be used to screen the samples for the presence of volatile organic compounds (VOCs). PID screening for VOCs will be undertaken on soil samples using the soil sample headspace method. VOC data will be obtained from partly filled zip-lock plastic bags following equilibration of the headspace gases. PID calibration records are maintained on file by JKE and are to be included in the DSI report. Due to the occurrence of FA in fill in BH3 during the PSI, and in accordance with Section 5.5 of the Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2021)[11] (endorsed in NEPM 2013), fill/spoil from sampling locations BH111, BH112, BH116, BH117, BH121 and BH122 will be field screened for asbestos via visual inspection only and will not be sieved for quantifying asbestos. Soil samples from these locations will only be assessed for asbestos via laboratory analysis.

[11] Western Australian (WA) Department of Health (DoH), (2021). *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*. (referred to as WA DoH 2021)

Aspect	Input
	Fill/spoil from all other sampling location will be field screened. The field screening for asbestos quantification from the remaining sampling locations will include the following: • A bulk sample will be collected from fill at 1m intervals, or from each distinct fill profile to the extent possible; • Each bulk sample will be weighed using an electronic scale; • Each bulk sample will be passed through a sieve with a 7.1mm aperture and inspected for the presence of fibre cement. Alternatively, due to the cohesive nature of the soils, the samples may be placed on a contrasting support (blue tarpaulin) and inspected for the presence of fibre cement. Any soil clumps/nodules are to be disaggregated; • The condition of fibre cement or any other suspected asbestos materials will be noted on the field records; and • If observed, any fragments of fibre cement in the sample will be collected, placed in a zip-lock bag and assigned a unique identifier. Calculations for asbestos content will be undertaken based on the requirements outlined in Schedule B1 of NEPM (2013).
Decontamination and Sample Preservation	Sampling personnel will use disposable nitrile gloves during sampling activities. Re-usable sampling equipment will be decontaminated using Decon and potable water. Soil samples will be preserved by immediate storage in an insulated sample container with ice or ice bricks. On completion of the fieldwork, the samples will be stored temporarily in fridges in the JKE warehouse before being delivered in the insulated sample container to a NATA registered laboratory for analysis under standard chain of custody (COC) procedures.

5.3 Groundwater Sampling Plan and Methodology

The groundwater sampling plan and methodology is outlined in the table below:

Table 5-2: Groundwater Sampling Plan and Methodology

Aspect	Input
Sampling Plan	Where groundwater is present, it is proposed to sample the four existing groundwater wells that were installed during the fieldwork for the PSI. These include MW1, MW12, MW14, and MW15 as shown on Figure 2a in Appendix A. Three new wells are proposed, including MW101 positioned in the north-west of the site for site coverage, and, MW116 and MW117 positioned to the east of the redundant UST in the south-east of the site.
Monitoring Well Installation Procedure	We propose to install the three new groundwater monitoring wells using auger drilling methods. The monitoring well construction details are documented on the appropriate borehole logs attached in the appendices. The monitoring wells were installed to depths of approximately 8m below ground level. The wells were generally constructed as follows: • 50mm diameter Class 18 PVC (machine slotted screen) installed in the lower section of the well to intersect groundwater; • 50mm diameter Class 18 PVC casing installed in the upper section of the well (screw fixed); • A 2mm sand filter pack used around the screen section for groundwater infiltration; • A hydrated bentonite seal/plug used on top of the sand pack to seal the well; and • A gatic cover installed at the surface with a concrete plug to limit the inflow of surface water. The proposed well construction is considered to be appropriate for screening purposes to assess general aquifer conditions with regards to the recommended monitoring well installation

Aspect	Input
	requirements in Schedule B2 of NEPM 2013. The installation depths and screen intervals may vary depending on observations (i.e. water strike) during drilling.
Monitoring Well Development	Prior to development, the monitoring wells will be checked for the presence of Light Non-Aqueous Phase Liquids (LNAPL) and dense NAPL (DNAPL) using a new disposable bailer and the water level will be measured using an electronic dip meter. The monitoring well head space will also be checked for VOCs using a calibrated PID unit. The monitoring wells will be developed using a submersible electrical pump with single-use tubing. A calibrated water quality meter will be used to measure pH, EC, DO, Eh and temperature. Development will occur until either the well is pumped dry or until steady state conditions are achieved. For the DSI, steady state conditions are defined as the pH measurements over a one-minute time interval varying by less than 0.2 units, the difference in EC over the same period varying by less than 10%, and the SWL not being in drawdown. The monitoring wells will be allowed to recharge for approximately 2-3 days prior to sampling.
Groundwater Sampling	Prior to sampling, the monitoring wells will be checked for the presence of LNAPL/DNAPL using an inter-phase probe electronic dip meter and a new disposable bailer. The monitoring well head space will also be checked for VOCs using a calibrated PID unit. Samples will be obtained using a peristaltic pump, after purging to achieve steady state conditions. Where steady state conditions cannot be achieved, the wells will be sampled whilst the SWL is in drawdown. Groundwater samples will be obtained directly from the single use tubing and placed in the sample containers. Duplicate samples are to be obtained by alternate filling of sample containers. This technique will be adopted to minimise disturbance of the samples and loss of volatile contaminants associated with mixing of liquids in secondary containers, etc. Groundwater removed from the wells during sampling will be transported to JKE in jerry cans and stored in holding drums prior to collection by a licensed waste water contractor for off-site disposal.
Decontaminant and Sample Preservation	During development (and sampling), the pump will be flushed between monitoring wells with potable water (single-use tubing will be used for each well). The pump tubing will be discarded after each sampling event and replaced. The samples will be preserved with reference to the analytical requirements and placed in an insulated container with ice. On completion of the fieldwork, the samples may be temporarily stored in a fridge at the JKE office, before being delivered in the insulated sample container to a NATA registered laboratory for analysis under standard COC procedures.

5.4 Soil Vapour Sampling Plan and Methodology

The soil vapour sampling plan and methodology is outlined in the table below:

Table 5-3: Soil Vapour Sampling Plan and Methodology

Aspect	Input
Sampling Plan	Soil vapour samples will be collected from two soil vapour implants (SV1 and SV2) in the vicinity of the redundant UST, as shown on Figure 2a in Appendix A. Considering the identified source (USTs), the location is considered to be appropriate to address the objectives of the investigation.
Set-out and Sampling Equipment	The sampling locations will be set out as noted for the soil sample locations. Samples will be collected using canisters (TO-15 sampling method), from the vapour implants.
Vapour implant Installation	Soil vapour implants will be installed by JKE to 1mBGL. The implant will be installed generally as follows: • The implant location will be drilled to 1.2mBGL using either hand equipment or a drill rig equipped with spiral auger; • A 0.2m layer of 2mm sand will be installed in the base of the well; • The implant will be suspended at the surface of the sand layer at approximately 1mBGL; • A 2mm sand filter pack will be installed around the implant for vapour infiltration; • A 0.5m bentonite seal/plug will be installed on top of the sand pack to seal the installation; and • A flush metal cover will be installed at the surface to limit the inflow of surface water and damage to the implant. The soil gas conditions will be allowed to re-equilibrate for at least 60 minutes before soil vapour sampling.
Soil vapour Sampling (USEPA TO-15)	Soil vapour sampling will utilise single-use tubing and other sampling apparatus (e.g. soil vapour implant, canisters, flow restrictors), therefore no decontamination procedures are considered necessary. The NATA registered laboratory will supply JKE with the sampling apparatus which will include a "*Certificate of Cleanliness*" confirming that the canisters are clean. 1L canisters will be utilised, which include flow restrictors on the sampling trains that restrict flow to 100mL/minute. The following procedures are to be implemented for soil vapor sampling: • Leak detection will be undertaken by placing a cloth soaked in isopropyl alcohol (IPA) into the shroud. At one of the soil vapour sampling locations a laboratory supplied syringe will be used to draw air from within the shroud through a thermal desorption carbon tube which will be analysed for isopropanol/IPA; • A shut in/leak test will be undertaken to test the integrity of the vacuum on the sample train. Once the shut-in/leak test is passed, this will be recorded on the COC documents; • Approximately 300mL of air is to be purged through the sample collection pathway using laboratory supplied syringe. The purged volume is to be recorded on the COC; • Once the above has been completed, the following procedure is implemented for soil vapour sampling: ➢ Connect the female connector to the Teflon tubing extending from the soil vapour implant to the sampling train (note: these will already be connected from the purging stage) and then to the canister; ➢ Open the valve on the canister and the sample will begin to collect in the canister. The vacuum gauge on the canister will be checked to ensure that a vacuum of approximately -26 to -30" Hg is present within the canister. The initial vacuum level and initial sampling time will be recorded on the COC;

Aspect	Input
	➢ Sampling should continue until a vacuum level of approximately -5 to -4" Hg is present within the canister, with sampling stopped by closing the valve on the canister. The final vacuum level and final sampling time will be recorded on the COC; and ➢ Disconnect the canister and the sample train. • Duplicate sampling is to be undertaken using a 'T' connection piece simultaneously with the primary sample. On completion of the fieldwork, the soil vapour samples may be temporarily stored prior to delivery to a NATA registered laboratory for analysis under standard COC procedures and within recommended holding times.
Meteorological Data and other gases	Barometric pressure, wind speed and temperature data will be obtained from the Bureau of Meteorology website on the day of monitoring. A portable GFM landfill gas analyser (or similar) and the PID will be connected to the implant after the samples are collected to measure oxygen, methane, carbon dioxide, carbon monoxide, hydrogen sulfide and the PID reading.

5.4.1 Laboratory Analysis

Samples were analysed by an appropriate, NATA Accredited laboratory using the analytical methods detailed in Schedule B(3) of NEPM 2013. Reference should be made to the laboratory reports attached in the appendices for further details.

