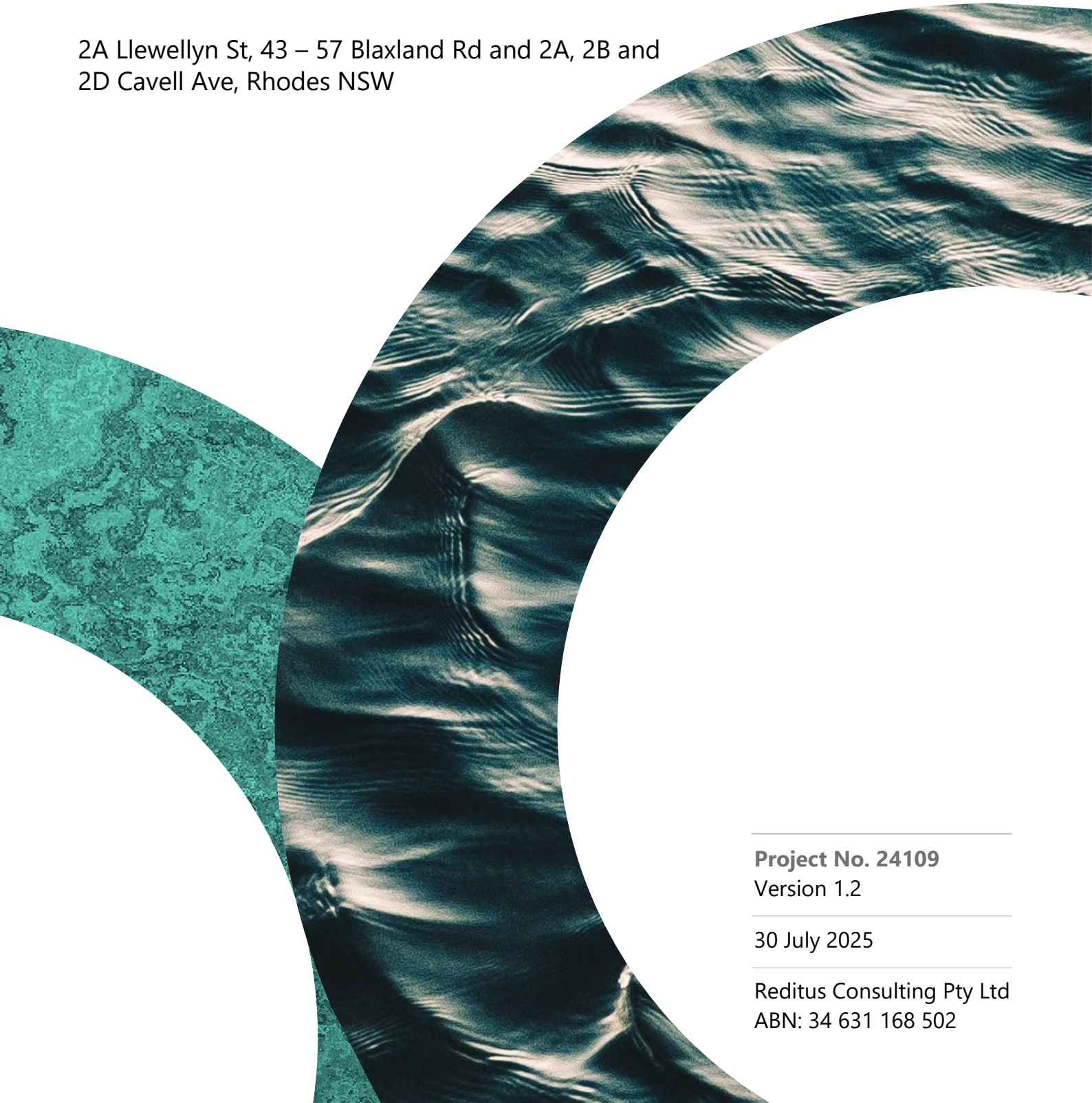
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Acid Sulfate Soil Management Plan

2A Llewellyn St, 43 – 57 Blaxland Rd and 2A, 2B and 2D Cavell Ave, Rhodes NSW



Project No. 24109
Version 1.2

30 July 2025

Reditus Consulting Pty Ltd
ABN: 34 631 168 502

Acid Sulfate Soil Management Plan

2A Llewellyn St, 43 – 57 Blaxland Rd and 2A, 2B and 2D Cavell Ave, Rhodes NSW

DOCUMENT CONTROL

Prepared by	**Tanner Graham** Environmental Scientist	
Reviewed by	**Ashley Barber** Principal Environmental Engineer CEnvP SCP: SC41210	
Authorised by	**Dean Stafford** Director | Principal Environmental Scientist	

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Executive Summary

This Acid Sulfate Soils Management Plan (ASSMP) has been prepared by Reditus Consulting Pty Ltd (Reditus) to accompany a detailed State Significant Development Application (SSDA) for the in-fill affordable housing development at 43 – 57 Blaxland Road, 2A, 2B and 2D Cavell Avenue, 448-458 Concord Road and 2A Lewellyn Street, Rhodes. The legal description is outlined in **Table 1**.

Table 1 Legal Description of the Site

PROPERTY ADDRESS	TITLE DESCRIPTION
43B – 57 Blaxland Road, Rhodes **2A, 2B and 2D Cavell Avenue, Rhodes** **448-458 Concord Road, Rhodes** **2A Lewellyn Street, Rhodes**	Blaxland Road - Lot A in DP 348494, Lot A in DP 350757, Lot B in DP 350757, Lot C in DP 350757, Lot 29 in DP 5923, Lot 1 in DP 874487, Lot 2 in DP 874487, Lot 2 in DP 218467, Lot 1 in DP 218467, Lot A in DP 339030, Lot 25 in DP 5923 Cavell Ave - Lot 3 in DP 310311, Lot 480 in DP 816840, Lot 481 in DP 816840 Concord Road - Lot 3 in DP 805684, Lot 2 in DP 805684, Lot 12 in DP 792101, Lot 13 in DP 792101, Lot 14 in DP 792101, Lot 15 in DP 792101, Lot 16 in DP 792101, Lot 2 in DP 310311 Lewellyn Street - Lot B in DP 348494
Site Area	14,380sqm

This report has been prepared to address the Secretary's Environmental Assessment Requirements (**SEARs**) issued for the project (SSD-67508739). This report concludes that the proposed development is suitable from an acid sulfate soil perspective pending the data obtained during the additional sampling recommended in **Section 4**.

Following the implementation of the above mitigation measures, the remaining impacts are appropriate.

1 Introduction

The application seeks consent for the development of an infill affordable housing development that is a result of an Architectural Design Competition that was undertaken in mid 2024, which resulted in a high-quality urban design outcome that aligns with the desired future character of the Rhodes Precinct. Specifically, the SSDA seeks consent for:

- Site preparation works including demolition and removal of existing structures on the site, tree and vegetation removal.
- Bulk excavation to accommodate the basement structure and site remediation.
- Construction of seven (7) residential buildings comprising two (2) townhouse buildings ranging from four (4) to five (5) storeys (plus roof terrace), and five (5) residential flat buildings ranging from eight (8) to 29 storeys
- Together these buildings comprise:
  - Nine (9) townhouses and 640 apartments comprising 15% affordable housing
  - Basement parking for private vehicles, visitors and service vehicles.
  - Storage areas and services.
  - Communal open spaces.
- Construction of a public road connecting Blaxland Road and Cavell Avenue
- Associated landscaping and public domain improvements

The purpose of this project is to facilitate the growth of residential development and affordable housing within the Rhodes precinct that aligns with the Rhodes Precinct Plan.

This report has been prepared in response to the requirements contained within the Secretary's Environmental Assessment Requirements (**SEARs**) dated 14 February 2025 and issued for the SSDA (SSD-67508739). Specifically, this report has been prepared to respond to the SEARs requirement issued below.

Table 2 Relevant SEARs being addressed in this report

ISSUE AND ASSESSMENT REQUIREMENTS	DOCUMENTATION
12. Ground and Water Conditions • Assess potential impacts on soil resources and related infrastructure and riparian lands on and near the site and including soil erosion. • Where required provide a Groundwater Impact Assessment in accordance with relevant Groundwater Guidelines. If the proposed development is on land identified as having high salinity or acid sulfate soil potential in an EPI provide a **Salinity Management Plan** or Acid Sulfate Soil Management Plan that includes appropriate management measures and strategies.	• Geotechnical Assessment If required: • Groundwater Impact Assessment • Salinity Management Plan • **Acid Sulfate Soils Management Plan**

The objective of the salinity review is to determine the salinity hazard at the site and determine if a soil salinity management plan is required during excavation and construction.

The Site

The site is located at 43 – 57 Blaxland Road, 2A, 2B and 2D Cavell Avenue, 448-458 Concord Road and 2A Lewellyn Street, Rhodes. which is within the City of Canada Bay Local Government Area (LGA). The site is legally described in Table 1 above and is currently owned by Leeds Investment Pty Ltd.

The site has frontages to Blaxland Road, Cavell Avenue, Llewellyn Street and Concord Road and is also highly accessible by public transport with the Rhodes Train Station and bus services within easy walking distance.

The site currently accommodates multiple one and two storey detached dwellings which will require demolition in order to allow for the construction of the proposed residential flat buildings and terraces.

The surrounding locality is described below:

- **North:** Directly north of the site is the St. Mary & St. Merkorious Coptic Orthodox Church and Rhodes Community Centre, together with more low density / detached residential buildings.
- **East:** To the east of the site is Concord Road. Further the east is residential development consisting of detached dwellings and townhouses.
- **South:** Directly to the south is a recently demolished site with basement construction underway. The site has an active DA with Canada Bay Council for a mixed-use development**.**
- **West:** To the west of the site is the T9 rail line. Further to the west (across the railway line) is the Rhodes West mixed-use precinct.

The site is located in Rhodes. Rhodes has been identified as an important Strategic Centre in the Eastern City District Plan, with significant opportunities to create additional jobs and homes. Rhodes is approximately 12km north-west of Sydney Central Business District (CBD) and approximately 7.5km east of Parramatta CBD. To the South of Rhodes is the Concord Health district which comprises a Public Teaching Hospital and various other health services.

The site benefits from excellent access to the arterial road network (via Concord Road), which provides connections to key centres in Greater Sydney. Further to this, the site is also in close proximity to Rhodes Train Station which runs on the T9 (Northern) rail line. This line runs from Hornsby through Rhodes to Sydney CBD and north to Gordon.



Figure 1 Aerial Photograph (Source: Urbis)

Reditus notes that this report, including its conclusions and recommendations, must be read in conjunction with the Statement of Limitations provided in **Section 8.**

2 Methodology

This ASSMP has been prepared based on the following methodology:

2.1 Objective

The ASSMP is intended to document previous results, affected media, treatment methodology, appraisal of acid neutralising capacity (ANC), liming rates, and validation testing with respect to the proposed SSDA.

2.2 Scope of Works

To achieve the objectives outlined above, Reditus completed the following:

- Review of the subsurface conditions identified during the previous assessment of the site completed by Reditus.
- Preparation of this ASSMP in accordance NSW Acid Sulfate Soil Management Advisory Committee (ASSMAC) Acid Sulfate Soil Manual 1998, the Australian Governments Department of Agriculture and Water Resources National Acid Sulfate Soils Guidance 2018.

2.3 Regualtory Framework

The following legislation, regulations and industry guidance has been considered in the preparation of this ASSMP:

- NSW Government Protection of the Environment Operations Act 1997.
- NSW Government: Contaminated Land Management Act (1997).
- NSW Government Protection of the Environment Operations (General) Regulation (2009) and the POEO (waste) Regulation 2014.
- NSW EPA Waste Classification Guidelines 2014. Link
  - NSW EPA Waste Classification Guidelines Part 1 Classifying Waste 2014. Link
  - NSW EPA Waste Classification Guidelines Part 4 Acid Sulfate Soils 2014. Link
- The Acid Sulfate Soil Management Advisory Committee (ASSMAC) Acid Sulfate Soils Assessment Guidelines 1998 (known as the "Acid Sulfate Soils Manual"). Link
- Queensland Acid Sulfate Soil Technical Manual, Version 5.1, 2024. Link
- Australian Governments Department of Agriculture and Water Resources National Acid Sulfate Soils (NASS) Guidance National *Acid Sulfate Soils Sampling and Identification Methods Manual* 2018. Link

3 Assessment and Findings

3.1 Overview

Based on review of Canada Bay Local Environmental Plan (LEP) Acid Sulfate Soil Risk Mapping the site lies within a Class 5 ASS area. Development consent is required for the carrying out of works in Class 5 land that is within 500 metres of adjacent Class 1,2, 3 or 4 land that is below 5 mAHD and by which the water table is likely to be lowered below 1 metre AHD on adjacent Class 1,2,3 or 4 land. Class 2 ASS area is located approximately 70 m south-east of the site (see **Figure 2, Appendix A**). It is therefore considered that an ASSMP is required to satisfy Clause 6.1 – Acid Sulfate Soil of the Canada Bay Council LEP 2013 for the excavation works being performed on the site.

An acid sulfate soil (ASS) assessment was conducted within the combined Preliminary Site Investigation and Detailed Site Investigation (PSI/DSI) completed by Reditus (September 2024; ref: 24109RP01, attached in **Appendix B** below) and included an assessment of the presence/absence of ASS and/or Potentially Acid Sulfate Soils (PASS). Based on the results of the investigation, PASS was identified on site, within shale bedrock. Reditus subsequently recommended an ASSMP be prepared for the proposed development.

The management procedures outlined in this ASSMP are based on the results of the PSI/DSI (Reditus, 2024), information provided by the client, and available plans for the site at the time of reporting.

3.2 Site Condition and Surrounding Environment

3.2.1 REGIONAL GEOLOGY AND ACID SULFATE SOIL RISK MAPPING

A review of the NSW Coastal Quaternary Geological Maps shows the site is underlain by sedimentary rocks of the Sydney basin from the Wianamatta Group. Predominantly Ashfield shale consisting of laminate and dark grey siltstone and Bringelly Shale which consists of shale with occasional calcareous claystone, laminate and coal.

The NSW Department of Planning, Industry and Environment 'eSPADE' NSW Soil and Land information portal identifies the site as being within an area not mapped in an area of ASS occurrence, however, land classified as 'X4: Disturbed terrain, elevation >4 mAHD' is located approximately 70 m south-east of the site. This corroborates with data detailed above in **Table 2-1** from Canada Bay Council LEP mapping, which is presented in **Figure 2, Appendix A.**

3.2.2 SITE SPECIFIC GEOLOGY

The site-specific geology will be determined following sampling on site, which will be to be conducted before excavation proceeds.

Site specific geology has been determined from boreholes drilled by Douglas Partners (2024) and Reditus (2024). Soil samples collected from the boreholes were logged in general accordance with the USCS. The geology was described as follows:

- Fill/Topsoil: (thickness ranging from 0.0–0.3 m): SAND, Clayey SAND and Sandy CLAY; loose to firm, medium plasticity clay, dark brown with mottled yellow, fine to coarse grained, dry, no odour, anthropogenic material or staining.
- Natural (Residual): (thickness ranging from 0.2- 3.7 m): SAND, Silty CLAY, CLAY; soft to firm, fine to coarse grained sand, low plasticity, dark brown with orange and red mottled, inorganic, dry, no odour, anthropogenic material or staining. some rootlets present.
- Bedrock: (at depths from 1.5 m): SILTSTONE, brown, grey and dark grey, weathered to extremely weathered, fractured with sandstone laminations.

Borehole logs are included in Appendix D and borehole locations are included in Appendix A of the PSI/DSI which is attached as **Appendix B**.

3.2.3 HYDROLOGY AND HYDROGEOLOGY

The site is situated between Homebush Bay and Brays Bay which are both connected to the Parramatta River. Surface water is likely to flow south-east towards Brays Bay.

A review of the hydrogeology map of Australia (Geoscience Australia) indicated the aquifer type beneath the site is of Triassic age, porous, extensive, and of low-moderate productivity.

Four (4) onsite monitoring wells were sampled as part of the PSI/DSI. The monitoring wells were purged until stabilised physiochemical parameters were obtained. The following observations were made:

- pH indicates a relatively neutral environment in the shallow aquifer underlying the site.
- Electrical conductivity readings indicated a brackish groundwater environment with dissolved salt and inorganics in relatively high concentrations.
- Dissolved oxygen indicates moderate to low levels of dissolved oxygen in the shallow aquifer underlying the site.
- ORP indicates an oxidising environment is present in the shallow groundwater aquifer onsite.

3.2.4 ACID SULFATE SOIL ASSESSMENT

As the site was identified as being within a Class 5 Acid Sulfate Soil (ASS) zone and 4 level basement is proposed at the site, chromium reducible sulfur (CrS) suite analysis was undertaken as part of the PSI/DSI (Reditus, 2024) on selected samples and the results have been compared against the *Action Criteria* from Table 4.4 in the ASSMAC (1998) as well as the NASS (2018). It is noted that the predominant soil type encountered during the intrusive investigation works at the site was clay, therefore 'fine texture – light medium to heavy clays' material type has been adopted.

Laboratory analytical results for CrS compared to the adopted *Action Criteria* is presented in **Table 3-1** below.

Table 3-1 ASS / PASS Assessment Summary

SAMPLE ID	ACTION CRITERIA (>1000 TONNES) FINE TEXTURE MATERIAL		COMMENT
	SULFUR TRAIL (% S)	ACID TRAIL (MOL H^+/t)	
	0.03	**18**	
GBH02_7.0	0.018	12	-
GBH02_9.0	0.013	8	-
GBH02_12.0	<0.005	<5	-
GBH4_5.0	0.014	8.8	-
GBH4_10.0	0.008	<5	-
GBH4_15.0	**0.041**	**26**	Sample exceeded the action criteria for acid sulfate soils
GBH7_7.0	0.010	6.5	-
GBH7_9.0	**0.062**	**38**	Sample exceeded the action criteria for acid sulfate soils

The results in Table 3-1 indicate the presence of potential acid sulfate soils (PASS) on site at location GBH7_9.0 and GBH4_15.0. As the samples were analysed for the CrS suite it was deemed necessary to confirm the findings using the net acid generation (NAG) and net acid production potential (NAPP) methods as specified in the EPA Victoria (2009)

Publication 655.1 *Acid Sulfate Soil and Rock*. Based on the results from the there is PASR present at a depth of 9.0 m bgl at location GBH7 and 15.0 m bgl at location GBH4.

3.2.5 POTENTIAL TO OXIDISE ACID SULFATE SOIL

The relatively specific conditions under which ASS are formed usually limit their occurrence to low lying parts of coastal floodplains, rivers and creeks. This includes areas with saline or brackish water such as deltas coastal flats, backswamps and seasonal or permanent freshwater swamps that were formerly brackish. Due to flooding and stormwater erosion, these sulfidic sediments may continue to be re-distributed through the sands and sediments of the estuarine floodplain region. Sulfidic sediment may be found at any depth in suitable coastal sediments – usually beneath the water table.

Any lowering in the water table that covers and protects PASS or excavation of PASS from below the water table, will result in the aeration and the exposure of iron sulphide sediments to oxygen. The lowering of the water table can occur naturally due to the seasonal fluctuations and drought or by human intervention, in particular agricultural drainage and excavation for development. PASS can also be exposed to air during physical disturbance with the material at the disturbance face, as well as the extracted material, both potentially being oxidised. The oxidation of iron sulphide sediments in PASS may result in net generation of acid, and result in actual ASS.

The following proposed development activities may expose PASS to oxidising conditions during construction:

- Excavation of fill and natural clays that have not been tested for presence/absence of PASS.
- Excavation of shale identified to be PASS.

It is noted that, as the proposed development will consist of up to four (4) basement levels, deep excavation of natural materials will be required. Dewatering will be required to facilitate the proposed basement excavation/construction.

From the previous investigation it is evident that further investigation is necessary in order to classify potential acid sulfate soil and acid sulfate rock. Based on the desktop assessment the fill and natural material overlying the weathered shale is unlikely to be PASS, however, it should be appropriately tested during excavation works using field screening and the chromium reducible sulfur suite in order to effectively characterise the soils for offsite disposal.

The weathered shale should be re-tested during excavation to confirm results using the net acid generation (NAG) and net acid production potential (NAPP) methods as specified in the EPA Victoria (2009) Publication 655.1 *Acid Sulfate Soil and Rock*.

4 Further Investigation

The acid sulfate soil assessment completed during the PSI/DSI was preliminary in nature, however the results indicate there are potential acid sulfate soils and potential acid sulfate rock (PASR) present within the proposed basement excavation.

Due to PASS/PASR being identified, a more comprehensive sampling regime should be completed to appropriately classify the soil and rock underlying the site during excavation.

The investigation should extend a minimum of six soil borings to 1 metre beyond the final depth of excavation with samples taken every 0.5 m or with any changes in lithology in accordance with the ASSMAC (1998).

Final NAG and NAPP values should be compared to the criteria outlined within Table 4 of the EPA Victoria (2009) Publication 655.1 *Acid Sulfate Soil and Rock,* noting that if the rock is classified as 'potentially acid forming', this should be managed in the same way as PASS.