Table 5-4: Laboratory Details

Samples	Laboratory
All primary samples and field QA/QC samples including (intra-laboratory duplicates, trip blanks, trip spikes, field rinsate and shroud samples)	Envirolab Services Pty Ltd NSW, NATA Accreditation Number – 2901 (ISO/IEC 17025 compliance)
Inter-laboratory duplicates soil and groundwater samples	Envirolab Services Pty Ltd VIC, NATA Accreditation Number – 2901 (ISO/IEC 17025 compliance)

An allowance has been made for the following:

- Up to 10 selected soil samples will be analysed for: heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc); polycyclic aromatic hydrocarbons (PAHs); total recoverable hydrocarbons (TRH); monocyclic aromatic hydrocarbons (BTEX); organochlorine pesticides (OCPs) and organophosphate pesticides (OPPs); polychlorinated biphenyls (PCBs); and asbestos (500ml);
- Up to 30 selected fill/natural soil samples will be analysed for: heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc); PAHs; TRH; BTEX; and asbestos (500ml);
- Up to six selected soil samples will be analysed for chromium IV (hexavalent chromium). We anticipate this analysis will occur on samples with the highest total chromium results;
- Up to eight selected fibre cement fragments, if found on or in soil, will be analysed for asbestos;
- A nominal allowance for TCLP leachability analysis for PAHs and selected metals has been included to provide a preliminary waste classification for the off-site disposal of soil in accordance with NSW EPA *Waste Classification Guidelines - Part 1: Classifying Waste* (2014);

- Up to seven groundwater samples will be analysed for the following: heavy metals; TRH/BTEX; low level PAHs; Volatile Organic Compounds (VOCs); pH; and EC;
- Up to two soil vapour samples will be analysed for: VOCs (including BTEX and naphthalene) and TRH (F1 and F2); and
- Selected samples will be analysed for cation exchange capacity (CEC), clay content and pH to derive the EILs where appropriate; and
- Collection and analysis of QA/QC samples (including intra- and inter-laboratory duplicates, trip blank, trip spike, field rinsate and shroud samples).

The soil analysis will generally be targeted to fill samples. Deeper samples may be analysed based on the results of the fill soils, or if other indicators such as staining or odours are encountered. A staged approach to soil sample analysis will be undertaken to allow for targeting areas based on the results of the initial analysis.

5.5 Reporting Requirements

A DSI report is to be prepared presenting the results of the investigation, generally in accordance with the NSW EPA Consultants Reporting on Contaminated Land, Contaminated Land Guidelines (2020)[12].

[12] NSW EPA, (2020). *Consultants Reporting on Contaminated Land, Contaminated Land Guidelines*

6 LIMITATIONS

The report limitations are outlined below:

- JKE accepts no responsibility for any unidentified contamination issues at the site. Any unexpected problems/subsurface features that may be encountered during development works should be inspected by an environmental consultant as soon as possible;
- Previous use of this site may have involved excavation for the foundations of buildings, services, and similar facilities. In addition, unrecorded excavation and burial of material may have occurred on the site. Backfilling of excavations could have been undertaken with potentially contaminated material that may be discovered in discrete, isolated locations across the site during construction work;
- This report has been prepared based on site conditions which existed at the time of the investigation; scope of work and limitation outlined in the JKE proposal; and terms of contract between JKE and the client (as applicable);
- The conclusions presented in this report are based on investigation of conditions at specific locations, chosen to be as representative as possible under the given circumstances, visual observations of the site and immediate surrounds and documents reviewed as described in the report;
- Subsurface soil and rock conditions encountered between investigation locations may be found to be different from those expected. Groundwater conditions may also vary, especially after climatic changes;
- The investigation and preparation of this report have been undertaken in accordance with accepted practice for environmental consultants, with reference to applicable environmental regulatory authority and industry standards, guidelines and the assessment criteria outlined in the report;
- Where information has been provided by third parties, JKE has not undertaken any verification process, except where specifically stated in the report;
- JKE has not undertaken any assessment of off-site areas that may be potential contamination sources or may have been impacted by site contamination, except where specifically stated in the report;
- JKE accept no responsibility for potentially asbestos containing materials that may exist at the site. These materials may be associated with demolition of pre-1990 constructed buildings or fill material at the site;
- JKE have not and will not make any determination regarding finances associated with the site;
- Additional investigation work may be required in the event of changes to the proposed development or landuse. JKE should be contacted immediately in such circumstances;
- Material considered to be suitable from a geotechnical point of view may be unsatisfactory from a soil contamination viewpoint, and vice versa; and
- This report has been prepared for the particular project described and no responsibility is accepted for the use of any part of this report in any other context or for any other purpose.

Important Information About This Report

These notes have been prepared by JKE to assist with the interpretation of this report.

The Report is based on a Unique Set of Project Specific Factors:
This report has been prepared in response to specific project requirements as stated in the JKE proposal document which may have been limited by instructions from the client. This report should be reviewed, and if necessary, revised if any of the following occur:

- The proposed land use is altered;
- The defined subject site is increased or sub-divided;
- The proposed development details including size, configuration, location, orientation of the structures or landscaped areas are modified;
- The proposed development levels are altered, eg addition of basement levels; or
- Ownership of the site changes.

JKE will not accept any responsibility whatsoever for situations where one or more of the above factors have changed since completion of the assessment. If the subject site is sold, ownership of the assessment report should be transferred by JKE to the new site owners who will be informed of the conditions and limitations under which the assessment was undertaken. No person should apply an assessment for any purpose other than that originally intended without first conferring with the consultant.

Changes in Subsurface Conditions:
Subsurface conditions are influenced by natural geological and hydrogeological process and human activities. Groundwater conditions are likely to vary over time with changes in climatic conditions and human activities within the catchment (e.g. water extraction for irrigation or industrial uses, subsurface waste water disposal, construction related dewatering). Soil and groundwater contaminant concentrations may also vary over time through contaminant migration, natural attenuation of organic contaminants, ongoing contaminating activities and placement or removal of fill material. The conclusions of an assessment report may have been affected by the above factors if a significant period of time has elapsed prior to commencement of the proposed development.

This Report is based on Professional Interpretations of Factual Data:
Site assessments identify actual subsurface conditions at the actual sampling locations at the time of the investigation. Data obtained from the sampling and subsequent laboratory analyses, available site history information and published regional information is interpreted by geologists, engineers or environmental scientists and opinions are drawn about the overall subsurface conditions, the nature and extent of contamination, the likely impact on the proposed development and appropriate remediation measures.

Actual conditions may differ from those inferred, because no professional, no matter how qualified, and no subsurface exploration program, no matter how comprehensive, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than an assessment indicates. Actual conditions in areas not sampled may differ from predictions. Nothing can be done to prevent the unanticipated, but steps can be taken to help minimise the impact. For this reason, site owners should retain the services of their consultants throughout the development stage of the project, to identify variances, conduct additional tests which may be needed, and to recommend solutions to problems encountered on site.

Investigation Limitations:
Although information provided by an investigation can reduce exposure to the risk of the presence of contamination, no investigation can eliminate the risk. Even a rigorous professional assessment may not detect all contamination on a site. Contaminants may be present in areas that were not surveyed or sampled, or may migrate to areas which showed no signs of contamination when sampled. Contaminant analysis cannot possibly cover every type of contaminant which may occur; only the most likely contaminants are screened.

Misinterpretation of Reports by Design Professionals:
Costly problems can occur when design professionals develop plans based on misinterpretation of the report. To minimise problems associated with misinterpretations, the environmental consultant should be retained to work with appropriate professionals to explain relevant findings and to review the adequacy of plans and specifications relevant to contamination issues.

Logs Should not be Separated from the Report:
Borehole and test pit logs are prepared by environmental scientists, engineers or geologists based upon interpretation of field conditions and laboratory evaluation of field samples. Logs are normally provided in our reports and these should not be re-drawn for inclusion in site remediation or other design drawings, as subtle but significant drafting errors or omissions may occur in the transfer process. Photographic reproduction can eliminate this problem, however contractors can still misinterpret the logs during bid preparation if separated from the text of the assessment. If this occurs, delays, disputes and unanticipated costs may result. In all cases it is necessary to refer to the rest of the report to obtain a proper understanding of the assessment. Please note that logs with the 'Environmental Log' header are not suitable for geotechnical purposes as they have not been peer reviewed by a Senior Geotechnical Engineer.

To reduce the likelihood of borehole and test pit log misinterpretation, the complete report should be available to persons or organisations involved in the project, such as contractors, for their use. Denial of such access and disclaiming responsibility for the accuracy of subsurface information does not insulate an owner from the attendant liability. It is critical that the site owner provides all available site information to persons and organisations such as contractors.

Read Responsibility Clauses Closely:
As the investigation is based extensively on judgement and opinion, it is necessary less exact than other disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, model clauses have been developed for use in written transmittals. These are definitive clauses designed to indicate consultant responsibility. Their use helps all parties involved recognise individual responsibilities and formulate appropriate action. Some of these definitive clauses are likely to appear in the report, and you are encouraged to read them closely.

Appendix A: JKE SAQP Figures

PLOT DATE: 18/11/2022 9:12:16 AM DWG FILE: K:\5C EIS JOBS\35000'S\E35521PT BLAYNEY\CAD\E35521PT.DWG

AERIAL IMAGE SOURCE: MAPS.SIX.NSW.GOV.AU

This plan should be read in conjunction with the Environmental report.

Title:	**SITE LOCATION PLAN**
Location:	BLAYNEY DISTRICT HOSPITAL, 3 OSMAN STREET, BLAYNEY, NSW
Project No: E35521PT	Figure No: 1

JKEnvironments

LEGEND

APPROXIMATE SITE BOUNDARY

AERIAL IMAGE SOURCE: MAPS.SIX.NSW.GOV.AU

0 8 16 24 32 40

SCALE 1:800 @A3 METRES

This plan should be read in conjunction with the Environmental report.

Title: **SITE FEATURES PLAN**

Location: BLAYNEY DISTRICT HOSPITAL, 3 OSMAN STREET, BLAYNEY, NSW

Project No: E35521PT

Figure No: 2

JKEnvironments

PLOT DATE: 18/11/2022 9:13:56 AM DWG FILE: K:\5C EIS JOBS\35000'S\E35521PT BLAYNEY\CAD\E35521PT.DWG

LEGEND

(red dashed line)	APPROXIMATE SITE BOUNDARY
BH(Fill Depth)	BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m) (JKE, 2022)
BH/MW(Fill Depth)	BOREHOLE AND GROUNDWATER MONITORING WELL LOCATION, NUMBER AND DEPTH OF FILL (m) (JKE, 2022)
BH	PROPOSED BOREHOLE LOCATION AND NUMBER
BH/MW	PROPOSED BOREHOLE AND GROUNDWATER MONITORING WELL LOCATION AND NUMBER
▲ SV1	SOIL VAPOUR IMPLANT

AERIAL IMAGE SOURCE: MAPS.SIX.NSW.GOV.AU

0 8 16 24 32 40

SCALE 1:800 @A3 METRES

This plan should be read in conjunction with the Environmental report.

Title: **PROPOSED DSI SAMPLE LOCATION PLAN**

Location: BLAYNEY DISTRICT HOSPITAL, 3 OSMAN STREET, BLAYNEY, NSW

Project No: E35521PT

Figure No: 2a

JKEnvironments

PLOT DATE: 9/05/2023 3:56:58 PM DWG FILE: K:\5C EIS JOBS\35000'S\E35521PT BLAYNEY\CAD\E35521PT.DWG

Appendix B: Report Explanatory Notes

QA/QC Definitions

The QA/QC terms used in this report are defined below. The definitions are in accordance with US EPA publication SW-846, entitled *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (1994)[13] methods and those described in *Environmental Sampling and Analysis, A Practical Guide,* (1991)[14]. The NEPM (2013) is consistent with these documents.

A. Practical Quantitation Limit (PQL), Limit of Reporting (LOR) & Estimated Quantitation Limit (EQL)

These terms all refer to the concentration above which results can be expressed with a minimum 95% confidence level. The laboratory reporting limits are generally set at ten times the standard deviation for the Method Detection Limit for each specific analyte. For the purposes of this report the LOR, PQL, and EQL are considered to be equivalent.

When assessing laboratory data it should be borne in mind that values at or near the PQL have two important limitations: *"The uncertainty of the measurement value can approach, and even equal, the reported value. Secondly, confirmation of the analytes reported is virtually impossible unless identification uses highly selective methods. These issues diminish when reliably measurable amounts of analytes are present. Accordingly, legal and regulatory actions should be limited to data at or above the reliable detection limit"* (Keith, 1991).

B. Precision

The degree to which data generated from repeated measurements differ from one another due to random errors. Precision is measured using the standard deviation or Relative Percent Difference (RPD).

C. Accuracy

Accuracy is a measure of the agreement between an experimental result and the true value of the parameter being measured (i.e. the proximity of an averaged result to the true value, where all random errors have been statistically removed). The assessment of accuracy for an analysis can be achieved through the analysis of known reference materials or assessed by the analysis of surrogates, field blanks, trip spikes and matrix spikes. Accuracy is typically reported as percent recovery.

D. Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness is primarily dependent upon the design and implementation of the sampling program. Representativeness of the data is partially ensured by the avoidance of contamination, adherence to sample handing and analysis protocols and use of proper chain-of-custody and documentation procedures.

E. Completeness

Completeness is a measure of the number of valid measurements in a data set compared to the total number of measurements made and overall performance against DQIs. The following information is assessed for completeness:

- Chain-of-custody forms;
- Sample receipt form;
- All sample results reported;

[13] US EPA, (1994). *SW-846: Test Methods for Evaluating Solid Waste, Physical/Chemical Methods.* (US EPA SW-846)
[14] Keith., H, (1991). *Environmental Sampling and Analysis, A Practical Guide*

- All blank data reported;
- All laboratory duplicate and RPDs calculated;
- All surrogate spike data reported;
- All matrix spike and lab control spike (LCS) data reported and RPDs calculated;
- Spike recovery acceptable limits reported; and
- NATA stamp on reports.

F. Comparability

Comparability is the evaluation of the similarity of conditions (e.g. sample depth, sample homogeneity) under which separate sets of data are produced. Data comparability checks include a bias assessment that may arise from the following sources:

- Collection and analysis of samples by different personnel; Use of different techniques;
- Collection and analysis by the same personnel using the same methods but at different times; and
- Spatial and temporal changes (due to environmental dynamics).

G. Blanks

The purpose of laboratory and field blanks is to check for artefacts and interferences that may arise during sampling, transport and analysis.

H. Matrix Spikes

Samples are spiked with laboratory grade standards to detect interactive effects between the sample matrix and the analytes being measured. Matrix Spikes are reported as a percent recovery and are prepared for 1 in every 20 samples. Sample batches that contain less than 20 samples may be reported with a Matrix Spike from another batch. The percent recovery is calculated using the formula below. Acceptable recovery limits are 70% to 130%.

$$\frac{(\text{Spike Sample Result} - \text{Sample Result}) \times 100}{\text{Concentration of Spike Added}}$$

I. Surrogate Spikes

Samples are spiked with a known concentration of compounds that are chemically related to the analyte being investigated but unlikely to be detected in the environment. The purpose of the Surrogate Spikes is to check the accuracy of the analytical technique. Surrogate Spikes are reported as percent recovery.

J. Duplicates

Laboratory duplicates measure precision, expressed as Relative Percent Difference. Duplicates are prepared from a single field sample and analysed as two separate extraction procedures in the laboratory. The RPD is calculated using the formula where D1 is the sample concentration and D2 is the duplicate sample concentration:

$$\frac{(D1 - D2) \times 100}{\{(D1 + D2)/2\}}$$

Appendix C: Guidelines and Reference Documents

Contaminated Land Management Act 1997 (NSW)

Managing Land Contamination, Planning Guidelines SEPP55 – Remediation of Land (1998)

NSW EPA, (2015). Guidelines on the Duty to Report Contamination under Section 60 of the CLM Act 1997

NSW EPA, (2017). Guidelines for the NSW Site Auditor Scheme, 3rd Edition

NSW EPA, (2020). Consultants Reporting on Contaminated Land, Contaminated Land Guidelines

NSW EPA, (2022). Sampling Design Part 1 - application

National Environment Protection Council (NEPC), (2013). National Environmental Protection (Assessment of Site Contamination) Measure 1999 as amended (2013)

State Environmental Planning Policy No.55 – Remediation of Land 1998 (NSW)

U.S. Environmental Protection Agency, (1999). Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition, Compendium Method TO-17 Determination of Volatile Organic Compounds in Ambient Air Using Active Sampling Onto Sorbent Tubes.

Groundwater & Calibration Field Sheets

JKEnvironments

Client:	HI c/- APP	**Job No.:**	E35521PT
Project:	Proposed Hospital Development	**Well No.:**	MW1
Location:	3 Osman Street, BLAYNEY, NSW	**Depth (m):**	6.0

WELL FINISH DETAILS

Gatic Cover ☑ Standpipe ☐ Other (describe) ☐

WELL DEVELOPMENT DETAILS

Method:	Development pump	**SWL – Before (m):**	Dry
Date:	18/5/23	**Time – Before:**	3:24pm
Undertaken By:	HW	**SWL – After (m):**	Dry
Total Vol. Removed:	–	**Time – After:**	3:30pm
PID Reading (ppm):	0.5		

Comments:

DEVELOPMENT MEASUREMENTS

Volume Removed (L)	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
Well effectively dry					

Comments: Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)

YSI Used: 5

Tested By:	HW
Date Tested:	18/5/23
Checked By:	KT
Date:	30.05.23

Remarks:
- Steady state conditions
- Difference in the pH less than 0.2 units, difference in the conductiveity less than 10% and SWL stable/not in drawdown
- Minimum 3 monitoring well volumes purged, unless well purged until it is effectively dry

JKEnvironments

Client:	HI c/- APP	**Job No.:**	**E35521PT**
Project:	Proposed Hospital Development	**Well No.:**	MW12
Location:	3 Osman Street, BLAYNEY, NSW	**Depth (m):**	6.0

WELL FINISH DETAILS

	Gatic Cover ☑	**Standpipe** ☐	**Other (describe)** ☐

WELL DEVELOPMENT DETAILS

Method:	Development pump	**SWL – Before (m):**	3.54
Date:	18/5/23	**Time – Before:**	4:15pm
Undertaken By:	HW	**SWL – After (m):**	Dry
Total Vol. Removed:	~6L	**Time – After:**	4:22pm
PID Reading (ppm):	0		

Comments:

DEVELOPMENT MEASUREMENTS

Volume Removed (L)	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
4	15.3	~~6.1~~ 4.1	~~56~~ 852	~~878~~ 6.23	-167.5
6	15.6	3.0	853	6.26	-170.7
well dry					

Comments:Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)

YSI Used: 5

Slightly silty. Low recharge.

Tested By:	HW	**Remarks:** - Steady state conditions - Difference in the pH less than 0.2 units, difference in the conductiveity less than 10% and SWL stable/not in drawdown - Minimum 3 monitoring well volumes purged, unless well purged until it is effectively dry
Date Tested:	18/5/23	
Checked By:	KT	
Date:	30.05.23	

JKEnvironments

Client:	HI c/- APP	**Job No.:**	E35521PT
Project:	Proposed Hospital Development	**Well No.:**	MW14
Location:	3 Osman Street, BLAYNEY, NSW	**Depth (m):**	6.0

WELL FINISH DETAILS

Gatic Cover ☑ Standpipe ☐ Other (describe) ☐

WELL DEVELOPMENT DETAILS

Method:	Development pump	**SWL – Before (m):**	1.94
Date:	18/5/23	**Time – Before:**	3:38pm
Undertaken By:	HW	**SWL – After (m):**	DRY
Total Vol. Removed:	~13L	**Time – After:**	3:45pm
PID Reading (ppm):	0.1		

Comments:

DEVELOPMENT MEASUREMENTS

Volume Removed (L)	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
3	18.2	5.4	947	6.61	-115.7
6	17.8	5.7	835	6.55	-121.7
10	18.2	4.7	1168	6.40	-126.5
13	18.2	2.9	1203	6.45	-130.1

Comments: **Odours (YES / NO)** **NAPL/PSH (YES / NO)**, **Sheen (YES / NO)** **Steady State Achieved (YES / NO)**

YSI Used: 5

moderate recharge. slightly silty.