5 Mitigation Measures

5.1 Soil Management Strategy

It should be noted that there are three options for the management of excavated PASS.

- Option 1 involves the excavation and immediate (within 16 hours or less) offsite disposal of PASS to an appropriately licenced landfill facility able to accept PASS, which is then placed back beneath the water table before oxidation occurs. This option is generally selected where site space limitations prevent a PASS neutralisation treatment area to be constructed AND where an appropriately licenced landfill facility is located within close proximity to the site.
- Option 2 involves the excavation and neutralisation of PASS within 24 hours of disturbance, prior to onsite re-use or offsite disposal to an appropriately licensed landfill facility.
- Option 3 involves the excavation and offsite disposal of untreated ASS to a facility licenced to accept such wastes.

The selected option or combination of options can be confirmed once civil design works are complete.

5.1.1 OPTION 1 – DISPOSAL OF PASS TO LANDFILL AND REBURIAL

Identified PASS onsite proposed for removal and offsite reburial below the water table will require transport and acceptance at a suitably licenced facility within 16 hours of disturbance. Each truck load will require measurement of the pH of the soil prior to leaving site. Where the soil is less than 5.6 pH units (or alternate pH as directed by the receiving facility), the load will be considered unsuitable for offsite disposal and will be required to treat onsite. Where the pH of the load is greater than 5.6 pH units (or the alternate pH as outlined by the receiving facility), the material will be considered suitable for offsite disposal and reburial. Records of pH measurement and the corresponding truck registration details are to be maintained as outlined in Section 8.1.3. Furthermore, a record sheet of pH at the time of loading, as well as other relevant details will be retained in the truck for providing to the landfill facility (see record sheet included in **Appendix C**).

If additional forms are required by the receiving body, the associated documentation will require completion as required.

The sample collected from each truck load will be subjected to pH screening using a calibrated meter. Deionised water will be added to the soil sample in a shallow test tube or similar and mixed such that a grout mix paste is generated. The pH probe will be inserted, and the data recorded on the 'Acid Sulfate Soils Load Screening Sheet' included in **Appendix C** and any additional records required by the receiving facility.

Each load will be covered and transported to the licenced landfill facility immediately after excavation and pH testing (to confirm suitability for offsite disposal as PASS). No loads are to leave site after 2:30pm to allow sufficient time to arrive at the disposal facility prior to its closure. In the event that a load is rejected, or the load does not arrive at the disposal facility on the same day (i.e. vehicle breakdown or similar) the load is to be returned to the site for treatment as outlined in Section 6.2. The load and waste tracking records are to be updated accordingly (**Appendix C**).

5.1.2 OPTION 2 – ONSITE SOIL TREATMENT

Neutralisation of ASS/PASS should be undertaken in accordance with this ASSMP which has been prepared with reference to the ASSMAC (1998) guidelines. It will be necessary to prepare suitable treatment area(s) onsite, as described below. The treatment methodology applies to silts, clays and sands at the site which have been determined as PASS:

- Three (3) soil samples submitted for CRS analysis to determine the presence of ASS/PASS were reported as PASS. As such, any soil excavated or disturbed during the excavation works should be treated as PASS. The maximum depth in which PASS was reported was 1.9mbgl.
- Construct perimeter bunding around the treatment area(s) to prevent run-off or run-on (minimum height of 300 mm depending on the size of the treatment area and volume of material to be treated). If on-site soils are utilised for the bunding, they should also be lime treated at the rates as discussed below.
- Strip surface vegetation within area(s) to be used for treatment/stockpiling of PASS.

- Where sandy or highly permeable surface soils are present, place appropriate low permeability soils or low permeability membrane over the surface of the treatment area(s).
- Spread a guard layer of agricultural lime over the ground surface to be used for treatment/stockpiling (1 kg/m^2). Re-application of lime may be required if this guard layer is disturbed or removed during treatment of soils.
- Construct a catch drain/sump at the lowest point on the inside of the bund to collect run-off / leachate from the treatment area. The base of the sump should be inspected and must comprise low permeability (i.e., clay) soils. If low permeability soils are not present the sump should be lined with a low permeability membrane (i.e. HDPE). The surface of the sump/catch drain should also be limed with 1 kg/m^2 of agricultural lime. If a membrane is used the lime should be placed beneath the membrane.
- Install appropriate erosion and sediment control measures for the perimeter of the treatment area(s). **Figure 1** below outlines the basic design of such treatment pads.

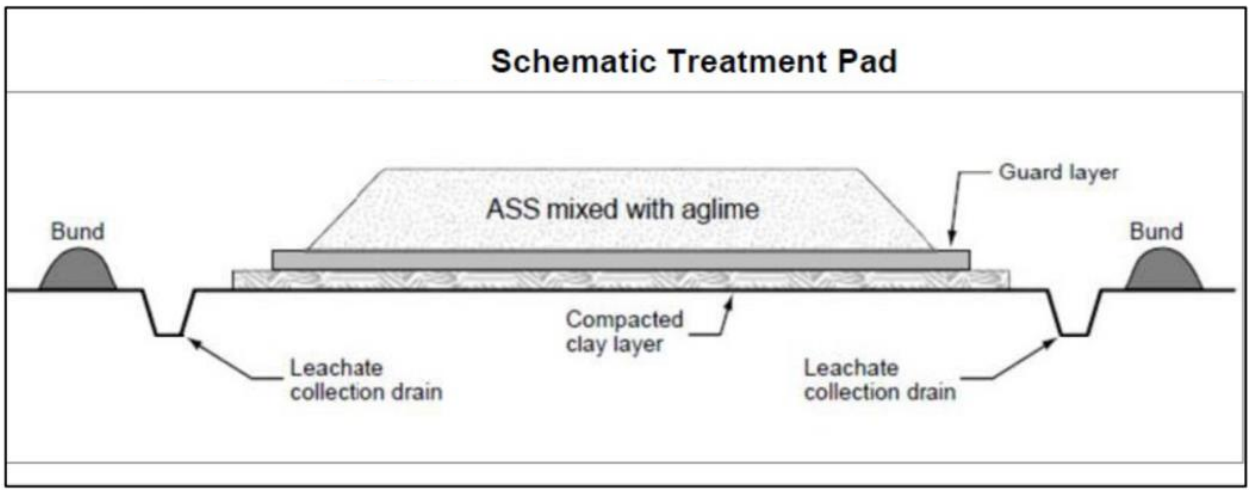


Figure 2 Proposed Treatment Pad Design.

It is noted that the above recommendations for the preparation of the treatment area rely on PASS treatment being conducted as soon as practical (i.e., within 24 hours of excavation).

The location of the bunded area(s) should be selected in order to minimise the potential for impact on nearby sensitive receptors and should be located away from stormwater drains and waterways. Any leachate produced in the bunded area should be contained for monitoring and treatment (if required) as discussed below.

The most suitable neutralising agent for ASS/PASS soils is agricultural lime ($CaCO_3$) and is readily available for purchase in metropolitan areas.

An assessment of the dosing rate for lime treatment can be calculated from the results of detailed laboratory testing completed during the PSI/DSI (Reditus, 2024). NATA laboratory reports are included in Appendix F of the PSI/DSI which is attached in **Appendix B**.

The following liming/monitoring procedures for the treatment of PASS are recommended:

- All excavated PASS should be contained within the suitably bunded area(s) and kept moist to minimise oxidation, prior to treatment with lime. Progressive neutralisation will minimise the area required for bunding.
- Using the calculations provided within the National Acid Sulfate Soils identification and laboratory methods manual (NASS June 2018) and the laboratory results provided within Appendix F of the PSI/DSI, stockpiled PASS should be limed at an initial rate of 4.5 kg/tonne of soil. This is a conservative value and in accordance with the NASS (2018) has assumed the natural buffering capacity is NOT available for neutralisation and includes a safety factor of 1.5 and has been multiplied by the bulk wet density to represent the in-situ soil. This liming rate can be reassessed throughout the treatment process as per the monitoring strategies outlined in Section 8.
- The neutralising agent and PASS should be thoroughly mixed and aerated using, for example, an agricultural lime spreader and excavator, rotary bucket or rotary hoe. The soil should be treated in layers up to 300 mm thick to encourage aeration.

- The liming rate may need to be altered if verification testing indicates that appropriate neutralisation has not been achieved. Conversely the liming rate may decrease if monitoring suggests over-liming has occurred.
- Sampling and testing should be undertaken in accordance with Section 8.1 to verify the neutralisation treatment. The acceptance criteria are discussed in Section 8.2. Depending on the results of testing, reapplication of lime may be necessary to gain adequate neutralisation. Although unlikely, care should be taken to avoid over-liming of soils.
- Upon verification of treatment, the neutralised ASS/PASS soils could be reused on site, ideally underneath a 200-300 mm thick layer of non-PASS material (e.g. topsoil). The geotechnical suitability of the treated soils should be confirmed prior to reuse. Alternatively, treated ASS/PASS could be disposed at a licensed landfill following confirmation of the waste classification by an appropriate qualified consultant. It is noted that ASS/PASS must be appropriately neutralised prior to off-site landfill disposal in accordance with NSW EPA (2014) Waste Classification Guidelines - Part 4: Acid Sulfate Soils.

HYDRATED LIME SHOULD NOT BE USED FOR NEUTRALISATION PURPOSES

5.1.3 OPTION 3 – OFFSITE DISPOSAL OF UNTREATED ASS

Should offsite disposal of untreated ASS to a licenced facility be selected as a disposal option, the proposed facility should be contacted to determine any licence specific conditions on disposal that may exist. Regardless of the classification of the soil, disposal will be at the discretion of the receiving facility. Approval to dispose of the excavated material at the receiving facility will be required prior to transport from the site.

5.2 Temporary Dewatering

Water is the main mechanism by which acid and metals from oxidised ASS are mobilised and transported. Careful management of water is therefore paramount to effective management of potential adverse impacts from PASS/ASS.

The below sections provide strategies for management, assessment and disposal of water which has been in contact with the PASS. This could comprise groundwater or surface water accumulating in excavations. The proposed works are likely to require temporary groundwater dewatering during construction.

5.2.1 DEWATERING MANAGEMENT

Any water extracted as part of dewatering would need to be collected, assessed and treated in accordance with this section as having potentially been impacted by ASS. As such, it is understood that a temporary sump will likely be constructed within the excavation/s during construction for the temporary extraction of groundwater.

5.2.2 WATER ASSESSMENT

All extracted water which has potentially come into contact with PASS/ASS requires assessment (and if necessary, treatment) for the parameters listed in **Table 7-1**, below, as a minimum. This table also details the recommended monitoring frequencies and target thresholds. Water samples are to be collected by a suitably qualified and experienced environmental consultant.

Table 5-1: Suggested Water Monitoring Frequencies and Target Levels for Disposal to Stormwater

PARAMETER	FREQUENCY	TARGET LEVEL FOR DISPOSAL TO STORMWATER
pH	Field measurement: • During storage as required to allow timely treatment; • Immediately prior to disposal; and • Daily checks during discharge period.	• pH 6.5 – 8.5
Total suspended solids (TSS)	Field measurement: • Immediately prior to disposal; and • As required based on visual observations; and Visual assessment:	• water observed to be clear; • turbidity <50 NTU

PARAMETER	FREQUENCY	TARGET LEVEL FOR DISPOSAL TO STORMWATER
	• Daily during discharge period.	
Oil and grease	Visual assessment: • Immediately prior to disposal; and • Daily checks during discharge period; and Laboratory analysis: • as required based on visual observations.	• none observable • <10 mg/l
Iron (total and soluble)	Laboratory analysis: • Immediately prior to disposal; and • Weekly checks during discharge period; and • As required based on visual observations; and Visual assessment: • Daily during discharge.	• ≤ 0.3 mg/L filterable iron • no obvious sign of iron staining/ settlement
Metals (aluminium, arsenic, cadmium, chromium, cobalt, copper, lead, manganese, mercury, nickel, zinc)	Laboratory analysis: • one round of testing before first disposal; • if first round of testing exceeds target levels then further testing prior to disposal is required.	• ANZG (2018) trigger levels for 95% level of protection for marine water ecosystems.

5.2.3 WATER DISPOSAL

Water requiring off-site discharge should be disposed of in accordance with the POEO Act 1997, relevant guidelines, consents and licences.

Should discharge into local stormwater be the proposed management strategy, an approval would be required from the Canada Bay Council. An assessment of discharge water may be required. Where the extracted water is not suitable for discharge, or immediate disposal is required, collection by a suitably licensed water transport company for disposal to a suitably licenced disposal facility will be required. Records of water quality monitoring, volume generated, volume removed, waste disposal records, waste tracking records, water quality reports and waste disposal receipts are required.

5.2.4 GROUNDWATER MONITORING

The PASS below the water table that is disturbed by excavation or dewatering, the groundwater has the potential to be impacted by leaching of low pH or metals from oxidised PASS. As such, monitoring of groundwater for potential impacts would be required in these circumstances.

Groundwater monitoring wells should be installed in the vicinity and/or down gradient of the excavation/s where PASS is being excavated, where possible.

During excavation, weekly monitoring of groundwater should be conducted from the installed monitoring wells. Monitoring of pH will be used as an initial screen.

If a drop in pH of more than 0.5 pH units below the measured background pH is observed at any time during the monitoring programme, the measures detailed below must be implemented

- Groundwater pH decrease by 0.5-1 pH unit below background:
  - Increase pH monitoring to every second day;
  - Undertake groundwater assessment of metals (aluminium, arsenic, cadmium, chromium, cobalt, copper, lead, manganese, mercury, nickel, zinc and iron);
  - Assess possible cause(s) of pH drop and implement measures to prevent further decrease in pH

- Groundwater pH decrease by more than 1 pH unit below background
  - As per pH drop of 0.5-1; and
  - Assess the need for corrective measures to increase pH to background level.

For all construction incidents which pose an environmental threat, an incident report must be completed in order that:

- The cause of the incident may be determined; additional control measures may be implemented; and
- Work procedures may be modified to reduce the likelihood of the incident re-occurring.

5.3 Monitoring Strategies

5.3.1 PROCEDURES

The monitoring program should be designed to provide feedback on the effectiveness of the management strategy and to provide an early warning of the development of any environmental degradation or impact.

It is important that the monitoring programs are carried out objectively in a way that is clearly auditable. During and immediately after the disturbance of the PASS, parameters may need to be monitored in an agreed upon frequency.

In this case, the following should be monitored:

- Surface, ground, and leachate water associated with any disturbance of PASS for parameters including pH and electrical conductivity (EC) or dissolved solids.
- Hydrological observations to ensure the development is not affecting the natural water cover within PASS soil horizons.
- Any soils stockpiled on site should be the subject of an ongoing assessment of the status of any oxidation occurring within the soils, noting that PASS soils are to be treated (or disposed offsite to a licenced landfill able to accept PASS) within 24 hours of disturbance.
- Regular testing of the soils and water should be done by NATA accredited laboratory and methods detailed within the NASS Guidelines (2018).

All monitoring data should be compiled and reviewed regularly against baseline data, appropriate standards and agreed performance targets. Monitoring should ensure that all water discharged from a site complies with the requirements of the relevant water quality legislation, the dewatering management plan, the ANZG Australian Water Quality Guidelines (2018) and any specific water quality objectives set for receiving waters. Performance outside these standards or targets will require remedial action.

A final report should be issued upon completion of the works presenting the monitoring regime and results to confirm that no adverse environmental impact has occurred during the works.

Field Screening

Onsite field screening is a procedure available to monitor the effectiveness of the initial treatment method and to reduce the reoccurrence of ASS validation results failing. The first component of the procedure includes adding deionised water to the pH_{field} soil sample in a shallow test tube or similar and mix such that a grout mix paste is generated. Insert the calibrated pH meter and record the data.

The second component of the field screening (pH_{fox}) requires the addition of peroxide to the second sample from the same stockpile. The peroxide is to be 30% hydrogen peroxide adjusted to pH between 4.5 and 5.5. The pH_{fox} test should be conducted in a heat resistant test tube or similar as vigorous reactions can result in generation of temperatures greater than 80°C. Add a few millilitres to cover the soil with the hydrogen peroxide and stir the mixture. Slowly add the hydrogen peroxide (dependant on the reaction) until a grout like paste is generated. Insert the calibrated pH meter and record the data.

Comparison of pH_{field} and the pH_{fox} results with the trigger levels in Section 8.2.1 will determine whether the stockpiled material has likely been successfully treated for ASS or if the stockpiled material requires additional lime mixing. This field screening will also be adopted to determine if soils suspected of being PASS or soils beneath the water table (i.e. deeper than 1.5m bgl) are PASS.

Once the field screening results indicate that the stockpiled material has been successfully treated, validation samples should be collected by an appropriately experienced environmental consultant and transported to a NATA accredited laboratory for analysis. Stockpiled material is to remain in the designated area until the NATA accredited laboratory reports indicate that the stockpile has been successfully treated and is suitable for reuse onsite or adequately classified for offsite disposal.

It should be noted that hydrogen peroxide and pH adjusting chemicals should be treated with care as incorrect use and/or handling can result in adverse impacts on human health. As such, person associated with field screening should be suitably trained with a safe work method statement or similar generated. This document will require review and approval by the principal contractor prior to undertaking the works.

Soil Neutralisation / Management (IF TREATMENT OPTION IS SELECTED)

It is recommended that the following inspections and monitoring be undertaken when excavating PASS materials based on guidelines presented in the ASSMAC (1998) & NASS (2018) guidelines:

- Daily inspection of liming operations during initial works, to be reviewed following establishment of liming method.
- Sampling and testing after lime treatment. Initially limed soil should be tested at a frequency of at least one sample per 25 m^3 of excavated soil to verify the neutralisation treatment. Samples should be tested in the field for pH_{fox} and at a NATA accredited laboratory for ANC and pH_{KCl} using the CRS method of acid/base accounting.
- The frequency of testing can be reviewed as treatment progresses. A lower frequency of testing could be considered, subject to consistent results, soil conditions and treatment procedures. If the initial five (5) results indicate lime verification was successful, then sampling can be reduced to one sample per 50 m^3 for CRS analysis by a NATA accredited laboratory to confirm appropriate neutralisation.

PASS Disposal

Soil material considered to be PASS and proposed for offsite disposal and reburial (refer Section 6.1) will require additional sampling and data collection. Each load of soil proposed for offsite disposal to a suitably licenced facility will require pH testing (refer Section 8.1.1) with the data recorded on the tracking sheet and on the 'Acid Sulfate Soil Load Screening Sheet' (refer **Appendix C**). This sheet is to be retained by the truck and provided to the receiving facility on arrival. Additional documentation may be required by the receiving facility and should be completed and retained with the vehicle for delivery with each load (as required).

Treatment of Effluent

Effluent generated from the treatment area will require assessment and potential treatment prior to offsite discharge. Alternatively, a licenced liquid waste removal contractor could be engaged to remove the effluent.

Where the effluent is proposed for discharge to stormwater, sampling is required to assess treatment requirements (if any) prior to discharge (see Table 2 above). Water samples are to be collected by a suitably qualified and experienced environmental consultant. The water samples are to be subjected to field screening (using a calibrated water quality meter) and laboratory analysis, as a minimum for the parameters and thresholds listed in Table 2.

Where required, lime is to be added to the effluent to adjust the pH to the level acceptable for discharge. It is considered likely that adjusting the pH will result in precipitation of metals concentrations should they exceed the ANZG (2018) water quality guidelines. A suitably qualified and experienced environmental consultant should be engaged to assist in determining the appropriate application rate for treatment of the effluent. Items to be considered are the type of neutralising agent (e.g. agricultural lime has a low solubility in water) and the method of application. Further, care should be exercised such that the water doesn't become alkaline.

Additional water samples will be required from the treated effluent prior to discharge to confirm successful treatment.

Should discharge into local stormwater be the proposed management strategy, an approval would be required from the Canada Bay Council. An assessment of discharge water may be required. Where the effluent is not suitable for discharge, or immediate disposal is required, collection by a suitably licensed water transport company for disposal to a suitably licenced disposal facility will be required. Records of water quality monitoring, volume generated, volume removed, waste disposal records, waste tracking records, water quality reports and waste disposal receipts are required.

Off-Site Disposal

It should be noted that acceptance of the waste is at the discretion of the receiving body. As such, the waste classification assessment report is to be submitted to the proposed disposal facility, for approval, prior to transport off site. Wastes are to be classified, managed, and disposed in accordance with the relevant council and NSW EPA guidelines and Legislation.

Soil material proposed for offsite disposal is to be sampled at the rate outlined in the NSW EPA (2022) Sampling Design Guidelines. Treatment validation soil samples are to be analysed for:

- Field screen (pH_{field}/pH_{fox}).

Waste classification soil samples (if required) are to be analysed, as a minimum, for

- Heavy metals (arsenic, cadmium, chromium, lead, mercury and nickel);
- TRH.
- BTEX.
- PAH.
- Asbestos.

Where existing data is available, this should be used in the first instance when classifying material for offsite disposal.