Tested By:	HW	**Remarks:**
Date Tested:	18/5/23	- Steady state conditions - Difference in the pH less than 0.2 units, difference in the conductiveity less than 10% and SWL stable/not in drawdown - Minimum 3 monitoring well volumes purged, unless well purged until it is effectively dry
Checked By:	KT	
Date:	30.05.23	

JKEnvironments

Client:	HI c/- APP	**Job No.:**	E35521PT
Project:	Proposed Hospital Development	**Well No.:**	MW115
Location:	3 Osman Street, BLAYNEY, NSW	**Depth (m):**	6.0

WELL FINISH DETAILS

	Gatic Cover ☑	**Standpipe** ☐	**Other (describe)** ☐

WELL DEVELOPMENT DETAILS

Method:	Development pump	**SWL – Before (m):**	2.39
Date:	18/5/23	**Time – Before:**	3:56pm
Undertaken By:	HW	**SWL – After (m):**	Dry
Total Vol. Removed:	~8L	**Time – After:**	4:03pm
PID Reading (ppm):	0		

Comments:

DEVELOPMENT MEASUREMENTS

Volume Removed (L)	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
4	16.4	10.4	358.3	6.38	-139.2
6	16.6	4.0	357.6	6.01	-144.5
8	16.7	3.2	351.9	6.75	-150.5
well dry					

Comments:Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)

YSI Used:
5

slightly silty Low recharge.

Tested By:	HW	**Remarks:**
Date Tested:	18/5/23	- Steady state conditions - Difference in the pH less than 0.2 units, difference in the conductiveity less than 10% and SWL stable/not in drawdown - Minimum 3 monitoring well volumes purged, unless well purged until it is effectively dry
Checked By:	KT	
Date:	30.05.23	

JKEnvironments

Client:	HI c/- APP	**Job No.:**	E35521PT
Project:	Proposed Hospital Development	**Well No.:**	MW101
Location:	3 Osman Street, BLAYNEY, NSW	**Depth (m):**	8.0

WELL FINISH DETAILS

	Gatic Cover ☑	**Standpipe** ☐	**Other (describe)** ☐

WELL DEVELOPMENT DETAILS

Method:	Development pump	**SWL – Before (m):**	4.25
Date:	18/5/23	**Time – Before:**	4:42pm
Undertaken By:	HN	**SWL – After (m):**	~~&~~ Dry
Total Vol. Removed:	~10L	**Time – After:**	4:51pm
PID Reading (ppm):	0.5		

Comments:

DEVELOPMENT MEASUREMENTS

Volume Removed (L)	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
4	15.3	15.4	1006	6.45	-191.6
6	15.6	8.5	1073	6.35	-194.5
10	15.9	7.1	1055	6.33	-196.3
well dry					

Comments:Odours (YES / NO) NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)

YSI Used: 5

Silty and yellow brown. Low recharge.

Tested By:	HN	**Remarks:** - Steady state conditions - Difference in the pH less than 0.2 units, difference in the conductiveity less than 10% and SWL stable/not in drawdown - Minimum 3 monitoring well volumes purged, unless well purged until it is effectively dry
Date Tested:	18/5/23	
Checked By:	KT	
Date:	30-05-23	

JKEnvironments

Client:	HI c/- APP	Job No.:	E35521PT
Project:	Proposed Hospital Development	Well No.:	MW116
Location:	3 Osman Street, BLAYNEY, NSW	Depth (m):	8.0

WELL FINISH DETAILS

Gatic Cover ☑ Standpipe ☐ Other (describe) ☐

WELL DEVELOPMENT DETAILS

Method:	development pump	SWL – Before (m):	6.60
Date:	17/5/23	Time – Before:	5:45pm
Undertaken By:	HW	SWL – After (m):	Dry
Total Vol. Removed:	~6L	Time – After:	5:56pm
PID Reading (ppm):	1.2		

Comments:

DEVELOPMENT MEASUREMENTS

Volume Removed (L)	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
3	17.5	7.3	381.4	6.13	-116.1
6	17.5	6.5	384.3	6.10	-120.0
Well dry					

Comments:Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)

YSI Used: 5

Silty brown water. Low recharge.

Tested By:	HW	**Remarks:** - Steady state conditions - Difference in the pH less than 0.2 units, difference in the conductiveity less than 10% and SWL stable/not in drawdown - Minimum 3 monitoring well volumes purged, unless well purged until it is effectively dry
Date Tested:	17/5/23	
Checked By:	KT	
Date:	30.05.23	

JKEnvironments

Client:	HI c/- APP	Job No.:	E35521PT
Project:	Proposed Hospital Development	Well No.:	MW117
Location:	3 Osman Street, BLAYNEY, NSW	Depth (m):	8.0

WELL FINISH DETAILS

Gatic Cover ☑ Standpipe ☐ Other (describe) ☐

WELL DEVELOPMENT DETAILS

Method:	Development pump	SWL – Before (m):	3.13
Date:	17/5/23	Time – Before:	5:26pm
Undertaken By:	HW	SWL – After (m):	Dry
Total Vol. Removed:	~15L	Time – After:	5:35pm
PID Reading (ppm):	0.5		

Comments:

DEVELOPMENT MEASUREMENTS

Volume Removed (L)	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
2	17.9	5.9	290.4	6.27	-131.5
5	18.4	5.8	305.9	6.14	-132.9
10	19.0	6.7	328.9	6.04	-135.0
15	18.6	7.2	277.7	6.12	-138.0
well dry					

Comments: Odours (YES / NO) NAPL/PSH (YES / NO) Sheen (YES / NO) Steady State Achieved (YES / NO)

YSI Used: 5

Silty water. yellow brown. moderate recharge.

Tested By:	HW	**Remarks:** - Steady state conditions - Difference in the pH less than 0.2 units, difference in the conductiveity less than 10% and SWL stable/not in drawdown - Minimum 3 monitoring well volumes purged, unless well purged until it is effectively dry
Date Tested:	17/5/23	
Checked By:	KT	
Date:	30.05.23	

JKEnvironments

WATER QUALITY METER CALIBRATION FORM

Client:	HI c/- APP		
Project:	Proposed Hospital Development		
Location:	3 Osman Street, BLAYNEY, NSW		
Job Number:	E35521PT		
DISSOLVED OXYGEN			
Make: YSI		Model: Professional plus	
Date of calibration: 17/5/23		Name of Calibrator: HW	
Span value: 70% to 130%			
Measured value: 114%			
Measured reading Acceptable (Yes/No):			
pH			
Make: YSI		Model: Professional plus	
Date of calibration: 17/5/23		Name of Calibrator: HW	
Buffer 1: Theoretical pH = 7.01± 0.01		Expiry date: June/23	Lot No: 384001
Buffer 2: Theoretical pH = 4.01± 0.01		Expiry date: May/24	Lot No: 398326
Measured reading of Buffer 1: 7.01			
Measured reading of Buffer 2: 3.96			
Slope: —		Measured reading Acceptable (Yes/No):	
EC			
Make: YSI		Model: Professional plus	
Date: 17/5/23	Name of Calibrator: HW		Temperature: 21.7°C
Calibration solution: Conductivity Standard		Expiry date: Sep/25	Lot No: 386922
Theoretical conductivity at temperature (see solution container): 1332 µS/cm			
Measured conductivity: 1218 µS/cm		Measured reading Acceptable (Yes/No):	
REDOX			
Make: YSI		Model: Professional plus	
Date of calibration: 17/5/23		Name of Calibrator: HW	
Calibration solution: ORP Test Solution		Expiry date: Sep/27	Lot No: 8169
Theoretical redox value: 240mV			
Measured redox reading: 235.7 mV		Measured reading Acceptable (Yes/No):	

JKEnvironments

WATER QUALITY METER CALIBRATION FORM

Client:	HI c/- APP		
Project:	Proposed Hospital Development		
Location:	3 Osman Street, BLAYNEY, NSW		
Job Number:	E35521PT		
DISSOLVED OXYGEN			
Make: YSI		Model: Professional plus	
Date of calibration: 18/5/23		Name of Calibrator: HW	
Span value: 70% to 130%			
Measured value: 104%			
Measured reading Acceptable (Yes/No):			
pH			
Make: YSI		Model: Professional plus	
Date of calibration: 18/5/23		Name of Calibrator: HW	
Buffer 1: Theoretical pH = 7.01± 0.01		Expiry date: June/23	Lot No: 384001
Buffer 2: Theoretical pH = 4.01± 0.01		Expiry date: May/24	Lot No: 398326
Measured reading of Buffer 1: 7.08			
Measured reading of Buffer 2: 4.09			
Slope:		Measured reading Acceptable (Yes/No):	
EC			
Make: YSI		Model: Professional plus	
Date: 18/5/23	Name of Calibrator:		Temperature: 11.3 °C
Calibration solution: Conductivity Standard		Expiry date: Sep/23	Lot No: 386922
Theoretical conductivity at temperature (see solution container):		1035	µS/cm
Measured conductivity: 1343 µS/cm		Measured reading Acceptable (Yes/No):	
REDOX			
Make: YSI		Model: Professional plus	
Date of calibration: 18/5/23		Name of Calibrator: HW	
Calibration solution: ORP Test Solution		Expiry date: Sep/27	Lot No: 8169
Theoretical redox value:	240mV		
Measured redox reading: 254.5 mV		Measured reading Acceptable (Yes/No):	

JKEnvironments

PID FIELD CALIBRATION FORM

Client:	HI c/- APP
Project:	Proposed Hospital Development
Location:	3 Osman Street, BLAYNEY, NSW
Job Number:	E35521PT

PID

Make: RAE	Model: Mini RAE	Unit: Green 3	Date of last factory calibration: 1/2/23
Date of calibration: 17/5/23		Name of Calibrator: HW	
Calibration gas: Iso-butylene		Calibration Gas Concentration: 100.0 ppm	
Measured reading: 100.3 ppm		Error in measured reading: ± 0.3 ppm	
Measured reading Acceptable (Yes/No): Yes			