Soil samples are to be collected and waste classification reports are to be completed by a suitably qualified and experienced environmental consultant. Treated ASS can, at best, be classified as CT1 General Solid Waste treated acid sulfate soils and the treated material is only suitable for disposal to a suitably licenced waste disposal facility. The analytical results require comparison to the contaminant concentrations outlined in NSW EPA (2014) Waste Classification Guidelines Part 1: Classifying Waste. The landfill should be informed that the ASS has been treated in accordance with the neutralising techniques outlined in the ASS Manual.

Management of Spoil above the Water Table

Standing water level data of groundwater indicate that the minimum depth to water is approximately 2.2 mbgl in the north-east portion of the site and 9.8 mbgl in the south-west portion of the site. Insufficient data has been collected to characterise the fill and natural soils overlying the natural shale, although these materials are unlikely to be PASS, considering the results of the Reditus (2024) PSI/DSI it is recommended that further investigation be carried out. Analytical results indicate that there is not likely to be ASS below the water table, however, further testing should be carried out to confirm if the weathered shale is likely to be acid sulfate rock.

Spoil sourced from the aforementioned depth intervals should be routinely inspected prior to off-site disposal for visual and olfactory indicators of PASS or ASS including:

- Sulfurous smell upon disturbance of soils.
- Presence of shell.
- Presence of jarositic horizons or substantial iron oxide mottling. Jarosite is a characteristic pale yellow mineral deposit, often found along cracks and root channels in soil horizons.
- Unusually clear or milky blue-green drain water flowing from or within the soil being disturbed.
- Extensive iron stains within soil or drain/pooled water.
- Waterlogged unripe muds or estuarine sediments exhibiting soft, buttery, blue grey or dark greenish grey discolouration.

Should one or more of the above indicators of PASS or ASS be observed during excavation of soil horizons above the water table additional field screening in accordance with Section 8.1.1 above is to be carried out at a sample frequency of 1 per 25 m^3 to confirm the presence of PASS. Should field screening results suggest PASS is present, the soil is to be managed in accordance with this ASSMP prior to off-site disposal.

5.3.2 ACCEPTANCE CRITERIA

Soil

Soils will be deemed to have been appropriately neutralised as determined by equation 3.3 of the NASS (2018). All liming verification samples (i.e. those tested for ANC in Section 8.1.1) must have a Verification Net Acidity (VNA) of

less than or equal to 0 mol H^+/t. Given the material is PASS and there is no actual acidity then this can be determined by the following equation:

Verification Net Acidity = Potential Sulfidic Acidity – [post treatment ANC – initial ANC]

If the VNA is greater than zero (0), reapplication of lime may be necessary to gain adequate neutralisation. Care should be taken to ensure over-liming does not occur.

pH results should be within the following ranges:

- pH_{field} 6.0 and 10.0 pH units.
- pH_{KCl} 6.0 and 11.0 pH units.

pH values above these ranges may indicate the materials have been over limed.

Water

Water quality parameters should not vary from the baseline conditions as indicated as below:

- pH should not vary by more than 0.2 units from the baseline range.

In the event of the water quality parameters varying greater than this criteria, further assessment and advice from a suitably qualified professional should be sought. As corrective actions may need to be implemented.

Groundwater from temporary dewatering will need to meet contaminant thresholds listed in **Table 5-1** or removed offsite in accordance with **Section 5.3**.

6 Contingency Plan

In the case where monitored results indicate the agreed standards or performance indicator levels are not being achieved due to failure or ineffectiveness of the management strategy, then immediate remedial action will be required. These remedial actions may apply to individual components of the construction or operation stage of the project that are responsible for the breach of agreed standards.

Remedial action shall comprise mixing of additional lime through the excavated material and neutralisation of leachate (if under-liming has occurred). If monitoring indicates that over-liming has occurred, additional ASS or leachate should be mixed with soils and leachate respectively to reduce pH to acceptable levels. The required mixing rate to treat the soil or leachate should be confirmed by on-site monitoring tests.

Where overland discharge, sewer discharge or stormwater discharge of extracted groundwater is proposed, a contingency plan should be in place to allow neutralisation and confirmation monitoring prior to discharge if pH levels are low or fall below natural background levels. During periods of heavy or prolonged rainfall, stockpiling of ASS should be appropriately contained/bunded to collect leachate for testing and neutralisation (if required) prior to disposal (see Section 6.2). Alternatively, temporary backfilling of PASS could be undertaken to prevent the migration of leachate.

Sufficient lime should be stored on site during construction for the neutralisation of ASS and contingency measures. The development should be conducted with due regard to erosion and sediment controls to minimise potential impacts to nearby sensitive receptors.

When remedial action fails or monitoring results identify severe failure of the management strategy to meet agreed standards, the project should cease to operate, and action should be taken to restore the Site to a condition equivalent to that prior to the commencement of the project.

7 Reporting

The ASSMAC does not require formal reporting of ASS management; however, it is important to keep records of implementation of this ASSMP, including any management and validation process to show compliance with the guidelines. The records should be provided to the Project Principal, and to the consent authority upon request. The records should include documentation of review/ inspection for possible/suspected ASS material in any areas of excavation/ dewatering, and details of any treatment/ management and off-site disposal of ASS materials. This would include records showing that any treated materials were successfully validated.

8 Limitations

This report has been prepared in accordance with the scope of services described in the **Section 2.2**. The letter has been prepared for the sole use of the client and has been prepared in accordance with a scope of work agreed by the client.

The report or document does not purport to provide legal advice and any conclusions or recommendations made should not be relied upon as a substitute for such advice.

The report does not constitute a recommendation by Reditus for the client or any other party to engage in any commercial or financial transaction and any decision by the client or other party to engage in such activities is strictly a matter for the client.

The report relies upon data, surveys, measurements and results taken at or under the site at particular times and conditions specified herein. Any findings, conclusions or recommendations only apply to the aforementioned circumstances and no greater reliance should be assumed or drawn by the client. Furthermore, the report has been prepared solely for use by the client and Reditus accepts no responsibility for its use by other parties. The client agrees that Reditus' report or associated correspondence will not be used or reproduced in full or in part for promotional purposes and cannot be used or relied upon by any other individual, party, group or company in any prospectus or offering. Any individual, party, group or company seeking to rely on this report cannot do so and should seek their own independent advice.

No warranties, express or implied, are made. Subject to the scope of work undertaken, Reditus assessment is limited strictly to identifying typical environmental conditions associated with the subject property based on the scope of work and testing undertaken and does not include and evaluation of the structural conditions of any buildings on the subject property or any other issues that relate to the operation of the site and operational compliance of the site with state or federal laws, guidelines, standards or other industry recommendations or best practice. Scope of work undertaken for assessments are agreed in advance with the client and may not necessarily comply with state or federal laws or industry guidelines for the type of assessment conducted.

Additionally, unless otherwise stated Reditus did not conduct soil, air or wastewater analyses including asbestos or perform contaminated sampling of any kind. Nor did Reditus investigate any waste material from the property that may have been disposed off-site or undertake and assessment or review of related site waste management practices.

The results of this assessment are based upon (if undertaken as part of the scope work) a site inspection conducted by Reditus personnel and/or information from interviews with people who have knowledge of site conditions and/or information provided by regulatory agencies. All conclusions and recommendations regarding the property are the professional opinions of the Reditus personnel involved with the project, subject to the qualifications made above.

While normal assessments of data reliability have been made, Reditus assumes no responsibility or liability for errors in any data obtained from regulatory agencies, statements from sources outside of Reditus, or developments resulting from situations outside the scope of this project/assessment.

Reditus is not engaged in environmental auditing and/or reporting of any kind for the purpose of advertising sales promoting, or endorsement of any client's interests, including raising investment capital, recommending investment decisions, or other publicity purposes. Reditus assumes no responsibility or liability for errors in any data obtained from regulatory agencies, statements from sources outside of Reditus, or developments resulting from situations outside the scope of this project.

Reditus' professional opinions are based upon its professional judgment, experience, and training. These opinions are also based upon data derived from the limited testing and analysis described in this report or reports reviewed. It is possible that additional testing and analysis might produce different results and/or different opinions or other opinions. Reditus has limited its investigation(s) to the scope agreed upon with its client. Reditus believes that its opinions are reasonably supported by the testing and analysis that has been undertaken (if any), and that those opinions have been developed according to the professional standard of care for the environmental consulting profession in this area at this time. Other opinions and interpretations may be possible. That standard of care may change and new methods and practices of exploration, testing and analysis may develop in the future, which might produce different results.

A

Figures



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Map	
24109_rp02_f01_siteloc_v01	
Date of Export	
02/04/2025	
Author	**Approver**
TG	DS
Data Source	
Metromap, Google Maps	

Legend

- Site Boundary
- Major Roads
- Railways
- Surface Water

Watercourses

- Rivers
- Stream (Perennial)
- Stream (Non-Perennial)
- Unnamed Stream (Non-Perennial)
- Other Channels

Figure 1 - Site Location

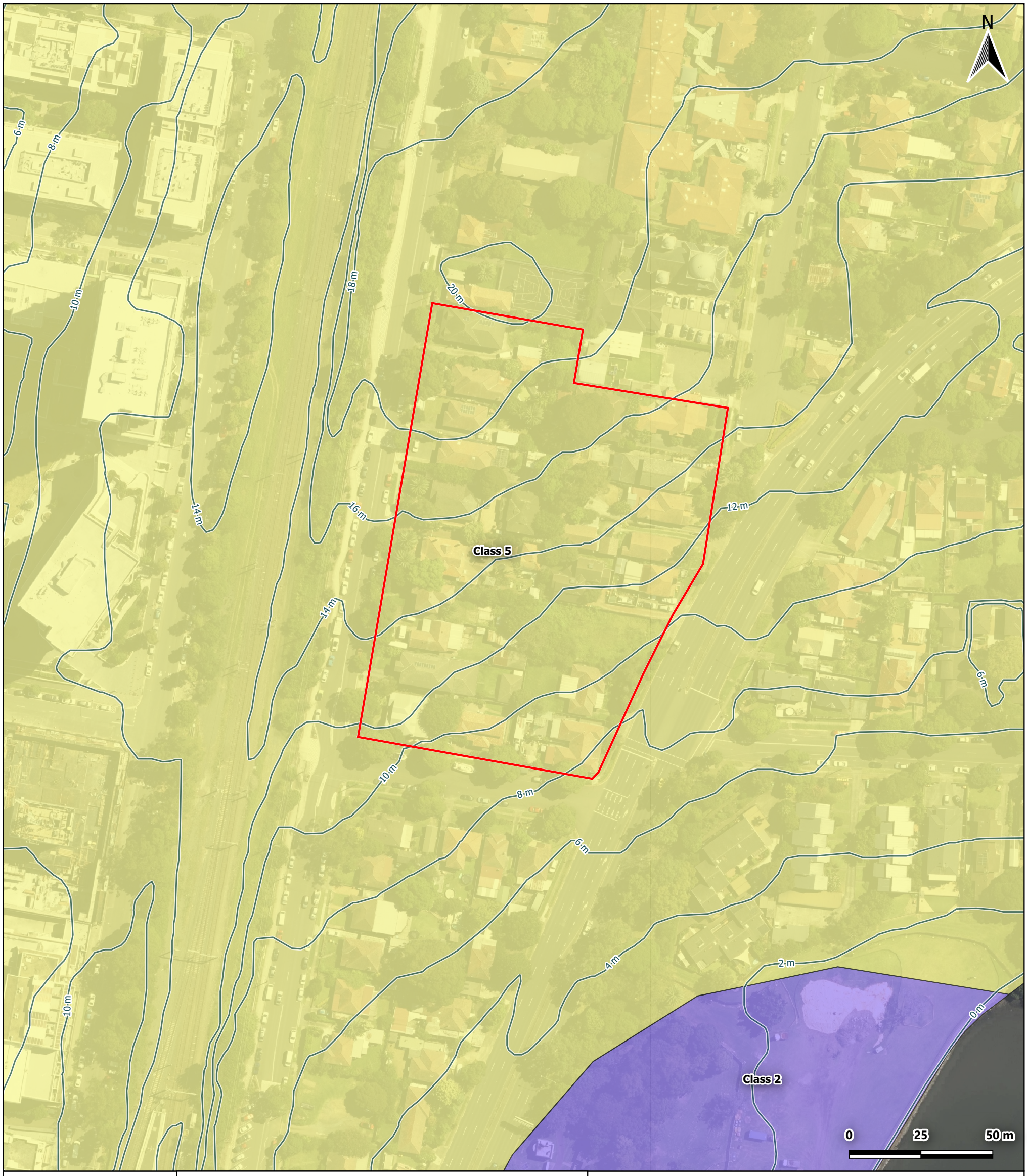
2A Llewellyn St, 43 – 57 Blaxland Rd and 2A, 2B and 2D Cavell Ave, Rhodes NSW

24109 - Acid Sulfate Soil Management Plan

Leeds Investments Pty Ltd

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Map	
24109_rp02_f02_assmap_v01	
Date of Export	**Map Scale (approx. at A3)**
02/04/2025	1:1,600
Author	**Approver**
TG	DS
Data Source	
Metromap, Google Maps, Open Street Map, Geoscience Australia	

Legend

Site Boundary
- Site Boundary

NSW LEP Acid Sulfate Soils
- Class
- Class 1
- Class 2
- Class 2a
- Class 2b
- Class 3
- Class 4
- Class 5

Figure 2 - ASS Mapping

2A Llewellyn St, 43 – 57 Blaxland Rd and 2A, 2B and 2D Cavell Ave, Rhodes NSW

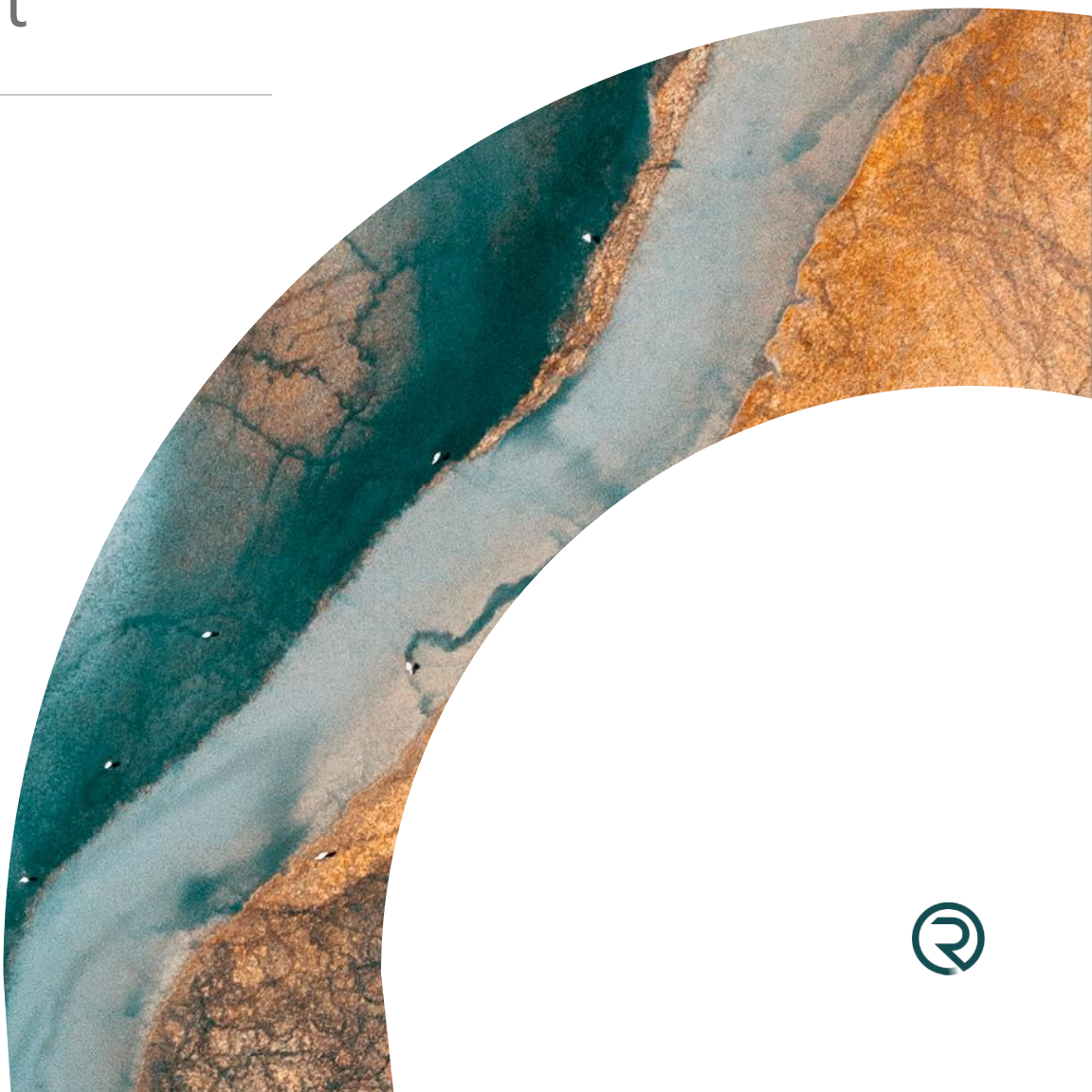
24109 - Acid Sulfate Soils Management Plan

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B

Previous Assessment Report

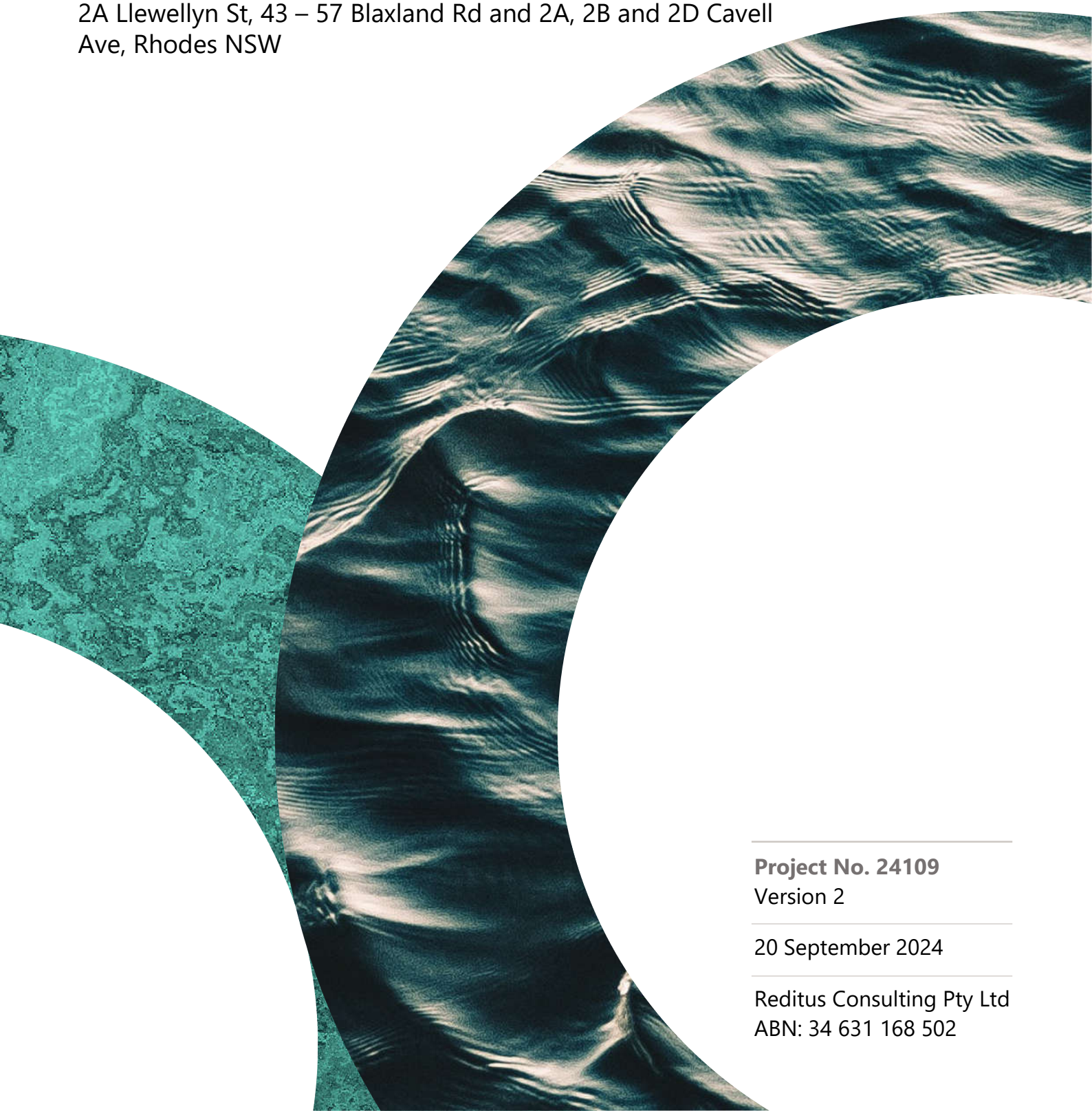


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Preliminary Site Investigation & Detailed Site Investigation

2A Llewellyn St, 43 – 57 Blaxland Rd and 2A, 2B and 2D Cavell Ave, Rhodes NSW



Project No. 24109
Version 2

20 September 2024

Reditus Consulting Pty Ltd
ABN: 34 631 168 502

Preliminary Site Investigation & Detailed Site Investigation

2A Llewellyn St, 43 – 57 Blaxland Rd and 2A, 2B and 2D Cavell Ave, Rhodes NSW

DOCUMENT CONTROL

Prepared by	**Tanner Graham** Environmental Scientist	
Reviewed and approved by	**Ashley Barber** Principal Environmental Engineer CEnvP SCP: SC41210	

This report has been prepared for Leeds Investments in accordance with the terms and conditions of appointment for proposal P24109_v1 dated 27 May 2024. Reditus Consulting Pty Ltd (ABN 34 631 168 502) cannot accept any responsibility for any use of or reliance on the contents of this report by any third party.

DOCUMENT HISTORY

Report No.	24109RP01	24109RP01
Date	13 September 2024	20 September 2024
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Executive Summary

Reditus Consulting Pty Ltd (Reditus) was engaged by Leeds Investments Pty Ltd C/- Billbergia Pty Ltd (Billbergia) (the client) to undertake a combined Preliminary Site Investigation (PSI) and Detailed Site Investigation (DSI) for the Llewellyn Street Development located at Rhodes NSW 2138 (the site).

The proposed project includes demolition of the existing residential structures, and the construction of four residential towers varying in height from 12 to 26 storeys including four basement levels. It is assumed that basement excavations of up to ~12 m below ground level (BGL) will be required.

The primary objective of the combined PSI/DSI was to identify the potential for issues, concerns or environmental risks or liabilities associated with the present and historical uses of the site and provide advice on whether the land is likely suitable (from a contamination perspective) for the proposed residential development. The DSI, including shallow soil and groundwater sampling, and was completed to define the nature, extent and degree of contamination (if any); to assess potential risk posed by contaminants to health and the environment (if any); and to obtain sufficient information to develop a remedial action plan (RAP) to render the site suitable for the proposed development (if required). The specific objectives of the combined PSI/DSI were to:

- Evaluate the possibility for contamination to be present at the site as a result of current and former land use activities.
- Assess the nature and extent of potential contamination in the areas of environmental concern (AEC) identified in the desktop review and site inspection.
- Assess whether Contaminants of Potential Concern (CoPC) (if detected above site assessment criteria) present an unacceptable risk of exposure to human health and/or the environment, in the context of the proposed residential development.
- Provide advice on whether the land is suitable or could be made suitable (from a contamination perspective) for the proposed development.
- Provide recommendations for further investigation, management, or remediation (if required).
- Conform to the requirements of the National Environmental Protection Council (Assessment of Site Contamination) National Environment Protection Measure 1999 (as amended in 2013) ('ASC NEPM, 2013') and the NSW Environmental Protection Authority (NSW EPA 2020) Guidelines for Consultants Reporting on Contaminated Land.

Based on a review of the site history, observations made during fieldwork, results of laboratory analysis and the proposed land use scenario (residential towers with 4 levels of basement carparking), Reditus conclude the following:

- Historical sources of potential contaminated noted during the desktop investigation included importation of fill material of unknown quality, weathering of hazardous building materials and former manufacturing processes from surrounding properties.
- Natural material was noted in boreholes to depths ranging between 0.2-0.3 mBGL.
- Hydrocarbon odours, staining and asbestos containing materials were not observed or identified in any of the soil samples during intrusive works.
- Four (4) groundwater monitoring wells were installed to a maximum depth of 25.0 mbgl. Groundwater was observed to be grey/brown to clear with no odour or sheen.
- Concentrations of CoPC in soil were reported below the applicable site assessment criteria with the exception of benzo(a)pyrene at BH05 (0.1 mBGL), BH12 (0.15 mBGL) and DUP01 (Duplicate of BH10_0.1), and TRH-F3 at BH05_0.1 above the ecological screening level criteria. Copper at location BH05 (0.1 mBGL) and BH21 (0.2 mBGL) as well as Zinc at BH21 (0.2 mBGL) were above the ecological investigation level criteria. No asbestos was detected in any of the soil samples analysed.
- Potential acid sulfate rock was identified on site within shale bedrock at GBH4 (15.0 mBGL) and GBH7 (9.0 mBGL). Although such material doesn't affect the proposed land use, environment controls may be required for the handling acidic bedrock during bulk excavation. Noting the site is within a Class 5 area in which acid sulfate soils are not typically present. The laboratory analysis reported isolated occurrences of net acidity and sulfidic acidity

marginally above the ASSMAC 1998 criteria, however net acidity was below criteria when considered with the naturally occurring acid neutralising capacity of the bedrock.

- Concentrations of CoPC in groundwater were reported below the applicable site assessment criteria with the exception of chromium at MW01, nickel at MW04 and zinc at MW01, MW04 and MW06 above the adopted 95% protection – marine criteria. Noting the groundwater conditions are not considered to inhibit the proposed land use but warrant treatment prior to discharge during dewatering of the basement excavation.

Based on the above, Reditus considers that the site is suitable for the proposed development (residential towers with 4 levels of basement carparking and commercial use on ground levels) subject to implementation of the following recommendations:

- Completion of a pre-demolition hazardous materials (HAZMAT) survey of buildings constructed prior to 2004 in accordance with Australian Standard AS2601-2001 Demolition of Structures. There is a moderate potential for hazardous building materials to be detected within the site structures.
- The identified hazardous materials should be removed and demolition of structures must be undertaken in accordance with the NSW WHS Act, Chapter 8 of the WHS Regulation and SafeWork NSW Codes of Practice and preparation of an Asbestos Management Plan to inform the removal of asbestos containing building materials and lead paint in accordance with SafeWork NSW requirements including clearance certificates provided by a SafeWork NSW Licensed Asbestos Assessor or "Competent Person" as defined by the Code of Practice.
- Following the removal of existing structures and any identified hazardous building materials, analysis of deeper natural soil will be required for offsite disposal in accordance with the NSW EPA (2014) Waste Classification Guidelines. All soils taken offsite for disposal must have waste classifications completed accordance with the NSW EPA (2014) Waste Classification Guidelines. Disposal of site soils must be undertaken in accordance with the NSW POEO Act 1997, POEO (Waste) Regulation 2014 and applicable resource recovery orders.
- The shallow fill soils at BH05, BH10, BH12 and BH21 are required to be removed or managed due to the exceedance of benzo(a)pyrene, copper, zinc and TRH-F3. It is assumed that the soils will be removed as part of the bulk excavation works however, if the soils within this area are to remain onsite, they will require remediation through removal or management of the soils. This will be confirmed after a review of the finalised design of the site is performed.
- Develop an unexpected finds protocol to be implemented during earthworks. This will detail the methods and procedures required to be followed, if during contamination is identified during bulk excavation (e.g. beneath existing structures). Given the detailed site investigation did not identify sources of contamination there is low potential for unexpected finds to occur during the construction phase of the proposed development.
- Dewatering of groundwater shall comply with an approved Dewatering Management Plan to be prepared in accordance with the NSW DPE (2022) Minimum Requirements for Building Site Groundwater Investigations and Reporting guidelines and the Water NSW Mandatory Assessment Requirements for "Application for approval for water supply works, and/or water use".
- Prior to excavation, additional characterisation of potentially acidic bedrock (between 9 to 15 mbgl) will be undertaken to identify whether management of acid sulfate soils is required during bulk excavation and piling works.

1 Introduction

Reditus Consulting Pty Ltd (Reditus) was engaged by Leeds Investments Pty Ltd C/- Billbergia Pty Ltd (Billbergia) (the client) to undertake a combined Preliminary Site Investigation (PSI) and Detailed Site Investigation (DSI) for the Llewellyn Street Development located at Rhodes NSW 2138 (the site).

The location and layout of the site is presented in **Figure 1** and **Figure 2, Appendix A**.

Reditus notes that this report, including its conclusions and recommendations, must be read in conjunction with the Statement of Limitations provided in **Section 13**.

1.1 Background

The site is comprised of 23 existing low density residential dwellings located at 2A Llewellyn St, 43 – 57 Blaxland Rd and 2A, 2B and 2D Cavell Ave, Rhodes NSW. The site is legally described as:

- Lots A & B DP348494,
- Lots A, B & C DP350757,
- Lots 1 & 2 DP874487,
- Lots 1 & 2 DP218467,
- Lot A DP339030,
- Lot 25 DP5923,
- Lots 2 & 3 DP805684,
- Lots 12, 13, 14, 15 & 16 DP792101,
- Lots 2 & 3 DP310311, and
- Lots 480 & 481 DP816840.

The site has a total area of approximately 14,424 m2. It is understood that the proposed project includes demolition of the existing residential structures, and the construction of four residential towers varying in height from 12 to 26 storeys including four basement levels. It is assumed that basement excavations of up to ~12 m below ground level (BGL) will be required.

1.2 Objectives

The primary objectives of the combined PSI/DSI were to:

- Evaluate the possibility for contamination to be present at the site as a result of current and former land use activities.
- Assess the nature and extent of potential contamination in the areas of environmental concern (AEC) identified in the desktop review and site inspection.
- Assess whether Contaminants of Potential Concern (CoPC) (if detected above site assessment criteria) present an unacceptable risk of exposure to human health and/or the environment, in the context of the proposed residential development.
- Provide advice on whether the land is suitable or could be made suitable (from a contamination perspective) for the proposed development.
- Provide recommendations for further investigation, management, or remediation (if required).

  Conform to the requirements of the National Environmental Protection Council (Assessment of Site Contamination) National Environment Protection Measure 1999 (as amended in 2013) ('ASC NEPM, 2013') and the

NSW Environmental Protection Authority (NSW EPA 2020) Guidelines for Consultants Reporting on Contaminated Land.

1.3 Scope of Works

To achieve the objectives outlined above, Reditus completed the following:

- A review of available zoning plans and council documents to determine potentially contaminating activities that may have occurred on the site.
- An evaluation of aerial photographs to assist in assessing historical land uses and conditions on and adjacent to the site.
- A review of the environmental setting with regards to geology, topography, hydrology and hydrogeology.
- A site walkover to characterise the property setting, including inspection of the site surface for obvious signs of potential contamination and/or contaminant sources.
- An evaluation of surrounding land uses to identify any neighbouring activities which may have affected or present a potential risk to the environmental quality of the site.
- Completion of 25 boreholes advanced by hand augur to a maximum depth of 0.3m BGL. This sampling density (i.e. a total of 25 sampling locations) meets the minimum sampling density for a site of 15,000 m^2 as published in the NSW EPA (2022) Sampling Design guidelines.
- Soil samples from each borehole were collected at regular intervals, changes in geology or at zones of gross contamination (nominally from near surface (0.0-0.1 m BGL to -0.3m BGL).
- Each soil sample location was logged in general accordance with the Unified Soil Classification System (USCS)and screened in the field using a Photo-ionisation Detector (PID) to detect the potential presence of volatile organic compounds (VOCs).
- Two (2) soil sample was collected from each borehole, nominally of the near surface materials (typically fill materials) and one soil sample from the underlying material. One selected soil sampled from each borehole (total of 25 primary soil samples) were submitted to a NATA accredited laboratory for analysis. The primary soil samples were submitted for analysis of the following analytes:
  - Total recoverable hydrocarbons (TRH).

    Benzene, toluene, ethylbenzene, xylenes (BTEX).
  - Polycyclic aromatic hydrocarbons (PAH).
  - Eight priority metals (including arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc).
  - Organochlorine pesticides (OCPs) and organophosphate pesticides (OPPs).
  - pH and Cation exchange capacity (2 selected samples).
  - Asbestos (NEPM) (fill samples only).
  - pH_{fox}. analysis of all samples at regular depth intervals and chromium reducible suite analysis (CrS) on 8 selected samples to confirm the presence of ASS materials (undertaken via drill rig during the geotechnical investigation).
- Soil results were compared against the NEPC (2013) NEPM Health Investigation Level (HIL), Health Screening Level (HSL), Ecological Investigation Level (EIL), Ecological Screening Level (ESL) and Management Limits (ML) guidelines.
- Groundwater sampling was performed at the four (4) newly installed monitoring wells (during the geotechnical investigation) and assessed for the following CoPCs
  - TRH.
  - BTEX.
  - PAHs.
  - Eight priority metals.

- Groundwater results were compared against NEPC (2013) NEPM Health Screening Levels (HSLs) and ANZG (2018).
- Preparation of this DSI report in general accordance with the NEPC (2013) NEPM, NSW EPA (2020), SEPP Resilience and Hazards (2021) and other relevant NSW EPA reporting guidelines. The report provides a clear statement of the site suitability for the proposed development and provides recommendations for additional works to render the site suitable (if any). This report was authorised by a EIANZ certified suitably qualified environmental practitioner, Site Contamination Specialist (CEnvP-SC) accredited Principal of Reditus.

2 Site Identification

The site identification details for the site have been prepared in general accordance with the NSW EPA (2020) Consultants Reporting on Contaminated Land guidelines and the ASC NEPM (2013) Field Checklist for 'site Information'. The site identification information has been summarised in **Table 2-1** below.

Table 2-1 Site Identification

ITEM	DETAIL
Address	2A Llewellyn St, 43 – 57 Blaxland Rd and 2A, 2B and 2D Cavell Ave, Rhodes NSW
Title and Land Information	Lots A & B DP348494, Lots A, B & C DP350757, Lots 1 & 2 DP874487, Lots 1 & 2DP218467, Lot A DP339030, Lot 25 DP5923, Lots 2 & 3 DP805684, Lots 12, 13, 14,15 & 16 DP792101, Lots 2 & 3 DP310311 and Lots 480 & 481 DP816840
Site Area	Approx. 14,424 m^2
Local Government Area	City of Canada bay Council
Site Coordinates to the approximate centre of the site (GDA2020 MGA Zone 56)	Easting: 323083.233 Northing: 6255356.706
Zoning	R4: High Density Residential as per City of Canada Bay LEP 2013
Current Owner	Leeds Investment Pty Ltd
Current Land Use	Low density residential
Future Land Use	Proposed residential high-rise building and basement carpark
Trigger for Assessment	Potential fill material of unknown quality across the site. Weathering of hazardous building materials. Surrounding industrial land-use causing contamination on-site.
Surrounding Land Uses	The land uses currently surrounding the site include: • North: Low density residential dwellings, Rhodes Community Centre, St. Mary & St. Merkorious Coptic Orthodox Church and St Mary Multicultural Early Learning Centre. • South: Llewellyn Street, construction site/redevelopment and McIlwaine Park is located a further 100m to the southeast. Rhodes Fire Station is located 150m hydraulically downgradient of the southern site boundary beyond Llewellyn Street. • East: Cavell Avenue, Concord Road followed by low density residential dwellings. • West: Blaxland Road with the Main Northern Railway Line and multi-storey mixed used development beyond.

Site Layout	**Figure 2, Appendix A**

2.1 Site Condition

A site visit was conducted by Reditus' Graduate Environmental Scientist Tiarni Wiersma on 29 July 2024. The following site description was recorded during the site visit:

- The site was noted to be relatively rectangular in nature and consisted of 23 lots. The lots consisted of residential dwellings, paved surfaces (most notably were driveways and car spaces), and one vacant lot.
- To the west, immediately after Blaxland Road, a rail corridor was noted. Additionally, a current development to the south immediately after Llewellyn Street was also observed.
- The residential dwellings appeared to be constructed across multiple decades, with some likely built around the 1940's to 1960's. Most structures were noted to be in good condition and had current occupants.
- One residential property on Blaxland Road was observed to have a large pile of building material within the front yard. No potential asbestos material was observed within this building material.
- The site was bound by Blaxland Road to the west, Llewellyn Street to the south, Concord Road and Cavell Avenue to the east and St. Mary & St. Merkorious Coptic Orthodox Church as well as Rhodes Community Centre to the North.
- Residential sites were secured with fencing around the lot boundaries, whilst the vacant lot facing Concord Road was secured with temporary perimeter fencing.
- No vegetation stress, staining, olfactory or other indications of contamination were observed.
- No evidence of significant quantities of chemical storage was observed within the external premises of residential homes.
- Surrounding land uses around the site, was mostly residential, with some commercial properties to the south near the Rhodes train station entry.

Relevant photographs from the site inspection are provided in **Appendix B**.

3 Site Setting and Surrounding Environment

A summary of the site setting and surrounding environment is provided in **Table 3-1** below.

Table 3-1 Site Setting and Surrounding Environment

ITEM	DETAIL
Topography	The site has an elevation of between approximately 8-20 m Australian Height Datum (AHD) sloping downward in a south-east direction towards Brays Bay (located approximately 150 m southeast).
Hydrology	The site is situated in between Homebush Bay and Brays Bay which are both connected to the Parramatta River. Surface water is likely to flow towards Brays Bay to the east
Regional geology	A review of the NSW coastal Quaternary Geological maps shows the site is underlain by sedimentary rocks of the Sydney basin from the Wianamatta Group. Predominantly Ashfield shale consisting of laminate and dark grey siltstone and Bringelly Shale which consists of shale with occasional calcareous claystone, laminate and coal
Soil Classification	There are two soil landscapes likely to be found on-site, these are described below. Blacktown (9130bt): shallow to moderately deep (<100 cm) Red and Brown Podzolic Soils on crests, upper slopes and well drained areas; deep Yellow Podzolic Soils and Soloths on lower slopes and in areas of poor drainage. Dominant soil materials include friable brownish-black loam, hard setting brownclay loam, strongly pedal, mottled brown light clay, light grey plastic mottled clay. Lambert (9130la): shallow (<50 cm) discontinuous Earthy Sands and Yellow Earths on crests and insides of benches; shallow (<20 cm) Siliceous Sands/Lithosols on leading edges; shallow to moderately deep (<150 cm) Leached Sands, Grey Earths and Gleyed Podzolic Soils in poorly drained areas; localised Yellow Podzolic Soils associated with Shale Lenses. Dominant soil materials include yellowish brown sandy loam (loose and stony), yellow-brown light sandy clay loam, angular blocky puggy clay, blackish brown, loose sandy loam, mottled pale clayey sands, and friable sandstone.
Acid Sulfate Soils (ASS)	The site lies within a Class 5 ASS area and there is no known occurrence within the area. Development consent is required for the carrying out of works in Class 5 land within 500 metres of adjacent Class 1,2, 3 or 4 land that is below 5 mAHD and by which the water table is likely to be lowered below 1 metre AHD on adjacent Class 1,2,3 or 4 land. Based on the above, it will be deemed necessary to assess ASS as part of any further assessment.
Registered Groundwater Bore Search	A review of Bureau of Meteorology's Australian Groundwater Explorer indicated that there are 26 registered bores within a 2 km radius of the site. One well is utilised for irrigation, the remaining 25 are used for monitoring purposes. The drilled depth of these wells ranged from 2.4-180.0 metres. The closest bores are approximately 130 m west of site underneath the Woolworths Rhodes site and extend to a maximum of 4.5 m BGL.
Regional Hydrogeology	A review of hydrogeology map of Australia (Geoscience Australia) indicated the aquifer type beneath the site is of Triassic age, porous, extensive, and of low-moderate productivity.

ITEM	DETAIL
Inferred Groundwater Flow Direction	Groundwater is inferred to flow in a south-easterly direction conforming with regional topography towards Brays Bay which is connected to Parramatta River, approximately 150 m east of site.
Depth to Water Table	Based on the groundwater assessment undertaken during this investigation, the depth to groundwater ranged between 2.24 m below top of casing (BTOC) and 9.83 mBTOC. No other previous groundwater assessments have been conducted at the site.
Yield and Inferred Groundwater Quality	There is no available information for data on the yield and groundwater quality in the surrounding area
Groundwater Dependant Ecosystems	The Groundwater Dependant Ecosystem (GDE) Atlas reports that terrestrial ecosystems to the south-east of the site, along the southern and eastern bank of Brays Bay are deemed as having 'high potential GDE'.
Groundwater Embargoes	No groundwater embargoes apply to the site.
Sensitive Environments	There are Wetlands on the southern extent of both Brays Bay and Homebush Bay and are located within 1 km of the site.

4 Site History

4.1 Historical Aerial Photographs

Historical aerial photographs and satellite images of the site and surrounding area were reviewed and are presented within the Reditus Searches provided in **Appendix C**. The following notable observations were made:

DATE	SITE OBSERVATIONS	SURROUNDING LAND USE OBSERVATIONS
1930	The site appears to be occupied by several low-density residential properties on the eastern portion of the site and two residential properties on the western portion of the site. The western portion of the site is vacant land.	The fire station appears to be present approximately 150 m south of the site. Residential properties and vacant land are present between the southern site boundary and the fire station. The railway runs in a north-south direction immediately west across the road from the site. Further west, there appears to be minor industrial properties along the eastern bank of the Homebush Bay. To the north there appears to be mixed residential and industrial and residential properties and vacant land
1943	Several residential properties were constructed on the western portion of the site with the exception of the southwestern portion which remains vacant land.	Concord Road is constructed to the east of the site running in a north-south direction and is located adjacent to the site. Further industrial development (former Union Carbide and Allied Feeds industrial property) appears to the west of the site.
1955	There appears to be a structure on the northern portion of the site.	The surrounding area appears to be largely unchanged with the exception of further residential development to the south of the Site.
1965	The site remains relatively unchanged.	The surrounding area remains largely unchanged.
1970	The site remains relatively unchanged.	The surrounding area remains largely unchanged.
1986	The site remains relatively unchanged.	The surrounding area remains largely unchanged with the exception of land beyond the railway to the southwest where the residential properties appear to have been demolished and replaced with commercial / industrial buildings. The area formerly occupied by Union Carbide and Allied Feeds industrial properties has been partially demolished.
1991	The site remains relatively unchanged.	The surrounding area remains largely unchanged except for the area formerly occupied by Union Carbide and Allied Feeds industrial properties which is now vacant land.
1994	The site remains relatively unchanged.	The surrounding area remains largely unchanged.
2004	The site remains relatively unchanged.	The surrounding area remains largely unchanged.
2005	The site remains relatively unchanged.	The surrounding area remains largely unchanged.