PID

Make:	Model:	Unit:	Date of last factory calibration:
Date of calibration:		Name of Calibrator:	
Calibration gas: Iso-butylene		Calibration Gas Concentration: 100.0 ppm	
Measured reading: ppm		Error in measured reading: ± ppm	
Measured reading Acceptable (Yes/No):			

PID

Make:	Model:	Unit:	Date of last factory calibration:
Date of calibration:		Name of Calibrator:	
Calibration gas: Iso-butylene		Calibration Gas Concentration: 100.0 ppm	
Measured reading: ppm		Error in measured reading: ± ppm	
Measured reading Acceptable (Yes/No):			

PID

Make:	Model:	Unit:	Date of last factory calibration:
Date of calibration:		Name of Calibrator:	
Calibration gas: Iso-butylene		Calibration Gas Concentration: 100.0 ppm	
Measured reading: ppm		Error in measured reading: ± ppm	
Measured reading Acceptable (Yes/No):			

PID

Make:	Model:	Unit:	Date of last factory calibration:
Date of calibration:		Name of Calibrator:	
Calibration gas: Iso-butylene		Calibration Gas Concentration: 100.0 ppm	
Measured reading: ppm		Error in measured reading: ± ppm	
Measured reading Acceptable (Yes/No):			

JKEnvironments

Client:	HI c/- APP	**Job No.:**	E35521PT
Project:	Proposed Hospital Development	**Well No.:**	MW101
Location:	3 Osman Street, BLAYNEY, NSW	**Depth (m):**	8

WELL FINISH

x	Gatic Cover		Standpipe		Other (describe)

WELL PURGE DETAILS:

Method:	Peristaltic Pump	**SWL – Before:**	4.28
Date:	24/5/23	**Time – Before:**	10:44
Undertaken By:	OB	**Total Vol Removed:**	1.8 L
Pump Program No:	Low	**PID (ppm):**	1.2

PURGING / SAMPLING MEASUREMENTS

Time (min)	SWL (m)	Vol (L)	Notes	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
10:49 (0)	4.41	1		14.9	4.4	1319	6.55	163.7
10:55 (6)	4.41	1.2		14.5	5.6	1319	6.69	158.3
10:58 (9)	4.41	1.4		14.4	3.3	1309	6.62	157.0
11:01 (12)	4.42	1.6		14.6	3.1	1332	6.60	155.6
11:04 (15)	4.42	1.8		14.6	3.1	1335	6.58	153.4

steady state achieved – start sampling

Comments: Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)

Sampling Containers Used: 2 **x glass amber,** 4 **x BTEX vials,** 1 **x HNO3 plastic, x H2SO4 plastic,** 1 **x unpreserved plastic**

YSI used: 4 silty, light brown, moderate recharge

Tested By: Katrina Taylor / OB		**Remarks:**
Date Tested:	24/5/23	- Steady state conditions - difference in the pH less than 0.2 units, difference in conductivity less than 10% 10% and SWL stable/not in drawdown
Checked By:	KT	
Date:	30-05-23	

JKEnvironments

Client:	HI c/- APP	**Job No.:**	E35521PT
Project:	Proposed Hospital Development	**Well No.:**	MW12
Location:	3 Osman Street, BLAYNEY, NSW	**Depth (m):**	6

WELL FINISH

X	Gatic Cover		Standpipe		Other (describe)

WELL PURGE DETAILS:

Method:	Peristaltic Pump	**SWL – Before:**	3.60
Date:	24/5/23	**Time – Before:**	12:34
Undertaken By:	OB	**Total Vol Removed:**	2.1
Pump Program No:	Low	**PID (ppm):**	0.2

PURGING / SAMPLING MEASUREMENTS

Time (min)	SWL (m)	Vol (L)	Notes	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
12:43 (0)	3.77	1		14.7	5.5	872	6.92	129.7
12:46 (3)	3.79	1.3	(pump slowed)	14.9	4.8	876	6.82	129.1
12:49 (6)	3.81	1.6	(pump slowed)	15.1	4.5	886	6.76	127.4
12:52 (9)	3.83	1.8		15.2	4.5	889	6.73	126.2
12:55 (12)	3.83	2		15.3	4.2	891	6.71	125.1
12:58 (15)	3.83	2.1		15.4	4.6	897	6.68	124.2

steady state achieved - start sampling

Comments: Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)

Sampling Containers Used: 2 x glass amber, 4 x BTEX vials, 1 x HNO3 plastic, x H2SO4 plastic, 1 x unpreserved plastic

YSI used: 4

slightly silty, light brown, slow recharge

Tested By: Katrina Taylor / OB	**Remarks:**
Date Tested: 24/5/23	- Steady state conditions
Checked By: KS	- difference in the pH less than 0.2 units, difference in conductivity less than 10%
Date: 30.05.23	10% and SWL stable/not in drawdown

JKEnvironments

Client:	HI c/- APP	**Job No.:**	E35521PT
Project:	Proposed Hospital Development	**Well No.:**	MW15
Location:	3 Osman Street, BLAYNEY, NSW	**Depth (m):**	6

WELL FINISH

X	**Gatic Cover**		**Standpipe**		**Other (describe)**

WELL PURGE DETAILS:

Method:	Peristaltic Pump	**SWL – Before:**	2.48
Date:	25/5/23	**Time – Before:**	08:06
Undertaken By:	OB	**Total Vol Removed:**	2.1
Pump Program No:	Low	**PID (ppm):**	0

PURGING / SAMPLING MEASUREMENTS

Time (min)	SWL (m)	Vol (L)	Notes	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
08:18 (0)	2.63	0.5	(pump slowed)	13.2	5.0	306.0	6.54	171.8
08:21 (3)	2.69	0.8		12.9	3.9	300.0	6.40	169.1
08:24 (6)	2.71	1.1		12.6	3.3	298.3	6.27	169.6
08:27 (9)	2.74	1.4		12.6	3.1	297.4	6.17	170.1
08:30 (12)	2.74	1.7		12.1	3.1	292.8	6.10	170.7
08:33 (15)	2.75	1.9		11.8	3.1	291.8	6.07	170.4
08:36 (18)	2.75	2.1		11.7	3.1	290.3	6.06	170.2

Steady state achieved - start sampling

Comments: Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)

Sampling Containers Used: 2 **x glass amber,** 4 **x BTEX vials,** 1 **x HNO3 plastic, x H2SO4 plastic,** 1 **x unpreserved plastic**

YSI used: 4 low silt, clear, slow recharge

Tested By: Katrina Taylor / OB		**Remarks:**
Date Tested:	25/5/23	- Steady state conditions
Checked By:	KT	- difference in the pH less than 0.2 units, difference in conductivity less than 10%
Date:	30.05.23	10% and SWL stable/not in drawdown

JKEnvironments

Client:	HI c/- APP	**Job No.:**	E35521PT
Project:	Proposed Hospital Development	**Well No.:**	MW14
Location:	3 Osman Street, BLAYNEY, NSW	**Depth (m):**	6

WELL FINISH

x	Gatic Cover		Standpipe		Other (describe)

WELL PURGE DETAILS:

Method:	Peristaltic Pump	**SWL – Before:**	3.0
Date:	25/5/23	**Time – Before:**	09.47
Undertaken By:	OB	**Total Vol Removed:**	2.15
Pump Program No:	Low	**PID (ppm):**	0.1

PURGING / SAMPLING MEASUREMENTS

Time (min)	SWL (m)	Vol (L)	Notes	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
09.52 (0)	3.28	1	(pump slowed)	18.0	6.8	1300	6.11	179.4
09.55 (3)	3.33	1.3	(pump slowed)	17.0	5.6	1315	6.40	176.1
09:58 (6)	3.36	1.5		17.0	2.6	1331	6.65	170.1
10:01 (9)	3.40	1.8	(pump slowed)	17.4	3.0	1334	6.78	165.3
10:04 (12)	3.40	2		17.4	2.1	1362	6.82	162.4
10.07 (15)	3.40	2.15		17.6	2.5	1380	6.85	158.8

Steady state achieved – start sampling

Comments: Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)

Sampling Containers Used: 2 **x glass amber,** 4 **x BTEX vials,** 1 **x HNO3 plastic, x H2SO4 plastic,** 1 **x unpreserved plastic**

YSI used: 4 low silty load, slow recharge

Tested By: Katrina Taylor / OB	**Remarks:**
Date Tested: 25/5/23	- Steady state conditions
Checked By: KT	- difference in the pH less than 0.2 units, difference in conductivity less than 10%
Date: 30.05.23	10% and SWL stable/not in drawdown

JKEnvironments

Client:	HI c/- APP	**Job No.:**	E35521PT
Project:	Proposed Hospital Development	**Well No.:**	MW116
Location:	3 Osman Street, BLAYNEY, NSW	**Depth (m):**	8

WELL FINISH

X	Gatic Cover		Standpipe		Other (describe)

WELL PURGE DETAILS:

Method:	Peristaltic Pump	**SWL – Before:**	3.16
Date:	24/5/23	**Time – Before:**	08:09
Undertaken By:	OB	**Total Vol Removed:**	2.20
Pump Program No:	Low	**PID (ppm):**	1.4

PURGING / SAMPLING MEASUREMENTS

Time (min)	SWL (m)	Vol (L)	Notes	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
08:22 (0)	3.30	1		13.1	3.8	166.9	6.21	157.6
08:33 (11)	3.30	1.15	(pump issue)	7.3	13.6	81.9	6.15	164.0
08:36 (14)	3.30	1.30		13.1	2.7	171.9	6.10	162.6
08:39 (17)	3.35	1.45	(pump slowed)	13.4	2.0	177.2	6.01	161.8
08:42 (20)	3.38	1.60	(pump slowed)	13.4	3.6	176.4	5.96	160.3
08:45 (23)	3.39	1.75		12.0	1.9	170.3	5.98	157.4
08:48 (26)	3.40	1.90		12.2	1.8	171.2	5.99	157.0
08:51 (29)	3.40	2.05		12.2	1.7	171.8	5.96	158.9
08:54 (32)	3.40	2.20		12.1	1.7	171.5	5.96	158.8

steady state achieved - start sampling

Comments: Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)