DATE	SITE OBSERVATIONS	SURROUNDING LAND USE OBSERVATIONS
Recent	The site remains relatively unchanged.	The surrounding area remains largely unchanged with the exception formerly vacant land and commercial industrial properties formerly located to the west and southwest which are now occupied by multi-storey mixed used development, comprising basement parking, residential apartments and commercial and retail space.

4.2 Title Deed Searches

The site has been residential in nature since the 1930s, a tittle deed search and review was not considered necessary to assess the history of the site.

4.3 Previous Investigations

A desktop contamination status letter was conducted by Reditus on 30 April 2024. The findings are summarised in **Table 4-1** below.

Table 4-1 Summary of Previous Investigations

ITEM	DETAIL
DESKTOP ADVICE – CONTAMINATION STATUS (REDITUS 2024)	
Document Information	Desktop Advice – Contamination Status - 2A Llewellyn St, 43 – 57 Blaxland Rd and 2A, 2B and 2D Cavell Ave, Rhodes NSW, dated 30 April 2024
Prepared By	Reditus Consulting Pty Ltd
Prepared for	Billbergia Pty Ltd
Scope of Works	Reditus completed the following: • A desktop evaluation of planning documentation, surrounding land uses and environmental setting. • Identification of areas of environmental concern (AEC) (if any) to target during the intrusive investigation. • Prepare a brief desktop assessment of likely contamination status and potential environmental risks or liabilities in general accordance with the NEPC (2013) NEPM, NSW EPA (2020), applicable NSW EPA endorsed guidelines and State Environment Protection Policy (Resilience and Hazards) 2021

ITEM	DETAIL
Conclusions	The findings of the investigation were as follows: • The historical imagery review indicates that the site has remained relatively unchanged since 1991 and appears to have been used as predominantly residential use. The surrounding area was largely industrialised to the south and the west up until the late 1980s where sites began being redeveloped into large commercial/residential buildings. • Each of the residential lots appears to have been residential from approximately 1944, prior to this site usage is unknown however likely to have been either vacant land, parks or residential in nature. • The history of the site does not indicate any grossly contaminating activities, however, the industrialisation of the surrounding area suggests there is potential for contamination on-site. Potential exists for superficial soil contamination to be present on site related to imported fill, and the weathering of building materials. In the absence of a Detailed Site Investigation (DSI) to identify potential areas of concern or localised hotspots to be conservative, Reditus recommend it would be prudent assume approximately 30% of surface and near surface soils (0.0 to 0.3m BGL) may require remediation (i.e., excavation, removal and off site disposal to a facility licensed to accept such waste) following classification in accordance with NSW EPA (2014) waste guidelines.
Recommendations	Based on the findings of the investigations Reditus provided cost estimates for the remediation of the site based on an estimated 30% of the top 0.3m of soil requiring offsite disposal.

4.4 Regulatory Searches

Review of regulatory records held by NSW EPA and local council is provided in **Table 4-2** below. Documentation obtained from the Reditus searches are provided in **Appendix C**.

Table 4-2 Summary of Regulatory Searches

RECORD	DETAIL
NSW EPA Register of Contaminated Sites	A search of the NSW EPA did not identify any held records of the subject site. The following site are within a 1km radius, and recorded as being a contaminated site under the *Environment Protection Act (1997)*: • Chemical Industry: Homebush Bay sediments adjoining former Berger Paint factory. Contamination currently regulated under CLM act (800 m south-west). • Chemical Industry: Former Glad factory site. Regulation under CLM act not required. (250 m north-west). • Chemical Industry: Former UCAL site. Ongoing maintenance required to manage residual contamination under the CLM Act. (200 m west). • Other Industry: Former Allied Feeds site. Contamination formerly regulated under the CLM Act. (300 m north-west). • Chemical Industry: Homebush Bay sediments adjoining the former UCAL and Allied Feeds sites. Ongoing maintenance required to manage residual contamination under the CLM Act. (350 m north-west). • Other Petroleum: RMS Eastern Precinct. Regulation under CLM Act not required. (600 m north-west).

RECORD	DETAIL
NSW EPA Public Registers	A search of the NSW EPA Public Registers did not identify any notices that have been issued to the site. The following sites contain notices under the *Protection of the Environment (Operations) Act 1997* and are located within a 1km radius: • 1 Mary Street, Rhodes (License surrendered August 2002) – License for contaminated soil treatment works pertaining to the following waste: – Waste oil/water, hydrocarbons/water mixtures or emulsions. – Waste containing polychlorinated biphenyls, polychlorinated naphthalenes, polychlorinated terphenyls and/or polybrominated biphenyls. – Asbestos. – Soils contaminated with a controlled waste. • 2 Leeds Street, Rhodes (License Variation in April 2005) – License for Waste activities pertaining to the storage of clinical and related wastes. • Former Allied Feeds Site: 42 Walker Street, Rhodes (License Surrendered September 2009) – License for the following: – Hazardous, industrial or Group A waste generation or storage. – Non-thermal treatment of hazardous and other waste. – Contaminated soil treatment. – Crushing, grinding and separating. • Former Union Carbide site and Part of the bed of Homebush Bay: 40 Walker Street, Rhodes (License surrendered 27 July 2011) – License for the following: – Hazardous, industrial or Group A waste generation or storage. – Non-thermal treatment of hazardous and other waste. – Contaminated soil treatment.
National Pollutant Inventory Map	The National Pollutant Inventory (NPI) did not identify any facilities within 1 km of the site.
PFAS Investigation Map	No PFAS investigation sites were identified within site boundaries or within 1km radius of site.
Former Gasworks Map	No former gasworks facilities were identified within the site boundaries or within 1km radius of site.
Defence, Military Sites and UXO Areas Map	No former defence, military sites or UXO areas were identified within the site boundaries or within 1km radius of site.

4.5 Potentially Contaminating Processes

Potentially contaminating processes are listed below in **Table 4-3**.

Table 4-3 Potentially Contaminating Processes

ITEM	DETAIL
Historical Importation of Fill	Cut and fill activities have likely occurred on the Site, with filling likely to have across the site. The origin of fill and quality has not been assessed.

ITEM	DETAIL
Former Manufacturing Processes	A review of historical imagery indicate that manufacturing processes occurred on neighbouring properties. Manufacturing processes are not known to have occurred on-site.
Hazardous Materials	A hazardous material survey has not been undertaken on-site. A review of historical imagery indicates that there is potential for hazardous material to have been used in the construction of the buildings on-site.

4.6 PFAS Investigation Sites

Per- and poly-fluorinated substances (PFAS) have more recently been highlighted as a persistent and mobile contaminant, of significant toxicity. The potential risk posed by PFAS contamination has been evaluated by using available site history information with a preliminary decision tree assessment matrix. The potential risk presented by PFAS contamination is presented in **Table 4-4**.

Table 4-4 Summary of PFAS Preliminary Risk Assessment

ITEM	PROBABILITY	DETAIL
Did fire training occur on-site? [1]	Low	Historical aerial imagery deemed it unlikely that fire training occurred at the site.
Is an airport or fire station up gradient of or adjacent to the site?	Low-Moderate	There is a fire station approximately 150 m hydraulically downgradient to the south of the site. PFAS investigation is not deemed necessary on-site.
Have "fuel" fires ever occurred on-site? e.g., ignition of fuel (solvent, petrol, diesel, kerosene) tanks.	Low	The history of whether 'fuel' fires have or have not occurred is unknown. No indication of such was identified in historical photographs.
Have PFAS been used in manufacturing or stored on-site? [2]	Low	There is no evidence of PFAS containing materials historically being stored or used on site.

Notes:

1. Runoff from fire training areas may impact surface water, sediment, and groundwater.
2. PFAS is used in a wide range of industrial processes and consumer products (https://www.industrialchemicals.gov.au/consumers-and-community/and-poly-fluorinated-substances-pfas

5 Preliminary Conceptual Site Model

Based on the information presented in Sections 1-4 of this report, a Conceptual site Model (CSM) has been prepared for the site. The ASC 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 essential elements of the CSM, as required by the ASC NEPM (NEPC, 2013), include an understanding of:

- Known and potential sources of contamination and contaminants of concern including the mechanism(s) of contamination (e.g., 'top down' spill or sub-surface release from corroded tank or pipe).
- Potentially affected media (soil, sediment, groundwater, surface water, indoor and ambient air) and human and ecological receptors.
- Potential and complete exposure pathways.

A tabular CSM provided in Table 5-2 identifies the complete and potential pathways between the known or potential source(s) of contamination and receptor(s).

5.1 Potential Sources of Contamination

The potential sources of contamination identified during this combined PSI/DSI are summarised in **Table 5-1**.

Table 5-1 Potential Sources of Contamination

SOURCE	LOCATION	RATIONALE	CONTAMINANTS OF POTENTIAL CONCERN
Past Industrial / Manufacturing Processes	Off-site	Varied surrounding industrial land uses may introduce contamination to the Site via groundwater migration, with several sites on the NSW EPA Contaminated Sites Register within 1km of the Site, including two sites hydraulically upgradient.	Metals, TRH, BTEX, PAHs, OCP, PCBs, asbestos.
Historical Importation of Fill	On-site	Cut and fill activities have likely occurred on the Site, with filling likely to have occurred towards the eastern site boundary. The origin of fill and quality has not been assessed.	Asbestos, TRH, BTEX, PAH, PCB, OCP, OPP, phenols, heavy metals
Hazardous Materials	On-site	Weathering of hazardous building materials affecting site soils.	Asbestos in building materials. Lead in paint

5.2 Potentially Affected Media

The potentially affected media at the site includes:

- Soil.
- Groundwater.

5.3 Potential Receptors and Pathways

5.3.1 PROPOSED LAND USE SCENARIO AND POTENTIAL RECEPTORS

It is likely that the proposed development will feature some landscaped areas with limited access to soils. Based on the proposed land use, future potential onsite receptors include the following:

- Construction/maintenance workers.
- Future residents or site occupants.
- Parramatta River.

5.3.2 HUMAN HEALTH – DIRECTION CONTACT PATHWAY

It is considered appropriate to assess whether a direct contact source may be present on the site for construction and maintenance workers and future site users. Health impacts should be taken into consideration since there are accessible soils.

5.3.3 HUMAN HEALTH – INHALATION / VAPOUR INTRUSION PATHWAY

It is considered necessary to assess whether a vapour source may be present on the site for construction and maintenance workers in a trench (i.e., for the construction/maintenance of service trenches).

5.3.4 AESTHETICS

No visual evidence of widespread or significant staining was observed at the site at the time of inspection however an assessment of aesthetics can be made during assessment of other pathways.

5.3.5 ECOLOGICAL – TERRESTRIAL ECOSYSTEMS

The NEPC (2013) NEPM requires a pragmatic risk-based approach should be taken in applying ecological investigation and screening levels in residential and commercial / industrial land use settings.

The EIL and ESL guidelines are considered by Reditus to only be applicable to proposed landscaped areas for the proposed development. The proposed development comprises of four basement levels, as such, these landscaped areas will be formed by importing soil from offsite. In addition, the pavement limits the potential for water infiltration into the subsurface layers during rainfall events and thereby reduces the ongoing potential for contaminant mobility and migration from soil to groundwater.

Whilst it is not considered that further assessment of risk to terrestrial ecosystems is warranted, an assessment against the NEPC (2013) NEPM EILs/ESL has been conducted for completeness.

5.3.6 ECOLOGICAL – AQUATIC ECOSYSTEMS

There is potential for migration of contaminants through groundwater from neighbouring properties into the groundwater on-site. There is also potential for migration off-site of potentially contaminated groundwater by sub-surface flow towards Brays Bay. Surface water is likely to drain into the local stormwater network or directly into Brays Bay.

5.4 Potential Transport Mechanisms and Exposure Pathways

Potential transport mechanisms of contamination relevant to the site include:

- Potential historical placement of fill materials.
- Potential weathering of hazardous building materials
- Migration of contaminated groundwater onto the site from off-site sources.

Potential exposure pathways and receptors relevant to the site may include:

- Direct contact with contaminated soils during near or sub-surface works at the site (i.e., trenching and/or excavation works during construction or by future occupants).
- Direct contact via Inhalation of disturbed soil as dust.

- Direct contact with contaminated groundwater during basement construction (i.e., intercept groundwater during basement excavations).
- Surface water run-off discharging via stormwater to Brays Bay (Parramatta River).

Source, Pathway and Receptor Linkages

A preliminary tabular CSM has been prepared for the site based on the outcomes of the combined PSI/DSI (**Table 5-2**). The tabular CSM describes potential linkages and assesses each of the linkages as probably, possible, or unlikely based on the likelihood of occurrence and availability of data.

Table 5-2 Exposure Pathway Assessment

SOURCE	EXPOSURE PATHWAY	RECEPTOR	EXPOSURE
Historical importation of fill *Importation of fill from an unknown source or from adjacent site activities.*	• Direct contact with contaminated soils during sub-surface works at the site (i.e., trenching and/or excavation works) or by future users of the area. • Inhalation of dust and vapours. • Surface water run-off.	• Construction Workers. • Future site occupants. • Maintenance workers[1]	**Possible** The SPR linkage is complete. Assessment of COPCs in fill warranted.
Hazardous building materials *Weathering of hazardous building materials.*	• Direct contact with contaminated soils during sub-surface works at the site (i.e., trenching and/or excavation works) or by future users of the area. • Inhalation of dust and vapours. • Surface water run-off.	• Construction Workers. • Site occupants. • Maintenance workers[1]	**Possible** The SPR linkage is complete. Assessment of ACMs and lead in shallow soils and building fabric (prior to demolition) warranted.
Former manufacturing processes *Off-site migration of hazardous chemicals through groundwater*	• Direct contact with contaminated groundwater during sub-surface excavations (i.e., construction of basement carpark) • Inhalation of dust and vapours. • Ingestion of potentially contaminated soil and groundwater.	• Construction Workers. • Site occupants. • Maintenance workers[1]	**Possible** The SPR linkage is complete. Assessment of COPCs in sub-surface soils and groundwater warranted.

Notes:

1. Maintenance workers attending the site, particularly if works require excavation, trenching or any activities applicable to the sub-surface of the site.

6 Data Quality Objectives

The Data Quality Objective (DQO) process is a systematic planning tool based on the scientific method for establishing criteria for data quality and for developing data collection designs. The DQO defines the experimental process required to test a hypothesis. The DQO process has been developed to ensure that efforts relating to data collection are cost effective, by eliminating unnecessary, duplicative or overly precise data whilst at the same time, ensuring the data collected is of sufficient quality and quantity to support defensible decision making.

It is recognised that the most efficient way to accomplish these goals is to establish criteria for defensible decision making before data collection begins and develop a data collection design based on these criteria. By using the DQO process to plan the investigation effort, the relevant parties can improve the effectiveness, efficiency and defensibility of a decision in a resource and cost-effective manner.

The DQO process consists of seven steps, which are designed to clarify the study objectives, define the appropriate type of data and specify tolerable levels of potential decision errors. The seven-step DQO process adopted for this combined PSI/DSI can be summarised as:

- **Step 1: State the Problem** – concisely describe the problem to be studied. Review prior studies and existing information to gain a sufficient understanding to define the problem.
- **Step 2: Identify the Decision** – identify what questions the study will attempt to resolve, and what actions may result.
- **Step 3: Identify the Inputs to the Decision** – identify the information that needs to be obtained and the measurements that need to be taken to resolve the decision statement.
- **Step 4: Define the Study Boundaries** – specify the time periods and spatial area to which decisions will apply. Determine when and where data should be collected.
- **Step 5: Develop a Decision Rule** – define the statistical parameter of interest, specify the action level, and integrate the previous DQO outputs into a single statement that describes the logical basis for choosing among alternative actions.
- **Step 6: Specify Tolerable Limits on Decision Errors** – define the decision maker's tolerable decision error rates based on a consideration of the consequences of making an incorrect decision; and
- **Step 7: Optimise the Design** –evaluate information from the previous steps and generate alternative data collection designs. Choose the most resource-effective design that meets all DQOs.

The DQOs are provided in **Table 6-1** below and were derived in accordance with Australian Standard 4482.1-2005 'Guide to the investigation and sampling of sites with potentially contaminated soil. Part 1: Non-volatile and semi-volatile compounds' (AS 4482.1-1997).

Table 6-1 Data Quality Objectives

ITEM	DETAIL
Step 1: State the problem	The site is proposed to be developed to include four residential towers (12-26 storeys) including four basement carpark levels. The site inspection identified the potential for fill material to have been placed at the site and for weathering of hazardous building materials. A contamination assessment was required to inform the development application (DA) to meet SEPP Resilience and Hazards (2021) requirements.

ITEM	DETAIL
Step 2: Identify the decision/goal of the study	If elevated concentrations of COPCs are identified at the site: • Have potentially contaminating activities occurred on the site? If so, what level of site investigation is required to define the nature, extent and degree of contamination (if any)? • What is the extent of the impact? • Does any COPC at the site occur at concentrations that pose or may pose an unacceptable liability or risk to the environment and/or human health to persons who will utilise the future development? • If so, what is the order of priority to minimise the risk and what additional measures are required to mitigate, remediate, or manage the risk? • Is the site suitable for the proposed land use setting, in the context of land contamination?
Step 3: Identify the information inputs	Key data required to resolve the project problem included concentrations of COPC in the soil collected in the study area and the structure and depth of the underlying site geology. The COPC selected were based on the brief historical assessment and the current site condition observed during fieldworks. The guidelines adopted by Reditus to assess the soil results were as follows. Soil site suitability: • NEPM ASC (2013) Health Screening Levels (HSLs) A&B – Residential - Sand. • NEPM ASC (2013) Health investigation Levels (HIL) B – Residential with minimal access to soils. • NEPM ASC (2013) Management Limits (ML) – Residential, parkland and public open space – Coarse soil. • NEPM ASC (2013) HSL-B for asbestos contamination in soil – Residential with minimal opportunities for soil access land use setting. • NEPM ASC (2013) Ecological Investigation Levels (EIL) – Urban residential & public open space – generic trigger values. • NEPM ASC (2013) Ecological Screening Levels (ESL) – Urban residential – Coarse Soil.
Step 4: Define the boundaries of the study	This investigation was restricted to the physical site boundaries, as shown in **Figure 2**, **Appendix A**. The vertical extent of the study boundaries was limited to a maximum depth of 0.3m BGL for soils and 25m BGL for groundwater. The temporal boundaries of the study were limited to the date that the investigations were completed.
Step 5: Develop a decision rule	If the concentrations of COPCs in the soil are reported to be below the relevant adopted tier 1 assessment guidelines, then the soil will be deemed suitable, and no management/remediation options will be proposed for continued land use at the site. If, however, the concentration of one or more COPCs are greater than the guidelines, then further investigation will be required to laterally and vertically delineate the extent of the impact and/or recommendations made for the remediation/management of contamination to render the site suitable for the proposed use.

ITEM	DETAIL
Step 6: Specify tolerable limits on decision errors	The acceptable limits for samples are as follows: % RPD for laboratory duplicates for TPH and BTEX analysis is less than 60%; and Recovery of matrix spikes and surrogate spikes is as per the laboratory's Quality Assurance targets accepted under their National Association of Testing Authorities (NATA) accreditation. Precision is measured using the standard deviation 'SD' or Relative Percent Difference '%RPD'. Replicate data for field duplicates of organics is expected to be as follows: • RPD criteria of 50% or less, for concentrations > or = 10 times practical quantitation limits (PQL); • RPD criteria of 75% or less, for concentrations between 5 and 10 times the EQL; and • RPD criteria of 100% or less, for concentrations < 5 times PQL. Replicate data for field duplicates for inorganics, including metals is expected to be as follows: • RPD criteria of 30% or less, for concentrations > or = 10 times PQL; • RPD criteria of 75% or less, for concentrations between 5 and 10 times the EQL; and • RPD criteria of 100% or less, for concentrations < 5 times PQL. Where acceptable limits for field duplicates were not met, a discussion on low biased error will be provided. For this investigation, a decision error of 5% will be considered acceptable This error rate is in accordance with Appendix B of Schedule B(2) of the ASC NEPM. In order to achieve this level of confidence, the investigation has been designed as described below.
Step 7: Optimise the design	Soil samples were collected on both a judgemental (targeted) and systematic grid-based sampling design program, with COPC analysis based on the known areas of environmental concern (AECs). Soil samples were collected at relevant intervals, changes in geology or in zones of gross contamination and locations selected for efficient and representative sampling. All media sampled was conducted in accordance with Reditus standard operating procedures (SOPs) and relevant industry guidelines.

7 Tier 1 Assessment Criteria

Tier 1 assessment involves the comparison of monitoring data to published guideline criteria (typically presented as screening levels). Relevant criteria are selected based on the identified viable exposure pathways and COPCs and proposed land use.

In Australia, appropriate HILs (including interim HILs for vapour intrusion and, where applicable, HSLs for petroleum hydrocarbons and assessment criteria for asbestos) are used for Tier 1 screening to provide a rapid assessment of whether the site contamination may be of concern with respect to human health. Should contaminant concentrations at a site occur at levels that are below the Tier 1 levels, this implies that for the majority of the people in the population there is no significant health risk from contamination and that remedial action may not be required to protect human health.

Exceedances of the tier 1 HILs should be identified and considered. Tier 1 HIL exceedances do not imply that a risk is necessarily present, but that further assessment may be justified. Tier 1 HILs are not intended to indicate a clear demarcation between acceptable and unacceptable. Marginal exceedances may not require quantitative Tier 2 risk assessment to conclude that further assessment is not necessary. The magnitude of the exceedance should be considered in the context of the CSM (that is, whether the exposure pathways are plausible and whether exposure will result in harm).

Tier 1 screening criteria (including HILs and HSLs) should only be used where there has been adequate characterisation of a site (that is, appropriate representative sampling has been carried out). For this combined PSI/DSI the maximum reported concentrations for each sample and analyte will be compared against the tier 1 criteria. Should any individual sample exceedance of the tier 1 criteria exist, the 95% Upper Confidence Limit (UCL) of the analyte for the site data set was calculated and compared to relevant Tier 1 screening criteria. However, the implications of localised elevated values should also be considered. In order to adopt the 95% UCL result, the analyte data set must also meet the following criteria:

- The standard deviation (SD) of the results should be less than 50% of the Tier 1 screening criteria.
- No single value exceeds 250% of the relevant Tier 1 screening criteria (characterised as a 'hot-spot').

Where site data exceeds the screening levels or suitable screening levels cannot be identified, further consideration (Tier 2 assessment) is required.

7.1 Soil Assessment Criteria

Tier 1 assessment involves the comparison of monitoring data to published guideline criteria (typically presented as screening levels). Relevant criteria are selected based on the identified viable exposure routes and the available data. Where site data exceed the screening levels or suitable screening levels cannot be identified, further consideration (Tier 2 assessment) is required.

The tier 1 assessment criteria were adopted from:

- National Environment Protection Council (NEPC) 1999, 'Schedule B(1) Guideline on Investigation Levels for Soil and Groundwater, National Environment Protection (Assessment of site Contamination) Measure (NEPM), as amended in 2013'.
- Acid Sulfate Soil Manual (1998) Acid Sulfate Soil Management Advisory Committee, NSW (ASSMAC 1998).

The soil assessment criteria (SAC) adopted for this combined PSI/DSI were:

- NEPC (2013) NEPM HIL-B criteria values have been adopted to assess concentrations of COPC in soil for site suitability and human health in a high-density residential and commercial/industrial land use scenario.
- NEPC (2013) NEPM HSL-B guidelines for vapour intrusion have been adopted to evaluate the risk posed from vapour intrusion in a high-density residential with minimal access to soil land use scenario. The soil HSLs are based on depth of impacts, overlying soil type and land use. The selection of HSL-B was to screen for the site for land use scenarios in relation to the potential receptor/s onsite and the exposure that may be experienced. After a review of subsurface conditions, the guidelines for sand were selected. The 0-1 m, 1-2 m, 2-4 m, and >4 m criteria values have been adopted.

- NEPC (2013) NEPM ML residential/parkland guidelines have been adopted and are used to consider the potential formation of light non-aqueous phase liquids, fire and explosion risks and damage to buried infrastructure. A fine-grained soil type was selected after a review of subsurface conditions encountered during investigation works completed at the site.
- NEPC (2013) NEPM ESLs and EILs were both selected to determine the risk of potential contamination to identified ecological receptors on the site, in the context of an urban residential/public open space. Both ESL and EIL criteria values are applicable for the first 2m of the soil profile.
- EIL criteria (urban residential and public open space (NSW, high traffic, aged)) values were derived using both results of the laboratory analysis and academic values and where appropriate, using the NEPM EIL Interactive Calculation Worksheet available at http://www.nepc.gov.au/nepms/assessment-site-contamination/toolbox. The following input parameters were adopted from the NSW Government eSpade viewer to derive EILs, noting that where a range of values were given, the average of those two values was selected as an input:
  - **Clay (%):** 27.5%
  - **Soil organic carbon (OC %):** 2.5%
  - **Cation Exchange Capacity (meq/100g):** 8.4
  - **Soil pH:** 7.8
- Soil analytical results for the in-situ acid sulfate soil assessment will be compared against the *Action Criteria* outlined in the Acid Sulfate Soil Manual (1998) Acid Sulfate Soil Management Advisory Committee, NSW (ASSMAC 1998). As well as the National Acid Sulfate Soils Guidance: *national acid sulfate soils identification and laboratory methods manual (NASS 2018)*.

Soil analytical results are tabulated in **Table 1**, **Appendix E**, and guideline criteria are presented below in **Table 7-1**.

Table 7-1 Adopted Soil Assessment Criteria (mg/kg)

CHEMICAL GROUP	ANALYTE	HIL-B	HSL-A&B, SAND				EIL	ESL	ML
			0-1 m	1-2 m	2-4 m	>4 m	URBAN RES & PUBLIC OPEN SPACE	URBAN RES, COARSE, 0-2 M	URBAN RES, FINE SOIL
BTEX	Naphthalene	-	3	NL	NL	NL	170	-	-
	Benzene	-	0.5	0.5	0.5	0.5	-	50	-
	Toluene	-	160	220	310	540	-	85	-
	Ethylbenzene	-	55	NL	NL	NL	-	70	-
	Xylene Total	-	40	60	95	170	-	105	-
TRH	C_6-C_{10} Fraction (F1)	-	-	-	-	-	-	-	700
	C_6-C_{10} (F1 minus BTEX)	-	45	70	110	200	-	180	-
	>C_{10}-C_{16} Fraction (F2)	-	-	-	-	-	-	120	1,000
	>C_{10}-C_{16} Fraction (F2 minus Naphthalene)	-	110	240	440	NL	-	120	-
	>C_{16}-C_{34} Fraction (F3)	-	-	-	-	-	-	300	2,500
	>C_{34}-C_{40} Fraction (F4)	-	-	-	-	-	-	2,800	10,000
PAH	Benzo(a) pyrene	-	-	-	-	-	-	1.4	-
	Benzo(a)pyrene TEQ (LOR)	4	-	-	-	-	-	-	-
	PAHs (Sum of total)	400	-	-	-	-	-	-	-
Metals	Arsenic	500	-	-	-	-	100	-	-
	Cadmium	150	-	-	-	-	-	-	-
	Chromium (III+VI)	500 [1]	-	-	-	-	580 [2]	-	-
	Copper	30,000	-	-	-	-	220	-	-

CHEMICAL GROUP	ANALYTE	HIL-B	HSL-A&B, SAND				EIL	ESL	ML
			0-1 m	1-2 m	2-4 m	>4 m	URBAN RES & PUBLIC OPEN SPACE	URBAN RES, COARSE, 0-2 M	URBAN RES, FINE SOIL
	Lead	1,200	-	-	-		1,100	-	-
	Mercury	120	-	-	-		-	-	-
	Nickel	1,200	-	-	-		120	-	-
	Zinc	60,000	-	-	-		460	-	-
OCP	Aldrin + Dieldrin	10	-	-	-		-	-	-
	Chlordane	90	-	-	-		-	-	-
	DDT	-	-	-	-		180	-	-
	DDT+DDE+DDD	600	-	-	-		-	-	-
	Endosulfan	400	-	-	-		-	-	-
	Endrin	20	-	-	-		-	-	-
	Heptachlor	10	-	-	-		-	-	-
	Hexachlorobenzene	15	-	-	-		-	-	-
	Methoxychlor	500	-	-	-		-	-	-
OPP	Chlorpyrifos	340	-	-	-		-	-	-

NL – No limit

[1] Chromium (VI) HIL criteria has been applied to concentrations of Chromium (III+VI) for conservatism.
[2] Chromium (III) EIL criteria has been applied to concentrations of Chromium (III+VI) for conservatism.

7.2 Groundwater Assessment Criteria

Selection of the groundwater assessment criteria (GAC) was based on the proximity of the site to sensitive surrounding surface water receptors, groundwater extraction in the area, and water quality of the aquifer. The groundwater analytical data were compared against the following adopted Tier 1 screening criteria:

- NEPM ASC (2013) HSLs for vapour intrusion HSL-A&B for residential land use with groundwater depth between 2 and <8 m within sand.
- ANZG 2018 – 95% species protection default guideline value (DGV) (supersedes the NEPM ASC (2013) Groundwater Investigation Levels (GILs)) for marine water as Homebush Bay and Brays Bay are brackish estuarine environments.

The ANZG (2018) is a revision of the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC & ARMCANZ 2000) presented as an online platform, to improve usability and facilitate updates as new information becomes available.

Revisions to DGVs since the ANZECC & ARMCANZ (2000) guidelines have been provided for the 'aquatic ecosystem' community value. DGVs have been revised for physical and chemical (PC) stressors based on increased understanding, broader monitoring data collected since 2000.

The NEPM ASC (2013) GILs were derived using the ANZECC & ARMCANZ (2000), which were subsequently revised (superseded) in ANZG (2018). As such, the ANZG (2018) DGVs will be used as an initial screening in replace of the NEPM ASC (2013) GILs as they provide concentrations which once exceeded require further investigation into receptors and points of extraction and use.

7.2.1 HUMAN HEALTH – VAPOUR INTRUSION

The groundwater concentrations have been assessed against the NEPC (2013) NEPM HSL-A&B to evaluate the risk posed from vapour intrusion. The selection of HSL-A&B was based on the proposed residential development, the potential receptor/s onsite, and the exposure that may be experienced. HSLs for sand have been adopted after a review of subsurface conditions encountered during investigation works completed at the site.

7.2.2 HUMAN HEALTH – DRINKING WATER

The NSW DECC (2007) *Guidelines for the Assessment and Management of Groundwater Contamination* describes the process involved in identifying the likely environmental values which must be considered to be preserved in groundwater investigations at contaminated sites. Based on the NSW DECC (2007) Guidelines, determination of environmental values follows the steps below:

- Determine whether the aquifer beneath the site is included in the NSW Department of Natural Resources (NSW DNR) list of major aquifers of drinking water quality.
- Determine the identified uses of groundwater from the aquifer.
- Assess groundwater indicators to determine whether the aquifer is suitable for use as a drinking water source. The NSW DECC has stated that "Groundwater with TDS concentrations below 2000 mg/L is suitable for potential drinking water supply, and hence should be afforded this level of protection from contamination unless other site-specific factors, such as low yield, render such use unlikely." (NSW DECC, 2007).

Reditus note the following site hydrogeological conditions:

- The site is not situated within a known drinking water groundwater management unit (GMU) protected by the NSW DNR as an actual or potential drinking water supply (NSW DECC, 2007).
- The site is located within an urban area and is connected to a potable reticulated water supply. Therefore, groundwater is unlikely to be used for exaction purposes.
- The site and surrounding area have been used for commercial/industrial uses since at least the 1940s, therefore, groundwater in the area is unlikely to be used as a drinking water resource.

Based on the known commercial/industrial nature of the surrounding area, the presence of a reticulated water supply in the highly urbanised environment, the absence of registered groundwater bores nominated for drinking water use within a 1 km radius of the site (apart from one bore registered for "irrigation purposes") – the use of groundwater in the immediate vicinity of the site for domestic purposes (both potable and non-potable use) is considered highly unlikely.

As such, the Australian Drinking Water Guidelines (2011) for both human health and aesthetics were not considered when adopting the GACs.

7.2.3 HUMAN HEALTH – RECREATIONAL WATER GUIDELINES

Given the proximity of Brays Bay to the site (located approximately 170 m south-east of the site) groundwater underlying the site likely discharges into Parramatta River. Therefore, recreation water guidelines have also been adopted for this assessment. The recreation water guideline values have been derived from the Australian Drinking Water Guidelines (2011) for human health by multiply the drinking water guidelines by a factor of 10, to adjust for the reduced daily intake during swimming and recreational activities in water (i.e., 10% of drinking water intake).

7.2.4 ECOLOGICAL GROUNDWATER ASSESSMENT CRITERIA

Use of the 95% protection level (for the ANZECC 2000 Guidelines) assumed that the surrounding watercourses are moderately disturbed ecosystems. This is as defined in Section 3.1 of the guidelines as receiving road and storm water runoff from adjacent industry and residential properties, consistent with the setting and surrounding environment of the site.

The ANZG (2018) 95% marine water guidelines for groundwater were adopted as screening criteria, based on the nearest surface water receptors and discharge point for groundwater leaving the site being Brays Bay, which drains into the Parramatta River, which is noted to be brackish and saline in nature at the point.

Groundwater analytical results are tabulated against the groundwater assessment criteria in **Table 7-2.**

Table 7-2 Adopted Groundwater Assessment Criteria (µg/kg)

CHEMICAL GROUP	ANALYTE	HSL-A&B - SAND			ANZG (2018) 95% PROTECTION MARINE WATER	RECREATIONAL WATER GUIDELINES
		2-4 m	4-8 m	>8 m		
BTEX	Naphthalene	NL	NL	NL	70	-
	Benzene	800	800	900	700	10
	Toluene	NL	NL	NL	180	8,000
	Ethylbenzene	NL	NL	NL	80	3,000
	Xylene Total	NL	NL	NL	-	6,000
TRH	C_6-C_{10} Fraction (F1)	-	-	-	-	800
	C_6-C_{10} (F1 minus BTEX)	1,000	1,000	1,000	-	-
	>C_{10}-C_{16} Fraction (F2)	-	-	-	-	-
	>C_{10}-C_{16} Fraction (F2 minus Naphthalene)	1,000	1,000	1,000	-	-
	>C_{16}-C_{34} Fraction (F3)	-	-	-	-	-
	>C_{34}-C_{40} Fraction (F4)	-	-	-	-	-
PAH	Anthracene	-	-	-	0.4	-
	Benzo(a) pyrene	-	-	-	0.2	0.1
	Fluoranthene	-	-	-	1.4	-
	Phenanthrene	-	-	-	2	
Metals	Arsenic	-	-	-	24	100
	Cadmium	-	-	-	5.5	20
	Chromium (III+VI)	-	-	-	4.4**	500**

CHEMICAL GROUP	ANALYTE	HSL-A&B - SAND			ANZG (2018) 95% PROTECTION MARINE WATER	RECREATIONAL WATER GUIDELINES
		2-4 m	4-8 m	>8 m		
	Copper	-	-	-	1.3	20,000
	Lead	-	-	-	4.4	100
	Mercury	-	-	-	0.4	10
	Nickel	-	-	-	70	200
	Zinc	-	-	-	8	-

*freshwater criteria adopted in absence of marine criteria

** Cr(VI) adopted for total of Cr(III) & Cr(VI)

8 Methodology

The methods used for the collection of data are presented in the following sections.

8.1 Schedule of Works

The schedule of fieldworks completed at the site and Reditus personnel involved is provided in **Table 8-1** below. It is noted that all Reditus personnel involved are suitably qualified and experienced in the collection of environmental samples and environmental site investigations.

Table 8-1 Schedule of Works

DATE	DETAIL OF WORKS	REDITUS PERSONNEL
8 - 9 August 2024	Site inspection and soil investigation/drilling	Tiarni Wiersma *Graduate Environmental Scientist*
13 – 15 August 2024	Soil investigation/sampling for ASS	
22 August 2024	Groundwater monitoring event.	

8.2 Sampling Analysis Plan and Sampling Rationale

The intention of the sampling plan was to attain the objectives stated in **Section 1.2**. To achieve this a judgemental (targeted) and systematic grid-based sampling design program was adopted for this DSI. The sampling plan was based on a historical desktop information, the specific design plans for the site, site observations, NSW EPA (2022) Sampling Design Guidelines, and had the goal of providing sufficient data to allow for in-situ assessment and characterisation of soil and groundwater at the site.

Sample locations are presented on **Figure 2, Appendix A**. A total of 25 boreholes (BH01 to BH25) were completed for the purposes of soil sampling. An additional twelve (12) boreholes were drilled by Douglas Partners for geotechnical and soil sampling purposes with four (4) borehole locations being converted to groundwater monitoring well locations (MW01, MW03, MW04 and MW06). Acid Sulfate Soil Samples were collected from three (3) boreholes (GBH02, GBH4 and GBH7). For the purpose of this investigation Reditus consider that sufficient sampling locations were conducted to adequately characterise the site. The number of sampling locations adheres to the NSW EPA (2022) Sampling Design Guidelines – Minimum sampling density for site characterisation for a 1.5 ha site.

8.3 Soil Sampling Methodology

Based on the CSM, soil samples were collected from the near-surface (0-0.3m), at changes in lithology or zones with any visual (staining or discolouration) or olfactory signs of contamination.

The soil samples were collected directly from the push tube. Efforts were made to minimise disturbance of the material being sampled to the extent practicable. Such techniques included removing the outside layer of material and collecting from the centre of the recovered drill cuttings, to prevent cross-contamination and minimise the potential for loss of volatile organic compounds (VOCs).

The soil samples were placed directly into a laboratory prepared 250 mL glass jar with the details of the sample, including the sample name, the job number, the date of the sample and the sample depth.

Sample preservation was undertaken in accordance with NEPC (2013) NEPM, with samples immediately placed and stored in an ice filled esky to keep them chilled, prior to being couriered to the laboratory under a signed chain of custody (COC) form filled out with the required analysis.

Each soil sample was described in general accordance with the Unified Soil Classification System (USCS) and details of any discolouration, staining, odours or other indicators of contamination were also noted.

- Samples were collected with clean new nitrile gloves to prevent cross-contamination.
- Samples were placed in an ice-filled esky to keep them below 4°C in accordance with the US EPA SW-846 method.
- Samples will be transferred to the laboratory under a completed chain-of-custody.

In summary, soil samples were collected in accordance with Reditus standard operating procedures which are based on the NEPC (2013) NEPM, Australian Standard AS4482.1-2005 and AS4482.2-1999 and EPA requirements. All samples were analysed within holding times.

8.4 Monitoring Well Installation

Newly installed monitoring wells were drilled with solid flight auger and rock coring drilling techniques. Well construction was conducted during the Douglas Partners geotechnical investigation. Details were recorded on the borehole logs.

Monitoring wells were installed to a maximum depth of 25.0 mbgl with screened interval spanning above the water table to capture potential free phase hydrocarbons.

Well construction, including screened intervals, were based on observations made during the drilling at each location. The well screens comprised of 50 mm internal diameter (ID), Class 18, threaded, flush jointed uPVC with machine slots of 0.4 mm width and casing comprised 50 mm ID, Class 18, threaded, flush jointed uPVC. Each groundwater monitoring well was gravel packed with 1-2mm of washed graded gravel to the top of the screen interval. A bentonite seal was installed above the gravel pack and cement grout was placed around the gatic cover.

All monitoring wells were developed using a combination of steel bailer and submersible pump (12V Super Twister) until majority of the sediments are removed from the water column ensuring a good connection between the screened borehole interval and the surrounding aquifer. Where practicable, a minimum quantity of three casing volumes of water was removed. The wells were then be left to stabilise prior to purging and sampling.

8.5 Groundwater Sampling

All newly installed monitoring wells were gauged using an oil/water interface probe prior to purging and sampling. Depth to standing water level (SWL) was recorded from the top of casing (TOC).

The wells were then purged using a low flow peristaltic pump until groundwater quality parameters stabilised to within 10% of the previous reading. The water quality parameters were measured with a calibrated water quality meter to record measurements for pH, redox potential, electrical conductivity (mS/cm), dissolved oxygen and temperature (˚C).

The interface probe was thoroughly decontaminated between gauging events with a phosphate free detergent (Liquinox) and rinsed with deionized water.

Groundwater samples were collected directly into appropriately preserved laboratory supplied sampling containers and labelled with the date, location, and project identification number. The samples for dissolved metals were field filtered using a 0.45-micron Millipore filter.

8.6 Laboratory Analysis and Methods

Laboratory analytical methods and analyte PQLs are shown in the analytical certificates provided in **Appendix E**. Furthermore, the analytical suites performed during this investigation are provided in **Section 5.1**.

9 Quality Assurance and Quality Control (QA/QC)

9.1 Field Quality Assurance

9.1.1 DETAILS OF SAMPLING TEAM

Fieldworks including site inspection, soil sampling and groundwater sampling were completed between 8 August and 22 August by Reditus' Graduate Environmental Scientist Tiarni Wiersma, who is suitably qualified and experienced in the collection of environmental samples.

9.1.2 DECONTAMINATION PROCEDURES CARRIED OUT BETWEEN SAMPLING EVENTS

All reusable sampling equipment was decontaminated in between each use to ensure no cross contamination occurred. Decontamination procedure involved washing of Liquinox and deionized, then rinsed with deionized water. Reditus considers this to be a suitable method to prevent cross contamination during sampling.

9.1.3 CHAIN OF CUSTODY DETAILS

All samples were transported to the laboratory under a chain of custody (COC). Information on the COC included the sampler, sample identifier, sample matrix, collection date, analyses to be performed, sample preservation method, sample release date and sample received date. COCs are provided in **Appendix F** along with the laboratory reports.

9.1.4 SAMPLING SPLITTING TECHNIQUES

Soil duplicates and triplicates were collected by taking representative samples of the soil at the same depth interval. Due to the potential loss of volatiles, samples were not mixed or homogenised during collection or splitting.

Water duplicates were collected by filling the required number of sample bottles concurrently with the primary samples to ensure that the same water was being collected in each sample container.

9.1.5 TRIP BLANKS

A trip blank was used to assess contamination from field conditions at the time of the sampling event and that the sampling procedures are adequate in preventing cross contamination of VOCs during sample transport and storage.

One (1) trip blank sample was collected during the groundwater. Samples were submitted to the laboratory for the analysis of TRH and BTEX and reported concentrations below the laboratory limit of detection.

Results of trip blank analysis is provided in **Table 6, Appendix E.**

9.1.6 STATEMENT OF DUPLICATE FREQUENCY

Field duplicates and triplicates were collected at a rate of 1:11 for soil samples and 1:4 for groundwater samples. This rate is within the Australian Standard 4482.1-2005 'Guide to the investigation and sampling of sites with potentially contaminated soil. Part 1: Non-volatile and semi-volatile compounds and Reditus' QA frequency ranges.

The following soil QA/QC samples were collected:

- DUP01 and TRIP01 were respectively soil intra-laboratory and inter-laboratory duplicates of sample BH10_0.1
- DUP02 and TRIP02 were respectively soil intra-laboratory and inter-laboratory duplicates of sample BH24_0.1.

The following groundwater QA/QC samples were collected:

- DUP1 and TRIP1 were respectively groundwater intra-laboratory and inter-laboratory duplicates of sample MW04.

9.2 Laboratory QA/QC

9.2.1 SAMPLE HOLDING TIMES

All holding times were reported as being within specified ranges.

9.2.2 LABORATORY ACCREDITATION AND ANALYTICAL METHODS USED

The primary laboratory used for samples was Envirolab Services Pty Ltd (Envirolab), while the secondary laboratory was Australian Laboratory Services Pty Ltd (ALS).

Envirolab is accredited by NATA to ISO/IEC 17025 with the accreditation number 1261, while ALS is also accredited to this standard with the accreditation number 825.

Laboratory QA/QC is provided in the laboratory reports in **Appendix F**.

9.2.3 LABORATORY CONTROL SAMPLES

Laboratory control samples were in acceptable ranges with the exception of PAHs- Chrysene, Acenaphthene, and Fluorene, and Organochlorine Pesticides- Fenitrothion and Parathion in soil. PAHs Benzo(a)pyrene and Pyrene were also outside the acceptable ranges in water control samples.

Detailed laboratory QA/QC are found in the laboratory report in **Appendix F**.

9.3 Evaluation of the QA/QC Information Compared to the DQOs

9.3.1 DOCUMENTATION COMPLETENESS:

- Soil logs, chain-of-custody forms, calibration were complete and appropriate.

Data completeness:

- All samples were received by the laboratories and analytical results reported including laboratory QA/QC.

9.3.2 DATA COMPARABILITY:

- Reditus standard operating procedures, Australian Standards and industry best practice were followed during sampling.
- Consistent field conditions and similarly trained staff were used during sampling.
- The limits of reporting are appropriate and generally consistent from each laboratory.

9.3.3 DATA REPRESENTATIVENESS:

- Reditus is confident that cross contamination has not occurred, and primary samples are representative of actual soil conditions.
- The frequency of laboratory blanks was acceptable, and the results were within specified ranges.

9.3.4 PRECISION:

- Intra-laboratory and inter-laboratory duplicates were collected at the following rates:
  - Soil and groundwater intra-laboratory and inter-laboratory duplicates frequency were collected at least 1:20.
- QA/QC sample collection rate follows the guidance provided in the Australian Standard Field procedures (AS1482.1 1997).

9.3.5 RELATIVE PERCENT DIFFERENCE

Refer to **Table 4 & Table 5, Appendix E** for Relative Percent Differences (RPDs) calculations. Reditus notes that RPDs were only calculated for groups of compounds with detections above the laboratory detection limits. RPDs for soil and groundwater were reported within acceptable ranges, with exception to the following:

- BH10_0.1 and DUP01
  - >C10-C40 Fraction (Sum) – 109%
  - Benzo(b+j+k)fluoranthene – 103%
  - Benz(a)anthracene – 100%
  - Benzo(a)pyrene – 111%
  - Benzo(g,h,i)perylene – 108%
  - Chrysene – 108%

  - Fluoranthene – 104%
  - Indeno(1,2,3-c,d)pyrene – 111%
  - Phenanthrene – 120%
  - Pyrene – 96%
  - Total PAHs (Sum of positives) – 104%
  - Chromium – 75%
  - Copper – 95%
  - Lead – 95%
  - Nickel – 82%
  - Zinc – 99%
- BH10_0.1 and TRIP01
  - Zinc – 43%
- BH24_0.1 and DUP2
  - Total PAHs (Sum of positives) – 140%
  - Copper – 73%
  - Lead – 35%
  - Zinc – 40%
- BH24_0.1 and TRIP2
  - Copper – 49%
  - Lead – 135%
  - Zinc – 33%

Reditus considers that these RPD exceedances are likely to be due to the heterogeneity of sampled soil. Reditus hence does not consider that these RPD exceedances have affected the integrity of the analytical results.

RPDs for groundwater were reported within acceptable ranges with the exception of the following:

- MW04 and TRIP1
  - >C10-C40 Fraction (Sum) – 120%
  - C10-C36 Fraction (Sum) – 117%

Reditus considers that these RPD exceedances are due to the reported concentrations being relatively low (<10 time LOR) where marginal differences in concentrations result in exaggerated %RPD. The reported concentrations of both the primary and duplicate samples were below the adopted site criteria and not considered to affect the outcome of the assessment. Reditus hence does not consider that these RPD exceedances have affected the integrity of the analytical results, which are considered suitable for this assessment.

10 Results

10.1 Field Observations

10.1.1 SOIL

Soil samples collected from the boreholes were logged in general accordance with the USCS. The geology was described as follows:

- **Fill/Topsoil:** (thickness ranging from 0.0–0.3 m): SAND, Clayey SAND and Sandy CLAY; loose to firm, medium plasticity clay, dark brown with mottled yellow, fine to coarse grained, dry, no odour, anthropogenic material or staining.
- **Natural (Residual):** (at depths starting at 0.2 m): SAND, Silty CLAY, CLAY; soft to firm, fine to coarse grained sand, low plasticity, dark brown with orange and red mottled, inorganic, dry, no odour, anthropogenic material or staining. some rootlets present.

No hydrocarbon odours or staining were noted in soils during sample collection.

In addition, there was no asbestos containing materials (ACM) observed in any of the boreholes or soil samples collected or the ground surface during the site inspection completed concurrently with the soil sampling.

10.1.2 GROUNDWATER

All groundwater monitoring wells were gauged for standing water level (SWL) and total depth on 28 August 2024 prior to commencing purging and sampling. The groundwater gauging data is summarised in

Table 10-1.

Table 10-1 Groundwater Gauging Data

Well ID	LOCATION	DEPTH (mbTOC)	SWL (mbTOC)	SWL (mAHD
MW01	North-west	24.70	6.46	11.993
MW03	South-west	16.10	9.835	2.488
MW04	South-east	7.60	2.345	6.3
MW06	North-east	18.10	2.24	11.571

The monitoring wells were purged until stabilised physiochemical parameters were obtained, which are summarised in **Table 10-2** below.

Table 10-2 Stabilised Groundwater Physiochemical Properties

Well ID	pH	TEMP (ºC)	EC (mS/CM)	DO (ppm)	REDOX (mV)	COMMENTS
MW01	7.78	19.9	1.920	-	223.7	Pale grey/brown, no odour/sheen, slightly turbid
MW03	7.51	19.75	2.644	2.64	229.9	Grey/brown, no odour/sheen, turbid
MW04	6.26	19.4	5.481	1.17	287.0	Clear, no odour/sheen
MW06	8.40	21.06	2.933	-	228.9	Clear, no odour/sheen

Note: 199mV have been added to redox field values to adjust to Standard Hydrogen Electrode (SHE) results.

Due to peristaltic-pump purge failure at depth within MW03, only grab samples were able to be collected.

Based on the physico-chemical parameters recorded during the groundwater monitoring event the following observations have been made:

- pH indicates a relatively neutral environment in the shallow aquifer underlying the site.
- Electrical conductivity readings indicated a brackish groundwater environment with dissolved salt and inorganics in relatively high concentrations.
- Dissolved oxygen indicates moderate to low levels of dissolved oxygen in the shallow aquifer underlying the site.
- ORP indicates an oxidising environment is present in the shallow groundwater aquifer onsite.

10.2 Soil Analytical Results

A summary of the soil analytical results can be found in **Table 1, Appendix E**. The following section outlines the key findings of the comparison between laboratory results and the site assessment criteria. Discussion of analytical results is provided in **Section 10.3** below.

Soil sample locations are shown in **Figure 2, Appendix A**.

10.2.1 HEAVY METALS

Concentrations of metals were reported above the adopted assessment criteria for copper and zinc at the following locations:

- **Copper:** BH05_0.1 (280 mg/kg) and BH21_0.2 (430 mg/kg) above the NEPM (2013) EIL for urban residential and public open space (220 mg/kg).
- **Zinc:** BH21_0.2 (480 mg/kg) above the NEPM (2013) EIL for urban residential and public open space (460 mg/kg)

10.2.2 TRH & BTEXN

Concentration of TRH and BTEXN were reported below the adopted assessment criteria with the exception of TRH-F3 at location BH05_0.1 (340 mg/kg) above the ecological screening level criteria (300 mg/kg).

10.2.3 PAH

Concentrations of PAHs were reported above the adopted assessment criteria for benzo(a)oyrene) at the following locations:

- **Benzo(a)pyrene)**: BH05_0.1 (2.4 mg/kg) above the NEPM (2013) ESL for commercial and industrial (coarse soil) (1.4 mg/kg).

10.2.4 OCPS, OPPS & PCBS

Concentrations of OCP/OPP were reported below the adopted assessment criteria in all soil samples submitted for analysis.

10.2.5 ASBESTOS

No asbestos was detected in all soil samples submitted for identification analysis.

10.3 Acid Sulfate Soil Assessment

As the site has been identified as being within a Class 5 Acid Sulfate Soil (ASS) zone and 4 level basement is proposed at the site, chromium reducible sulfur (CrS) suite analysis was undertaken on selected samples and the results have been compared against the *Action Criteria* from Table 4.4 in the ASSMAC (1998) as well as the NASS (2018). It is noted that the predominant soil type encountered during the intrusive investigation works at the site was clay, therefore 'fine texture – light medium to heavy clays' material type has been adopted.

Laboratory analytical results for CrS compared to the adopted *Action Criteria* is presented in **Table 10-3** below as well as attached in **Table 3, Appendix E**.

Table 10-3 ASS / PASS Assessment Summary

SAMPLE ID	ACTION CRITERIA (>1000 TONNES) FINE TEXTURE MATERIAL		COMMENT
	SULFUR TRAIL (% S)	ACID TRAIL (MOL H^+/t)	
	0.03	**18**	
GBH02_7.0	0.018	12	-
GBH02_9.0	0.013	8	-
GBH02_12.0	<0.005	<5	-
GBH4_5.0	0.014	8.8	-
GBH4_10.0	0.008	<5	-
GBH4_15.0	**0.041**	**26**	Sample exceeded the action criteria for acid sulfate soils
GBH7_7.0	0.010	6.5	-
GBH7_9.0	**0.062**	**38**	Sample exceeded the action criteria for acid sulfate soils

Laboratory results from assessed samples indicate the presence of potential acid sulfate soils (PASS) on site at location GBH7_9.0 and GBH4_15.0. Samples were taken primarily in extremely weathered shale through to component shale bedrock. Shale bedrock material showed acid bearing capacity from the assessed results. Although such material doesn't inherently require management, environment controls are recommended for the handling of this material at the time of excavation. Due to the depth at which acidic conditions were encountered consideration of the impact acidic conditions pose to the proposed development should also be made prior to the construction phase of

the development (i.e., salinity and erosion management). Other lab methodologies can provide the acid bearing potential of such rock lithologies.

10.4 Groundwater Analytical Results

A summary of the groundwater analytical results compared to the site assessment criteria can be found in **Table 2, Appendix E** This section outlines the key findings of the comparison between laboratory results and the site assessment criteria as summarised in the subsections below.

10.4.1 METALS

Concentrations of metals were reported above the adopted assessment criteria for chromium, nickel and zinc at the following locations:

- **Chromium (III+IV):** MW01 (11 µg/L) above the ANZG (2018) 95% marine criteria (4.4 µg/L)
- **Nickel:** MW04 (180 µg/L) above the ANZG (2018) 95% marine criteria (70 µg/L).
- **Zinc:** MW01 (23 µg/L), MW04 (560 µg/L) and MW06 (73 µg/L) above the ANZG (2018) 95% marine criteria (8 µg/L).

10.4.2 TRH

Concentrations of TRHs were reported below the adopted assessment criteria in all groundwater samples submitted for analysis.

10.4.3 BTEXN

Concentrations of BTEXN were reported below the adopted assessment criteria in all groundwater samples submitted for analysis.

10.4.4 PAH

Concentrations of PAHs were reported below the adopted assessment criteria in all groundwater samples submitted for analysis.

10.5 Extent of Uncertainties in the Results

The sampling methodologies used by Reditus during this investigation has been designed to limit uncertainty in the results. Reditus is confident that the results of this investigation give an accurate representation of the current status of the site but note that in all subsurface investigations the potential remains for variability between sampling points and for conditions to be different onsite from the conditions reported herein.

11 Discussion

11.1 Discussion of Soil Results

11.1.1 HEALTH INVESTIGATION LEVELS (HIL-B)

The results of the laboratory analysis and statistical analysis indicate that the concentrations of the contaminants of potential concern in soil at each sample location were below the applicable adopted NEPC (2013) NEPM HIL-B guidelines.

11.1.2 HEALTH SCREENING LEVELS (HSLS) FOR VAPOUR INTRUSION (HSL-A&B)

The results of the laboratory analysis indicate that the concentrations of the contaminants of potential concern in soil at each sample location were below the applicable adopted NEPC (2013) HSL-A&B assessment criteria for vapour intrusion.

11.1.3 HUMAN HEALTH ASBESTOS (HSL-B)

The results of the laboratory analysis indicate that the concentrations of FA and AF at each sample location were reported below the applicable adopted NEPC (2013) HSL-B assessment criteria. All results were below the laboratory detection limit.

11.1.4 MANAGEMENT LIMITS

The results of the laboratory analysis indicate that the concentrations of the contaminants of potential concern were below the adopted Management Limits.

11.1.5 ECOLOGICAL INVESTIGATION LEVELS

The results of the laboratory analysis indicate that the concentrations of the contaminants of potential concern were above the adopted EIL for the following analytes:

- Copper: BH05_0.1 (280 mg/kg) and BH21_0.2 (430 mg/kg)
- Zinc: BH21_0.2 (480 mg/kg)

95% UCL calculations were conducted for copper and zinc using OpenUCL. The results indicated that the normal 95% UCL distribution (Student t-test) was below the adopted criteria for copper and zinc. Standard deviation (SD) was below 50% of the Tier 1 criteria and no one result was above 250% of the Tier 1 criteria. However, management may still be required.

11.1.6 ECOLOGICAL SCREENING LEVELS

The results of the laboratory analysis indicate that the concentrations of the contaminants of potential concern were above the adopted ESL for the following analyte:

- Benzo(a)pyrene): BH05_0.1 (2.4 mg/kg) and BH12_0.15 (1.2 mg/kg)

95% UCL calculations were conducted for benzo(a)pyrene using OpenUCL. The results indicated that the normal 95% UCL distribution (Student t-test) was below the adopted Tier 1 criteria.

11.2 Extent of Uncertainties in the Results

The sampling methodologies used by Reditus during this investigation has been designed to limit uncertainty in the results. Reditus is confident that the results of this investigation give an accurate representation of the current status of the surface soils onsite but note that in all subsurface investigations the potential remains for variability between sampling points and for conditions to be different on site from the conditions reported herein.

12 Refined Conceptual Site Model

Based on the results of the investigation and the preliminary CSM presented in **Section 5** has been refined to identify complete and potential pathways between the known or potential source(s) and the receptor(s).

Table 12-1 Refined Conceptual Site Model

SOURCE	EXPOSURE PATHWAY	RECEPTOR	EXPOSURE
Historical importation of fill materials *Importation of fill from an unknown source or from adjacent site activities.*	• Direct contact with contaminated soils during sub-surface works at the site (i.e., trenching and/or excavation works) or by future users of the area. • Inhalation of dust and vapours. • Surface water run-off.	• Construction Workers. • Site occupants. • Maintenance workers attending the site, particularly if works require excavation, trenching or any activities applicable to the sub-surface of the site.	**Unlikely** The assessment of shallow fill within this PSI/DSI sampling demonstrate that a "source" of soil contamination is not present. All soil results were below the Tier 1 human health criteria. However, there is a possibility for contamination to exist below existing building footprints.
Hazardous Building Materials *Weathering of hazardous building materials.*	• Direct contact with contaminated soils during sub-surface works at the site (i.e., trenching and/or excavation works) or by future users of the area. • Inhalation of dust and vapours. • Surface water run-off.	• Construction Workers. • Site occupants. • Maintenance workers attending the site, particularly if works require excavation, trenching or any activities applicable to the sub-surface of the site.	**Possible** Identified ACMs and lead paint to be controlled during demolition of existing structures in accordance with AS2601-2001
Former manufacturing processes *Off-site migration of hazardous chemicals through groundwater*	• Direct contact with contaminated groundwater during sub-surface excavations (i.e., construction of basement carpark) • Inhalation of dust and vapours. • Ingestion of potentially contaminated soil and groundwater.	• Construction Workers. • Site occupants. • Maintenance workers[1]	**Unlikely** The assessment of groundwater sampling results within this PSI/DSI demonstrate that a source of groundwater contamination is not present. All results were below the human health criteria.

13 Conclusions and Recommendations

The following conclusions and recommendations are made based on the key findings of the combined PSI/DSI.

13.1 Conclusions

Based on a review of the site history, observations made during fieldwork, results of laboratory analysis and the proposed land use scenario (Residential development with basement car parking and limited access to soils), Reditus concludes the following:

- Historical sources of potential contaminated noted during the desktop investigation included importation of fill material of unknown quality, weathering of hazardous building materials and former manufacturing processes from surrounding properties.
- Natural material was noted in boreholes to depths ranging between 0.2-0.3 mBGL.
- Hydrocarbon odours, staining and asbestos containing materials were not observed or identified in any of the soil samples during intrusive works.
- Four (4) groundwater monitoring wells were installed to a maximum depth of 25.0 mbgl. Groundwater was observed to be grey/brown to clear with no odour or sheen.
- Concentrations of CoPC in soil were reported below the applicable site assessment criteria with the exception of benzo(a)pyrene at BH05 (0.1 mBGL), BH12 (0.15 mBGL) and DUP01 (Duplicate of BH10_0.1), and TRH-F3 at BH05_0.1 above the ecological screening level criteria. Copper at location BH05 (0.1 mBGL) and BH21 (0.2 mBGL) as well as Zinc at BH21 (0.2 mBGL) were above the ecological investigation level criteria. No asbestos was detected in any of the soil samples analysed.
- Potential acid sulfate rock was identified on site within shale bedrock at GBH4 (15.0 mBGL) and GBH7 (9.0 mBGL). Although such material doesn't affect the proposed land use, environment controls may be required for the handling acidic bedrock during bulk excavation. Noting the site is within a Class 5 area in which acid sulfate soils are not typically present. The laboratory analysis reported isolated occurrences of net acidity and sulfidic acidity marginally above the ASSMAC 1998 criteria, however net acidity was below criteria when considered with the naturally occurring acid neutralising capacity of the bedrock.

13.2 Recommendations

Based on the above, Reditus considers that the site is suitable for the proposed development (residential towers with 4 levels of basement carparking and commercial use on ground levels) subject to implementation of the following recommendations:

- Completion of a pre-demolition hazardous materials (HAZMAT) survey of buildings constructed prior to 2004 in accordance with Australian Standard AS2601-2001 Demolition of Structures. There is a moderate potential for hazardous building materials to be detected within the site structures.
- The identified hazardous materials should be removed and demolition of structures must be undertaken in accordance with the NSW WHS Act, Chapter 8 of the WHS Regulation and SafeWork NSW Codes of Practice and preparation of an Asbestos Management Plan to inform the removal of asbestos containing building materials and lead paint in accordance with SafeWork NSW requirements including clearance certificates provided by a SafeWork NSW Licensed Asbestos Assessor or "Competent Person" as defined by the Code of Practice.
- Following the removal of existing structures and any identified hazardous building materials, analysis of deeper natural soil will be required for offsite disposal in accordance with the NSW EPA (2014) Waste Classification Guidelines. All soils taken offsite for disposal must have waste classifications completed accordance with the NSW EPA (2014) Waste Classification Guidelines. Disposal of site soils must be undertaken in accordance with the NSW POEO Act 1997, POEO (Waste) Regulation 2014 and applicable resource recovery orders.
- The shallow fill soils at BH05, BH10, BH12 and BH21 are required to be removed or managed due to the exceedance of benzo(a)pyrene, copper, zinc and TRH-F3. It is assumed that the soils will be removed as part of the bulk excavation works however, if the soils within this area are to remain onsite, they will require remediation through removal or management of the soils. This will be confirmed after a review of the finalised design of the site is performed.

- Develop an unexpected finds protocol to be implemented during earthworks. This will detail the methods and procedures required to be followed, if during contamination is identified during bulk excavation (e.g. beneath existing structures). Given the detailed site investigation did not identify sources of contamination there is low potential for unexpected finds to occur during the construction phase of the proposed development.
- Dewatering of groundwater shall comply with an approved Dewatering Management Plan to be prepared in accordance with the NSW DPE (2022) Minimum Requirements for Building Site Groundwater Investigations and Reporting guidelines and the Water NSW Mandatory Assessment Requirements for "Application for approval for water supply works, and/or water use".
- Prior to excavation, additional characterisation of potentially acidic bedrock (between 9 to 15 mbgl) will be undertaken to identify whether management of acid sulfate soils is required during bulk excavation and piling works.

14 Limitations

This report has been prepared in accordance with the scope of services described in the **Section 1.3**. The letter has been prepared for the sole use of the client and has been prepared in accordance with a scope of work agreed by the client.

The report or document does not purport to provide legal advice and any conclusions or recommendations made should not be relied upon as a substitute for such advice.

The report does not constitute a recommendation by Reditus for the client or any other party to engage in any commercial or financial transaction and any decision by the client or other party to engage in such activities is strictly a matter for the client.

The report relies upon data, surveys, measurements and results taken at or under the site at particular times and conditions specified herein. Any findings, conclusions or recommendations only apply to the aforementioned circumstances and no greater reliance should be assumed or drawn by the client. Furthermore, the report has been prepared solely for use by the client and Reditus accepts no responsibility for its use by other parties. The client agrees that Reditus' report or associated correspondence will not be used or reproduced in full or in part for promotional purposes and cannot be used or relied upon by any other individual, party, group or company in any prospectus or offering. Any individual, party, group or company seeking to rely on this report cannot do so and should seek their own independent advice.

No warranties, express or implied, are made. Subject to the scope of work undertaken, Reditus assessment is limited strictly to identifying typical environmental conditions associated with the subject property based on the scope of work and testing undertaken and does not include and evaluation of the structural conditions of any buildings on the subject property or any other issues that relate to the operation of the site and operational compliance of the site with state or federal laws, guidelines, standards or other industry recommendations or best practice. Scope of work undertaken for assessments are agreed in advance with the client and may not necessarily comply with state or federal laws or industry guidelines for the type of assessment conducted.

Additionally, unless otherwise stated Reditus did not conduct soil, air or wastewater analyses including asbestos or perform contaminated sampling of any kind. Nor did Reditus investigate any waste material from the property that may have been disposed off-site or undertake and assessment or review of related site waste management practices.

The results of this assessment are based upon (if undertaken as part of the scope work) a site inspection conducted by Reditus personnel and/or information from interviews with people who have knowledge of site conditions and/or information provided by regulatory agencies. All conclusions and recommendations regarding the property are the professional opinions of the Reditus personnel involved with the project, subject to the qualifications made above.

While normal assessments of data reliability have been made, Reditus assumes no responsibility or liability for errors in any data obtained from regulatory agencies, statements from sources outside of Reditus, or developments resulting from situations outside the scope of this project/assessment.

Reditus is not engaged in environmental auditing and/or reporting of any kind for the purpose of advertising sales promoting, or endorsement of any client's interests, including raising investment capital, recommending investment decisions, or other publicity purposes. Reditus assumes no responsibility or liability for errors in any data obtained from regulatory agencies, statements from sources outside of Reditus, or developments resulting from situations outside the scope of this project.

In relation the conduct of asbestos inspections or the preparation of hazardous materials reports Reditus has conducted inspections and the identification of hazardous material within the constraints presented by the property. Whilst efforts are made to access areas not normally accessed during normal use of the site to identify the presence of asbestos or other hazardous material, unless explicitly tested no guarantee can be provided that such material is or is not present.

Reditus' professional opinions are based upon its professional judgment, experience, and training. These opinions are also based upon data derived from the limited testing and analysis described in this report or reports reviewed. It is possible that additional testing and analysis might produce different results and/or different opinions or other opinions. Reditus has limited its investigation(s) to the scope agreed upon with its client. Reditus believes that its opinions are reasonably supported by the testing and analysis that has been undertaken (if any), and that those opinions have been developed according to the professional standard of care for the environmental consulting

profession in this area at this time. Other opinions and interpretations may be possible. That standard of care may change and new methods and practices of exploration, testing and analysis may develop in the future, which might produce different results.

15 References

Environmental Planning

NSW Environmental Planning and Assessment Act (the EP&A Act 1979).

NSW State Environmental Planning Policy Number (SEPP) Resilience and Hazards 2021. Superseding SEPP55 – Remediation of Land, 1998.

Site Contamination

CRC Care (2011) Health screening levels for petroleum hydrocarbons in soil and groundwater. Part 1: Technical development document.

NSW Contaminated Land Management Act (the CLM Act 1997).

NSW EPA statutory guidelines made or approved under section 105 of the CLM Act, including:

- *NSW EPA Guidelines for the NSW Site Auditor Scheme (3rd Edition), 2017.*
- *NSW EPA Guidelines for Consultants Reporting on Contaminated Land, 2020.*
- *NSW EPA Sampling Design Guidelines, August 2022.*
- *NSW EPA Guidelines for the Assessment and Management of Groundwater Contamination, 2007.*
- *NSW EPA Guidelines for Assessment and Management of Hazardous Ground Gases, 2020.*

National Environment Protection Council (1999, Revised 2013) National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 – Schedule B1 Guideline on Investigation levels for Soil and Groundwater (NEPC, 2013).

Australian and New Zealand Governments Guidelines for Fresh and Marine Water Quality 2018.

Australian Standard AS4482.1-2005. Guide to the Investigation and Sampling of sites with Potentially Contaminated Soil. Part 1: Non-volatile and Semi-volatile Compounds, 2005.

Australian Standard AS4482.2-1999. Guide to the Investigation and Sampling of sites with Potentially Contaminated Soil. Part 2: Volatile Substances,1999.

PFAS National Environmental Management Plan version 2.0 (the PFAS NEMP 2.0), 2020.

Acid Sulfate Soils

The Acid Sulfate Soil Management Advisory Committee (ASSMAC) Acid Sulfate Soils Assessment Guidelines 1998 (Also referred to as the "Acid Sulfate Soils Manual").

Waste

NSW Protection of the Environment Operations Act (POEO Act) 1997.

NSW Protection of the Environment Operations (Waste) Regulations 2014.

NSW EPA Waste Classification Guidelines, Part 1 Classifying Waste, 2014.

NSW EPA Resource Recovery Order, Excavated Natural Material Order under Part 9, Clause 93 of POEO Waste Regulation 2014 (the ENM Order 2014).

Asbestos

NSW Work Health and Safety Act, 2011 (WHS Act 2011).

NSW Work Health and Safety Regulations, 2017 (WHS Reg 2017), Chapter 8 Asbestos, 2017 (NSW WHS Reg 2017).

NSW EPA Managing Asbestos in or on Soil, 2014 (NSW EPA 2014).

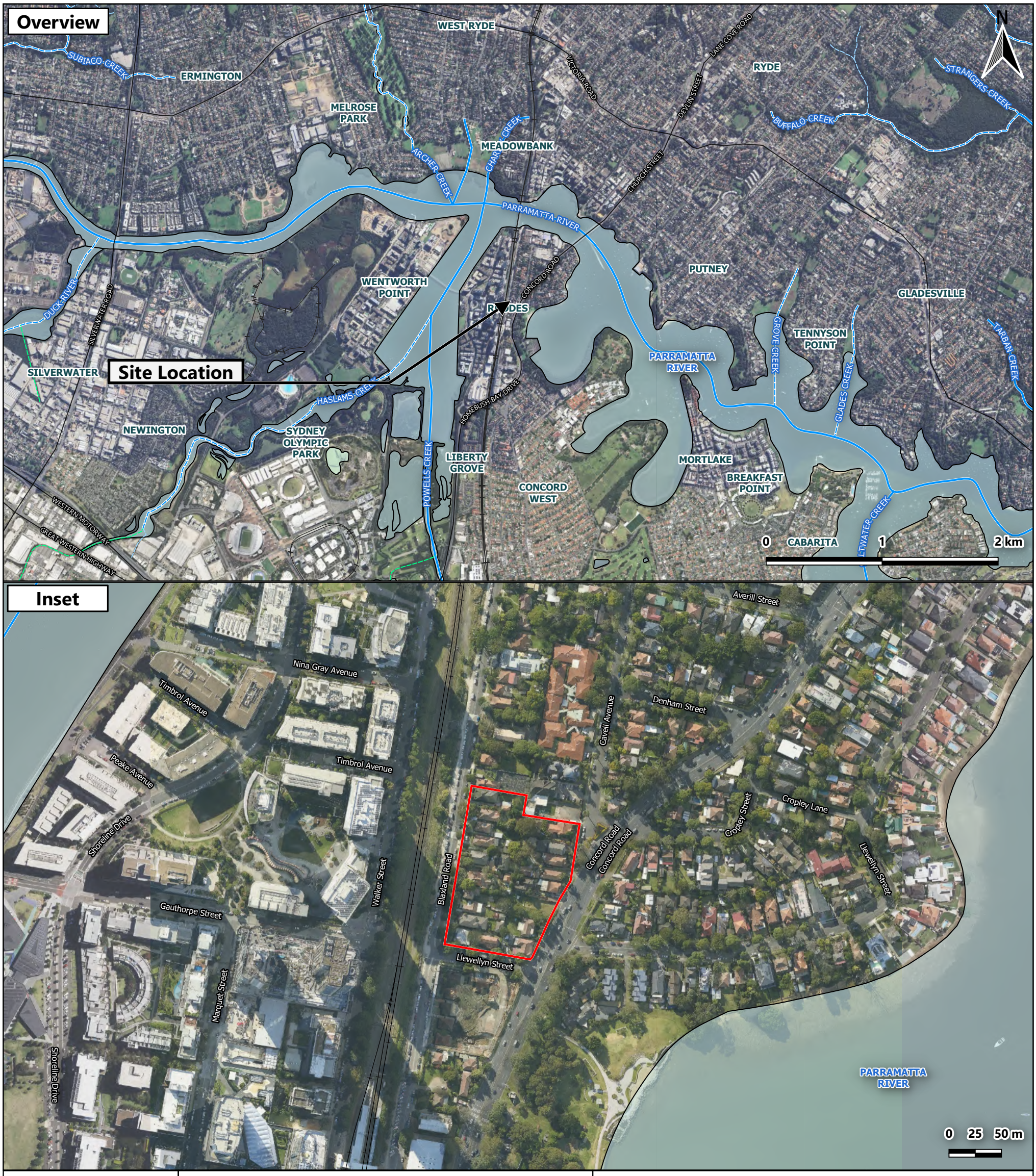
Western Australia Department of Health Guidelines for the Assessment Remediation and Management of Asbestos Contaminated Sites in Western Australia 2009 (WA DoH, 2009) as referred to by NEPM 2013Environmental Planning

A

Figures



REDITUS



Map	
24109_rp01_f01_siteloc_v01	
Date of Export	
09/09/2024	
Author	**Approver**
TG	DS
Data Source	
Metromap, Google Maps	

Legend

- Site Boundary
- Major Roads
- Railways
- Surface Water

Watercourses

- Rivers
- Stream (Perennial)
- Stream (Non-Perennial)
- Unnamed Stream (Non-Perennial)
- Other Channels

Figure 1 - Site Location

2A Llewellyn St, 43 – 57 Blaxland Rd and 2A, 2B and 2D Cavell Ave, Rhodes NSW

24109 - Preliminary & Detailed Site Investigation

Leeds Investment Pty Ltd

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Map	
24109_rp01_f02_samplelocs_v01	
Date of Export	**Map Scale (approx. at A3)**
11/09/2024	1:800
Author	**Approver**
TW	DS
Data Source	
Metromap, Google Maps, Open Street Map, Geoscience Australia	

Legend

- Site Boundary
- Lot Boundaries
- Borehole Sample Locations

Figure 2 - Sample Locations

2A Llewellyn St, 43 – 57 Blaxland Rd and 2A, 2B and 2D Cavell Ave, Rhodes NSW

24109 - Preliminary & Detailed Site Investigation

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B

Photo Board



APPENDIX B SITE PHOTOGRAPHS		
Report Title Preliminary Site Investigation and Detailed Site Investigation		
Client Name Leeds Investment Pty Ltd	Site Location 2A Llewellyn St, 43 – 57 Blaxland Rd and 2A, 2B and 2D Cavell Ave, Rhodes NSW	Project Number 24109

Photo No.	Date
1	29/07/2024

Direction Facing

West

Description

Building Material located within the front yard of a residential dwelling located at 53 Blaxland Road.



Photo No.	Date
2	29/07/2024

Direction Facing

-

Description

Location of BH01.



APPENDIX B SITE PHOTOGRAPHS		
Report Title Preliminary Site Investigation and Detailed Site Investigation		
Client Name Leeds Investment Pty Ltd	Site Location 2A Llewellyn St, 43 – 57 Blaxland Rd and 2A, 2B and 2D Cavell Ave, Rhodes NSW	Project Number 24109

Photo No.	Date
3	29/07/2024

Direction Facing

-

Description

Representative images of the sandy fill located across many boreholes (left) and the underlying natural clay (right).



Photo No.	Date
4	8/08/2024

Direction Facing

-

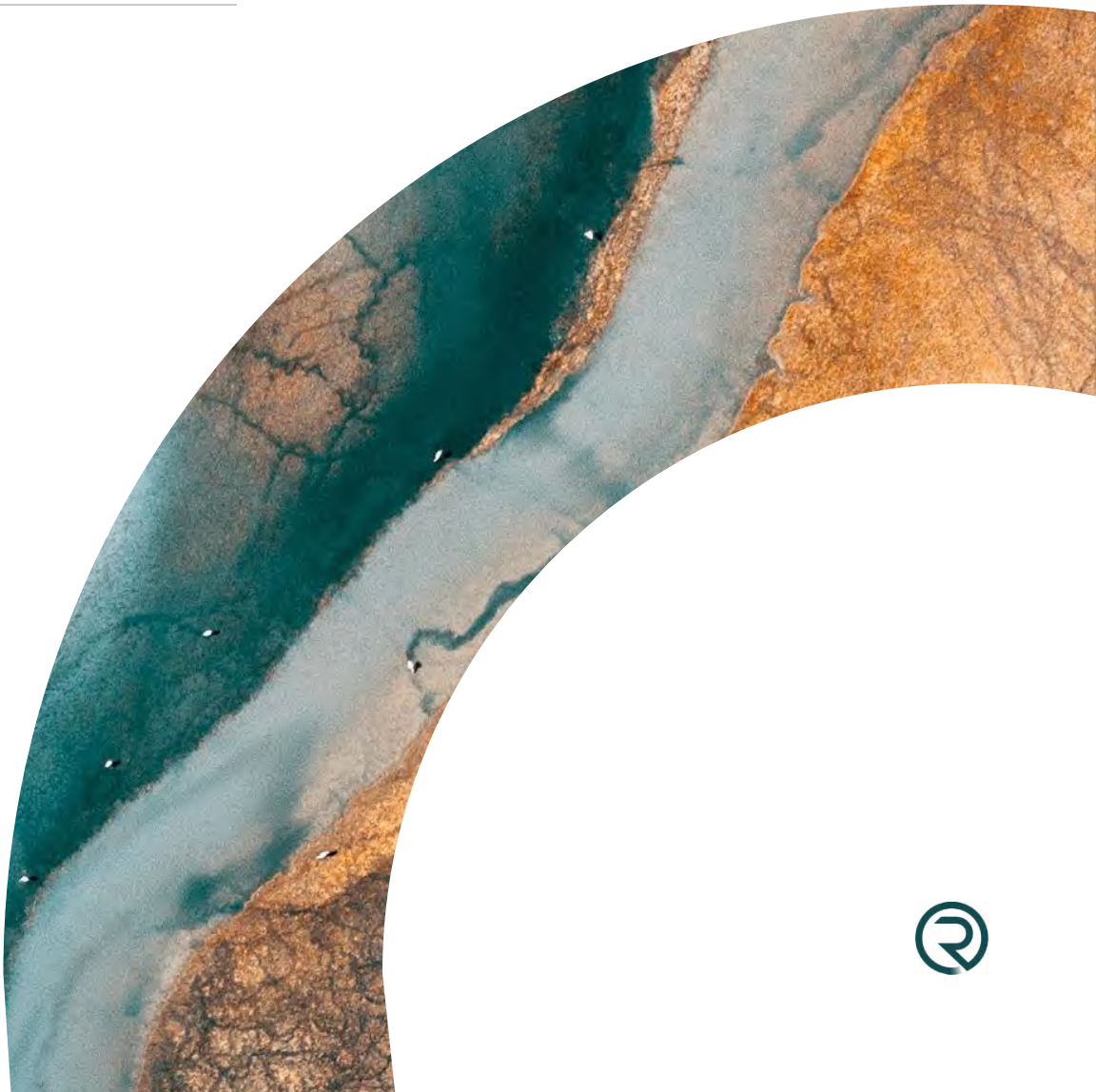
Description

Large gravels located within the fill at the vacant lot (452 Concord Road)



C

Site History Searches



REDITUS

Desktop Searches

Site Overview

2 Llewellyn Street, Rhodes NSW 2138



Legend

- Site Boundary
- 1km Site Boundary Perimeter Buffer
- Cadastral Lot Boundaries

0 20 40 m

Scale	Date of Export
1:2,000	29/04/2024

Data Sources

Bureau of Meterology, Google Maps, NSW Government

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Desktop Searches

Cadastral Lot Boundaries

2 Llewellyn Street, Rhodes NSW 2138



Legend

- Site Boundary
- 1km Site Boundary Perimeter Buffer
- Cadastral Lot Boundaries

0 20 40 m

Scale	Date of Export
1:2,000	29/04/2024

Data Sources

Bureau of Meterology, Google Maps, NSW Government

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Desktop Searches

Local Geographic Features

2 Llewellyn Street, Rhodes NSW 2138



Legend

- Site Boundary
- 1km Site Boundary Perimeter Buffer
- Localities/Suburbs
- Motorway
- Road
- Railways

0 100 200 m

Scale	Date of Export
1:11,000	29/04/2024

Data Sources

Bureau of Meterology, Google Maps, NSW Government

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REDITUS

Desktop Searches

Sensitive Human Environments

2 Llewellyn Street, Rhodes NSW 2138



Legend

- Site Boundary
- 1km Site Boundary Perimeter Buffer
- Sensitive Environments (Limited)

0 100 200 m

Scale 1:11,000

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REDITUS

Desktop Searches

National Parks and State Forests

2 Llewellyn Street, Rhodes NSW 2138



Legend

- Site Boundary
- 1km Site Boundary Perimeter Buffer

0 100 200 m

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REDITUS

Desktop Searches

EPI Environmentally Sensitive Land

2 Llewellyn Street, Rhodes NSW 2138



Legend

- Site Boundary
- 1km Site Boundary Perimeter Buffer

EPI Environmentally Sensitive Land Class

- Environmentally Sensitive Land

0 100 200 m

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Features within Map Extent

EPI Name	EPI Type	Amendment	Sensitive Land Class
Canada Bay Local Environmental Plan 2013	LEP	Map Amendment No 2	Environmentally Sensitive Land

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2 Llewellyn Street, Rhodes NSW 2138



Legend

- Site Boundary
- 1km Site Boundary Perimeter Buffer

0 100 200 m

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Features within Map Extent

ID	EPI	Map Name	Layer Name	Layer Class	Comments
No Records Within Map Extent					

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Desktop Searches

EPI Native Vegetation Protection

2 Llewellyn Street, Rhodes NSW 2138



Legend

- Site Boundary
- 1km Site Boundary Perimeter Buffer

0 100 200 m

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Data Sources

Bureau of Meterology, Google Maps, NSW Government