Sampling Containers Used: 4 x glass amber, 8 x BTEX vials, 2 x HNO3 plastic, x H2SO4 plastic, 2 x unpreserved plastic

YSI used: 4 silty, light brown, slow recharge GWDUP2

Tested By: Katrina Taylor	**Remarks:**
Date Tested: 24/5/23	- Steady state conditions
Checked By: KT	- difference in the pH less than 0.2 units, difference in conductivity less than 10%
Date: 30.05.23	10% and SWL stable/not in drawdown

JKEnvironments

Client:	HI c/- APP	**Job No.:**	E35521PT
Project:	Proposed Hospital Development	**Well No.:**	MW117
Location:	3 Osman Street, BLAYNEY, NSW	**Depth (m):**	8

WELL FINISH

x	Gatic Cover		Standpipe		Other (describe)

WELL PURGE DETAILS:

Method:	Peristaltic Pump	**SWL – Before:**	2.81
Date:	23/5/23	**Time – Before:**	14:08
Undertaken By:	OB	**Total Vol Removed:**	1.60
Pump Program No:	Low	**PID (ppm):**	0.7

PURGING / SAMPLING MEASUREMENTS

Time (min)	SWL (m)	Vol (L)	Notes	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
14.38 (0)	2.97	1		16.1	5.4	304.0	5.80	209.2
14.41 (3)	2.99	1.15		15.7	5.2	235.5	5.78	200.8
14.44 (6)	3.01	1.30		15.9	4.2	235.5	5.71	185.6
14:47 (9)	3.01	1.45		15.4	4.3	243.4	5.65	188.0
14.50 (12)	3.01	1.60		15.1	5.4	235.6	5.57	185.2

steady state achieved - start sampling

Comments: Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)

Sampling Containers Used: 4 x glass amber, 8 x BTEX vials, 1 x HNO3 plastic, x H2SO4 plastic, 2 x unpreserved plastic

YSI used: 4 slow recharge, slightly silty, GWDUP1

Tested By: Katrina Taylor / OB	**Remarks:**
Date Tested: 23/05/23	- Steady state conditions
Checked By: KT	- difference in the pH less than 0.2 units, difference in conductivity less than 10%
Date: 30.05.23	10% and SWL stable/not in drawdown

JKEnvironments

WATER QUALITY METER CALIBRATION FORM

Client:	HI c/- APP		
Project:	Proposed Hospital Development		
Location:	3 Osman Street, BLAYNEY, NSW		
Job Number:	E35521PT		
DISSOLVED OXYGEN			
Make: YSI		Model: 4	
Date of calibration: 23/5/23		Name of Calibrator: OB	
Span value: 70% to 130%			
Measured value: 100 %			
Measured reading Acceptable (Yes/No): Yes			
pH			
Make: YSI		Model: 4	
Date of calibration: 23/5/23		Name of Calibrator: OB	
Buffer 1: Theoretical pH = 7.01± 0.01		Expiry date: 08/24	Lot No: 393113
Buffer 2: Theoretical pH = 4.01± 0.01		Expiry date: 05/24	Lot No: CD030223
Measured reading of Buffer 1: 6.50			
Measured reading of Buffer 2: 4.01			
Slope:		Measured reading Acceptable (Yes/No): Yes	
EC			
Make: YSI		Model: 4	
Date: 23/5/23	Name of Calibrator: OB		Temperature: 18 °C
Calibration solution: AR		Expiry date: 02/25	Lot No: 1C19548
Theoretical conductivity at temperature (see solution container): 1224 µS/cm			
Measured conductivity: 1263 µS/cm		Measured reading Acceptable (Yes/No): Yes	
REDOX			
Make: YSI		Model: 4	
Date of calibration: 23/5/23		Name of Calibrator: OB	
Calibration solution: ORP		Expiry date: 09/27	Lot No: 8169
Theoretical redox value: 240mV			
Measured redox reading: 240.0 mV		Measured reading Acceptable (Yes/No): Yes	

JKEnvironments

PID FIELD CALIBRATION FORM

Client:	HI c/- APP		
Project:	Proposed Hospital Development		
Location:	3 Osman Street, BLAYNEY, NSW		
Job Number:	E35521PT		
PID			
Make: RAE	Model: MINIRAELITE +	Unit: 4	Date of last factory calibration: 12/1/23
Date of calibration: 23/5/23		Name of Calibrator: OB	
Calibration gas: Iso-butylene		Calibration Gas Concentration: 100.0 ppm	
Measured reading: 100.1 ppm		Error in measured reading: ± 0.1 ppm	
Measured reading Acceptable (Yes/No): Yes			
PID			
Make: RAE	Model: MINIRAELITE +	Unit: 4	Date of last factory calibration: 12/1/23
Date of calibration: 24/5/23		Name of Calibrator: OB	
Calibration gas: Iso-butylene		Calibration Gas Concentration: 100.0 ppm	
Measured reading: 100.3 ppm		Error in measured reading: ± 0.3 ppm	
Measured reading Acceptable (Yes/No): yes			
PID			
Make:	Model:	Unit:	Date of last factory calibration:
Date of calibration:		Name of Calibrator:	
Calibration gas: Iso-butylene		Calibration Gas Concentration: 100.0 ppm	
Measured reading: ppm		Error in measured reading: ± ppm	
Measured reading Acceptable (Yes/No):			
PID			
Make:	Model:	Unit:	Date of last factory calibration:
Date of calibration:		Name of Calibrator:	
Calibration gas: Iso-butylene		Calibration Gas Concentration: 100.0 ppm	
Measured reading: ppm		Error in measured reading: ± ppm	
Measured reading Acceptable (Yes/No):			
PID			
Make:	Model:	Unit:	Date of last factory calibration:
Date of calibration:		Name of Calibrator:	
Calibration gas: Iso-butylene		Calibration Gas Concentration: 100.0 ppm	
Measured reading: ppm		Error in measured reading: ± ppm	
Measured reading Acceptable (Yes/No):			

Appendix H: UCL Calculation Sheets

JKEnvironments

FILL DATA USED FOR 95% UCL CALCULATIONS
All data in mg/kg unless stated otherwise

			HEAVY METALS				
			Arsenic	Chromium (total or VI)	Chromium (total)	Lead	Nickel
PQL - Envirolab Services			4	1	1	1	1
Sample Reference	**Sample Depth**	**Sample Description**	Max concentration for primary/duplicate adopted				
BH1	0.05-0.2	F: Clayey sand	<4	**10**	**10**	**2**	**3**
BH1	0.5-0.8	F: Gravelly clayey sand	<4	**270**	**270**	**2**	**220**
BH3	0-0.1	F: Silty clay	**9**	**53**	**53**	**18**	**14**
BH3	0.4-0.65	F: Silty clay	**17**	**30**	**30**	**260**	**15**
BH5	0-0.1	F: Silt	<4	**19**	**19**	**40**	**7**
BH6	0-0.1	F: Silty clay	<4	**26**	**26**	**11**	**7**
BH10	0-0.2	F: Silty clay	<4	**21**	**21**	**16**	**10**
BH14	0-0.1	F: Silty clay	**12**	**32**	**32**	**20**	**7**
BH15	0-0.1	F: Silty clay	**4**	**29**	**29**	**17**	**7**
BH17	0.05-0.2	F: Clayey sand	<4	**23**	**23**	**2**	**3**
BH20	0.05-0.2	F: Clayey sand	<4	**33**	**33**	**3**	**6**
BH20	0.5-0.7	F: Gravelly sand	**12**	**360**	**360**	**2**	**310**
BH101	0-0.1	F: Silty Clay	**7**	**59**	**59**	**26**	**15**
BH102	0-0.2	F: Silty Clay	<4	**39**	**39**	**14**	**12**
BH103	0-0.2	F: Silty Clay	**5**	**51**	**51**	**16**	**14**
BH104	0-0.2	F: Silty Clay	<4	**33**	**33**	**11**	**8**
BH105	0-0.2	F: Silty Clay	<4	**13**	**13**	**47**	**6**
BH106	0-0.2	F: Silty Clay	<4	**39**	**39**	**13**	**7**
BH107	0.01-0.46	F: Silty Clayey Sand	<4	**27**	**27**	**3**	**14**
BH108	0-0.2	F: Silty Clay	**4**	**14**	**14**	**23**	**6**
BH109	0-0.2	F: Silty Clay	**26**	**17**	**17**	**37**	**11**
BH110	0-0.2	F: Silty Clay	<4	**42**	**42**	**13**	**7**
BH111	0-0.2	F: Silty Clay	**10**	**45**	**45**	**20**	**20**
BH112	0-0.2	F: Silty Clay	**79**	**66**	**66**	**64**	**52**
BH113	0-0.1	F: Silty Clay	**120**	**43**	**43**	**55**	**11**
BH113	0.1-0.45	F: Silty Clay	<4	NA	NA	NA	NA
BH114	0-0.2	F: Silty Clay	**4**	**20**	**20**	**10**	**7**
BH115	0.01-0.2	F: Gravelly Clay	<4	**34**	**34**	**5**	**20**
BH116	0.015-0.45	F: Gravelly Clay	**10**	**120**	**250**	**6**	**110**
BH117	0.01-0.4	F: Gravelly Clay	**10**	**2**	**280**	**5**	**130**
BH117	0.7-0.95	F: Gravelly Clay	<4	**37**	**37**	**22**	**6**
BH118	0-0.2	F: Silty Clay	<4	**15**	**15**	**16**	**5**
BH119	0-0.2	F: Silty Clay	<4	**33**	**33**	**21**	**8**
BH120	0-0.1	F: Silty Clay	**6**	**61**	**61**	**18**	**6**
BH121	0-0.1	F: Silty Clay	**85**	**31**	**31**	**53**	**14**
BH122	0.03-0.4	F: Gravelly Sand	<4	**7**	**7**	**2**	**2**
SV1	0.5-0.8	F: Silty Sand	**9**	**39**	**39**	**9**	**12**

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.121/06/2023 11:43:16 AM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic

General Statistics

Total Number of Observations	37	Number of Distinct Observations	12
Number of Detects	18	Number of Non-Detects	19
Number of Distinct Detects	12	Number of Distinct Non-Detects	1
Minimum Detect	4	Minimum Non-Detect	4
Maximum Detect	120	Maximum Non-Detect	4
Variance Detects	1148	Percent Non-Detects	51.35%
Mean Detects	23.83	SD Detects	33.88
Median Detects	10	CV Detects	1.422
Skewness Detects	2.089	Kurtosis Detects	3.373
Mean of Logged Detects	2.526	SD of Logged Detects	1.052

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.61	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.897	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.359	Lilliefors GOF Test
5% Lilliefors Critical Value	0.202	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	13.65	KM Standard Error of Mean	4.231
KM SD	25.01	95% KM (BCA) UCL	21.38
95% KM (t) UCL	20.79	95% KM (Percentile Bootstrap) UCL	21.27
95% KM (z) UCL	20.61	95% KM Bootstrap t UCL	25.23
90% KM Chebyshev UCL	26.34	95% KM Chebyshev UCL	32.09
97.5% KM Chebyshev UCL	40.07	99% KM Chebyshev UCL	55.75

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.821	Anderson-Darling GOF Test
5% A-D Critical Value	0.771	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.308	Kolmogorov-Smirnov GOF
5% K-S Critical Value	0.21	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.906	k star (bias corrected MLE)	0.792
Theta hat (MLE)	26.32	Theta star (bias corrected MLE)	30.1
nu hat (MLE)	32.6	nu star (bias corrected)	28.5
Mean (detects)	23.83		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

	A–E	F	G–K	L
58	Minimum	0.01	Mean	11.6
59	Maximum	120	Median	0.01
60	SD	26.23	CV	2.261
61	k hat (MLE)	0.204	k star (bias corrected MLE)	0.206
62	Theta hat (MLE)	56.73	Theta star (bias corrected MLE)	56.34
63	nu hat (MLE)	15.13	nu star (bias corrected)	15.24
64	Adjusted Level of Significance (β)	0.0431		
65	Approximate Chi Square Value (15.24, α)	7.427	Adjusted Chi Square Value (15.24, β)	7.19
66	95% Gamma Approximate UCL (use when n>=50)	23.8	95% Gamma Adjusted UCL (use when n<50)	24.58
67				
68	**Estimates of Gamma Parameters using KM Estimates**			
69	Mean (KM)	13.65	SD (KM)	25.01
70	Variance (KM)	625.7	SE of Mean (KM)	4.231
71	k hat (KM)	0.298	k star (KM)	0.292
72	nu hat (KM)	22.03	nu star (KM)	21.58
73	theta hat (KM)	45.84	theta star (KM)	46.8
74	80% gamma percentile (KM)	20.78	90% gamma percentile (KM)	40.39
75	95% gamma percentile (KM)	63	99% gamma percentile (KM)	122
76				
77	**Gamma Kaplan-Meier (KM) Statistics**			
78	Approximate Chi Square Value (21.58, α)	12.02	Adjusted Chi Square Value (21.58, β)	11.71
79	95% Gamma Approximate KM-UCL (use when n>=50)	24.5	95% Gamma Adjusted KM-UCL (use when n<50)	25.15
80				
81	**Lognormal GOF Test on Detected Observations Only**			
82	Shapiro Wilk Test Statistic	0.856	**Shapiro Wilk GOF Test**	
83	5% Shapiro Wilk Critical Value	0.897	Detected Data Not Lognormal at 5% Significance Level	
84	Lilliefors Test Statistic	0.238	**Lilliefors GOF Test**	
85	5% Lilliefors Critical Value	0.202	Detected Data Not Lognormal at 5% Significance Level	
86	Detected Data Not Lognormal at 5% Significance Level			
87				
88	**Lognormal ROS Statistics Using Imputed Non-Detects**			
89	Mean in Original Scale	12.09	Mean in Log Scale	1.007
90	SD in Original Scale	26.01	SD in Log Scale	1.821
91	95% t UCL (assumes normality of ROS data)	19.31	95% Percentile Bootstrap UCL	19.86
92	95% BCA Bootstrap UCL	22.05	95% Bootstrap t UCL	25.35
93	95% H-UCL (Log ROS)	41.16		
94				
95	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**			
96	KM Mean (logged)	1.941	KM Geo Mean	6.964
97	KM SD (logged)	0.912	95% Critical H Value (KM-Log)	2.292
98	KM Standard Error of Mean (logged)	0.154	95% H-UCL (KM -Log)	14.96
99	KM SD (logged)	0.912	95% Critical H Value (KM-Log)	2.292
100	KM Standard Error of Mean (logged)	0.154		
101				
102	**DL/2 Statistics**			
103	**DL/2 Normal**		**DL/2 Log-Transformed**	
104	Mean in Original Scale	12.62	Mean in Log Scale	1.585
105	SD in Original Scale	25.78	SD in Log Scale	1.177
106	95% t UCL (Assumes normality)	19.78	95% H-Stat UCL	16.23
107	DL/2 is not a recommended method, provided for comparisons and historical reasons			
108				
109	**Nonparametric Distribution Free UCL Statistics**			
110	Data do not follow a Discernible Distribution at 5% Significance Level			
111				
112	**Suggested UCL to Use**			
113	95% KM (Chebyshev) UCL	32.09		
114				

	A	B	C	D	E	F	G	H	I	J	K	L
115	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
116	Recommendations are based upon data size, data distribution, and skewness.											
117	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
118	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
119												

UCL Statistics for Data Sets with Non-Detects			
User Selected Options			
Date/Time of Computation	ProUCL 5.121/06/2023 1:08:38 PM		
From File	WorkSheet.xls		
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		
ChromiumCrVIT			
General Statistics			
Total Number of Observations	36	Number of Distinct Observations	32
		Number of Missing Observations	0
Minimum	2	Mean	49.81
Maximum	360	Median	33
SD	69.38	Std. Error of Mean	11.56
Coefficient of Variation	1.393	Skewness	3.649
Normal GOF Test			
Shapiro Wilk Test Statistic	0.509	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.935	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.325	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.145	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	69.34	95% Adjusted-CLT UCL (Chen-1995)	76.34
		95% Modified-t UCL (Johnson-1978)	70.51
Gamma GOF Test			
A-D Test Statistic	2.093	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.771	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.202	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.15	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	1.252	k star (bias corrected MLE)	1.166
Theta hat (MLE)	39.77	Theta star (bias corrected MLE)	42.7
nu hat (MLE)	90.17	nu star (bias corrected)	83.99
MLE Mean (bias corrected)	49.81	MLE Sd (bias corrected)	46.11
		Approximate Chi Square Value (0.05)	63.87
Adjusted Level of Significance	0.0428	Adjusted Chi Square Value	63.07
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	65.5	95% Adjusted Gamma UCL (use when n<50)	66.33
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.931	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.935	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.129	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.145	Data appear Lognormal at 5% Significance Level	
Data appear Approximate Lognormal at 5% Significance Level			

	A–E	F	G–K	L
58	Lognormal Statistics			
59	Minimum of Logged Data	0.693	Mean of logged Data	3.458
60	Maximum of Logged Data	5.886	SD of logged Data	0.911
61				
62	Assuming Lognormal Distribution			
63	95% H-UCL	68.39	90% Chebyshev (MVUE) UCL	71.88
64	95% Chebyshev (MVUE) UCL	82.99	97.5% Chebyshev (MVUE) UCL	98.4
65	99% Chebyshev (MVUE) UCL	128.7		
66				
67	Nonparametric Distribution Free UCL Statistics			
68	Data appear to follow a Discernible Distribution at 5% Significance Level			
69				
70	Nonparametric Distribution Free UCLs			
71	95% CLT UCL	68.82	95% Jackknife UCL	69.34
72	95% Standard Bootstrap UCL	68.71	95% Bootstrap-t UCL	114.4
73	95% Hall's Bootstrap UCL	159.5	95% Percentile Bootstrap UCL	70.86
74	95% BCA Bootstrap UCL	78.14		
75	90% Chebyshev(Mean, Sd) UCL	84.49	95% Chebyshev(Mean, Sd) UCL	100.2
76	97.5% Chebyshev(Mean, Sd) UCL	122	99% Chebyshev(Mean, Sd) UCL	164.9
77				
78	Suggested UCL to Use			
79	95% H-UCL	68.39		
80				
81	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
82	Recommendations are based upon data size, data distribution, and skewness.			
83	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			
84	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.			
85				
86	ProUCL computes and outputs H-statistic based UCLs for historical reasons only.			
87	H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.			
88	It is therefore recommended to avoid the use of H-statistic based 95% UCLs.			
89	Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.			
90				

	A	B	C	D	E	F	G	H	I	J	K	L
1	UCL Statistics for Data Sets with Non-Detects											
2												
3	User Selected Options											
4	Date/Time of Computation			ProUCL 5.121/06/2023 1:06:43 PM								
5	From File			WorkSheet.xls								
6	Full Precision			OFF								
7	Confidence Coefficient			95%								
8	Number of Bootstrap Operations			2000								
9												
10												
11	ChromiumT											
12												

General Statistics			
Total Number of Observations	36	Number of Distinct Observations	32
		Number of Missing Observations	0
Minimum	7	Mean	61.14
Maximum	360	Median	33
SD	84.46	Std. Error of Mean	14.08
Coefficient of Variation	1.381	Skewness	2.597

Normal GOF Test			
Shapiro Wilk Test Statistic	0.546	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.935	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.366	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.145	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			

Assuming Normal Distribution			
95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	84.92	95% Adjusted-CLT UCL (Chen-1995)	90.8
		95% Modified-t UCL (Johnson-1978)	85.94

Gamma GOF Test			
A-D Test Statistic	3.308	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.773	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.246	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.151	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics			
k hat (MLE)	1.144	k star (bias corrected MLE)	1.067
Theta hat (MLE)	53.45	Theta star (bias corrected MLE)	57.3
nu hat (MLE)	82.36	nu star (bias corrected)	76.83
MLE Mean (bias corrected)	61.14	MLE Sd (bias corrected)	59.19
		Approximate Chi Square Value (0.05)	57.64
Adjusted Level of Significance	0.0428	Adjusted Chi Square Value	56.88

Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	81.5	95% Adjusted Gamma UCL (use when n<50)	82.58

Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.893	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.935	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.165	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.145	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			

58	Lognormal Statistics			
59	Minimum of Logged Data	1.946	Mean of logged Data	3.616
60	Maximum of Logged Data	5.886	SD of logged Data	0.89
61				
62	Assuming Lognormal Distribution			
63	95% H-UCL	77.69	90% Chebyshev (MVUE) UCL	81.88
64	95% Chebyshev (MVUE) UCL	94.31	97.5% Chebyshev (MVUE) UCL	111.6
65	99% Chebyshev (MVUE) UCL	145.4		
66				
67	Nonparametric Distribution Free UCL Statistics			
68	Data do not follow a Discernible Distribution (0.05)			
69				
70	Nonparametric Distribution Free UCLs			
71	95% CLT UCL	84.29	95% Jackknife UCL	84.92
72	95% Standard Bootstrap UCL	83.48	95% Bootstrap-t UCL	101.8
73	95% Hall's Bootstrap UCL	81.9	95% Percentile Bootstrap UCL	87.03
74	95% BCA Bootstrap UCL	93.03		
75	90% Chebyshev(Mean, Sd) UCL	103.4	95% Chebyshev(Mean, Sd) UCL	122.5
76	97.5% Chebyshev(Mean, Sd) UCL	149	99% Chebyshev(Mean, Sd) UCL	201.2
77				
78	Suggested UCL to Use			
79	95% Chebyshev (Mean, Sd) UCL	122.5		
80				
81	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
82	Recommendations are based upon data size, data distribution, and skewness.			
83	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			
84	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.			
85				

UCL Statistics for Uncensored Full Data Sets

User Selected Options	
Date/Time of Computation	ProUCL 5.121/06/2023 12:05:00 PM
From File	WorkSheet_b.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Lead

General Statistics			
Total Number of Observations	36	Number of Distinct Observations	24
		Number of Missing Observations	0
Minimum	2	Mean	25.06
Maximum	260	Median	16
SD	43.37	Std. Error of Mean	7.228
Coefficient of Variation	1.731	Skewness	4.809
Normal GOF Test			
Shapiro Wilk Test Statistic	0.468	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.935	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.297	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.145	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	37.27	95% Adjusted-CLT UCL (Chen-1995)	43.13
		95% Modified-t UCL (Johnson-1978)	38.23
Gamma GOF Test			
A-D Test Statistic	1.003	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.782	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.167	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.152	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	0.882	k star (bias corrected MLE)	0.827
Theta hat (MLE)	28.41	Theta star (bias corrected MLE)	30.3
nu hat (MLE)	63.5	nu star (bias corrected)	59.55
MLE Mean (bias corrected)	25.06	MLE Sd (bias corrected)	27.55
		Approximate Chi Square Value (0.05)	42.8
Adjusted Level of Significance	0.0428	Adjusted Chi Square Value	42.16
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	34.86	95% Adjusted Gamma UCL (use when n<50)	35.39
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.945	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.935	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.114	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.145	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			

	A–E	F	G–K	L
58	Lognormal Statistics			
59	Minimum of Logged Data	0.693	Mean of logged Data	2.557
60	Maximum of Logged Data	5.561	SD of logged Data	1.149
61				
62	Assuming Lognormal Distribution			
63	95% H-UCL	40.97	90% Chebyshev (MVUE) UCL	40.9
64	95% Chebyshev (MVUE) UCL	48.45	97.5% Chebyshev (MVUE) UCL	58.94
65	99% Chebyshev (MVUE) UCL	79.53		
66				
67	Nonparametric Distribution Free UCL Statistics			
68	Data appear to follow a Discernible Distribution at 5% Significance Level			
69				
70	Nonparametric Distribution Free UCLs			
71	95% CLT UCL	36.94	95% Jackknife UCL	37.27
72	95% Standard Bootstrap UCL	36.86	95% Bootstrap-t UCL	56.41
73	95% Hall's Bootstrap UCL	82.18	95% Percentile Bootstrap UCL	38.64
74	95% BCA Bootstrap UCL	47.08		
75	90% Chebyshev(Mean, Sd) UCL	46.74	95% Chebyshev(Mean, Sd) UCL	56.56
76	97.5% Chebyshev(Mean, Sd) UCL	70.19	99% Chebyshev(Mean, Sd) UCL	96.97
77				
78	Suggested UCL to Use			
79	95% H-UCL	40.97		
80				
81	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
82	Recommendations are based upon data size, data distribution, and skewness.			
83	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			
84	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.			
85				
86	ProUCL computes and outputs H-statistic based UCLs for historical reasons only.			
87	H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.			
88	It is therefore recommended to avoid the use of H-statistic based 95% UCLs.			
89	Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.			
90				

UCL Statistics for Uncensored Full Data Sets			
User Selected Options			
Date/Time of Computation	ProUCL 5.121/06/2023 12:09:09 PM		
From File	WorkSheet_c.xls		
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		
Nickel			
General Statistics			
Total Number of Observations	36	Number of Distinct Observations	17
		Number of Missing Observations	0
Minimum	2	Mean	30.89
Maximum	310	Median	9
SD	64.41	Std. Error of Mean	10.74
Coefficient of Variation	2.085	Skewness	3.355
Normal GOF Test			
Shapiro Wilk Test Statistic	0.457	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.935	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.428	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.145	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	49.03	95% Adjusted-CLT UCL (Chen-1995)	54.96
		95% Modified-t UCL (Johnson-1978)	50.03
Gamma GOF Test			
A-D Test Statistic	4.841	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.797	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.341	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.154	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	0.654	k star (bias corrected MLE)	0.618
Theta hat (MLE)	47.21	Theta star (bias corrected MLE)	49.96
nu hat (MLE)	47.11	nu star (bias corrected)	44.51
MLE Mean (bias corrected)	30.89	MLE Sd (bias corrected)	39.28
		Approximate Chi Square Value (0.05)	30.21
Adjusted Level of Significance	0.0428	Adjusted Chi Square Value	29.67
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	45.51	95% Adjusted Gamma UCL (use when n<50)	46.33
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.837	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.935	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.232	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.145	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			

58	**Lognormal Statistics**			
59	Minimum of Logged Data	0.693	Mean of logged Data	2.498
60	Maximum of Logged Data	5.737	SD of logged Data	1.135
61				
62	**Assuming Lognormal Distribution**			
63	95% H-UCL	37.71	90% Chebyshev (MVUE) UCL	37.79
64	95% Chebyshev (MVUE) UCL	44.71	97.5% Chebyshev (MVUE) UCL	54.31
65	99% Chebyshev (MVUE) UCL	73.18		
66				
67	**Nonparametric Distribution Free UCL Statistics**			
68	Data do not follow a Discernible Distribution (0.05)			
69				
70	**Nonparametric Distribution Free UCLs**			
71	95% CLT UCL	48.55	95% Jackknife UCL	49.03
72	95% Standard Bootstrap UCL	47.9	95% Bootstrap-t UCL	74.92
73	95% Hall's Bootstrap UCL	59.55	95% Percentile Bootstrap UCL	49.47
74	95% BCA Bootstrap UCL	56.14		
75	90% Chebyshev(Mean, Sd) UCL	63.1	95% Chebyshev(Mean, Sd) UCL	77.68
76	97.5% Chebyshev(Mean, Sd) UCL	97.93	99% Chebyshev(Mean, Sd) UCL	137.7
77				
78	**Suggested UCL to Use**			
79	95% Chebyshev (Mean, Sd) UCL	77.68		
80				
81	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
82	Recommendations are based upon data size, data distribution, and skewness.			
83	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			
84	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.			
85				

Appendix I: Guidelines and Reference Documents

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

Canadian Council of Ministers of the Environment, (1999). Canadian soil quality guidelines for the protection of environmental and human health: Benzo(a)Pyrene (1997)

CRC Care, (2011). Technical Report No. 10 – Health screening levels for hydrocarbons in soil and groundwater Part 1: Technical development document

Contaminated Land Management Act 1997 (NSW)

Department of Land and Water Conservation, (1997). 1:25,000 Acid Sulfate Soil Risk Map Series

Managing Land Contamination, Planning Guidelines SEPP55 – Remediation of Land (1998)

National Health and Medical Research Council (NHMRC), (2021). National Water Quality Management Strategy, Australian Drinking Water Guidelines 2011

NSW Department of Environment and Conservation, (2007). Guidelines for the Assessment and Management of Groundwater Contamination

NSW EPA, (2014). Waste Classification Guidelines - Part 1: Classifying Waste

NSW EPA, (2015). Guidelines on the Duty to Report Contamination under Section 60 of the CLM Act 1997

NSW EPA, (2017). Guidelines for the NSW Site Auditor Scheme, 3rd Edition

NSW EPA, (2020). Consultants Reporting on Contaminated Land, Contaminated Land Guidelines

NSW EPA, (2022). *Sampling design part 1 - application*, Contaminated Land Guidelines

National Environment Protection Council (NEPC), (2013). National Environmental Protection (Assessment of Site Contamination) Measure 1999 as amended (2013)

Olszowy, H., Torr, P., and Imray, P., (1995). Trace Element Concentrations in Soils from Rural and Urban Areas of Australia. Contaminated Sites Monograph Series No. 4. Department of Human Services and Health, Environment Protection Agency, and South Australian Health Commission

Protection of the Environment Operations Act 1997 (NSW)

State Environmental Planning Policy (Resilience and Hazards) 2021 (NSW)

U.S. Environmental Protection Agency, (1999). Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air Second Edition Compendium Method TO-15 Determination Of Volatile Organic Compounds (VOCs) In Air Collected In Specially-Prepared Canisters And Analysed By Gas Chromatography/ Mass Spectrometry (GC/MS).

World Health Organisation (WHO), (2008). Petroleum Products in Drinking-water, Background document for the development of WHO Guidelines for Drinking Water Quality

Western Australia Department of Health, (2021). Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia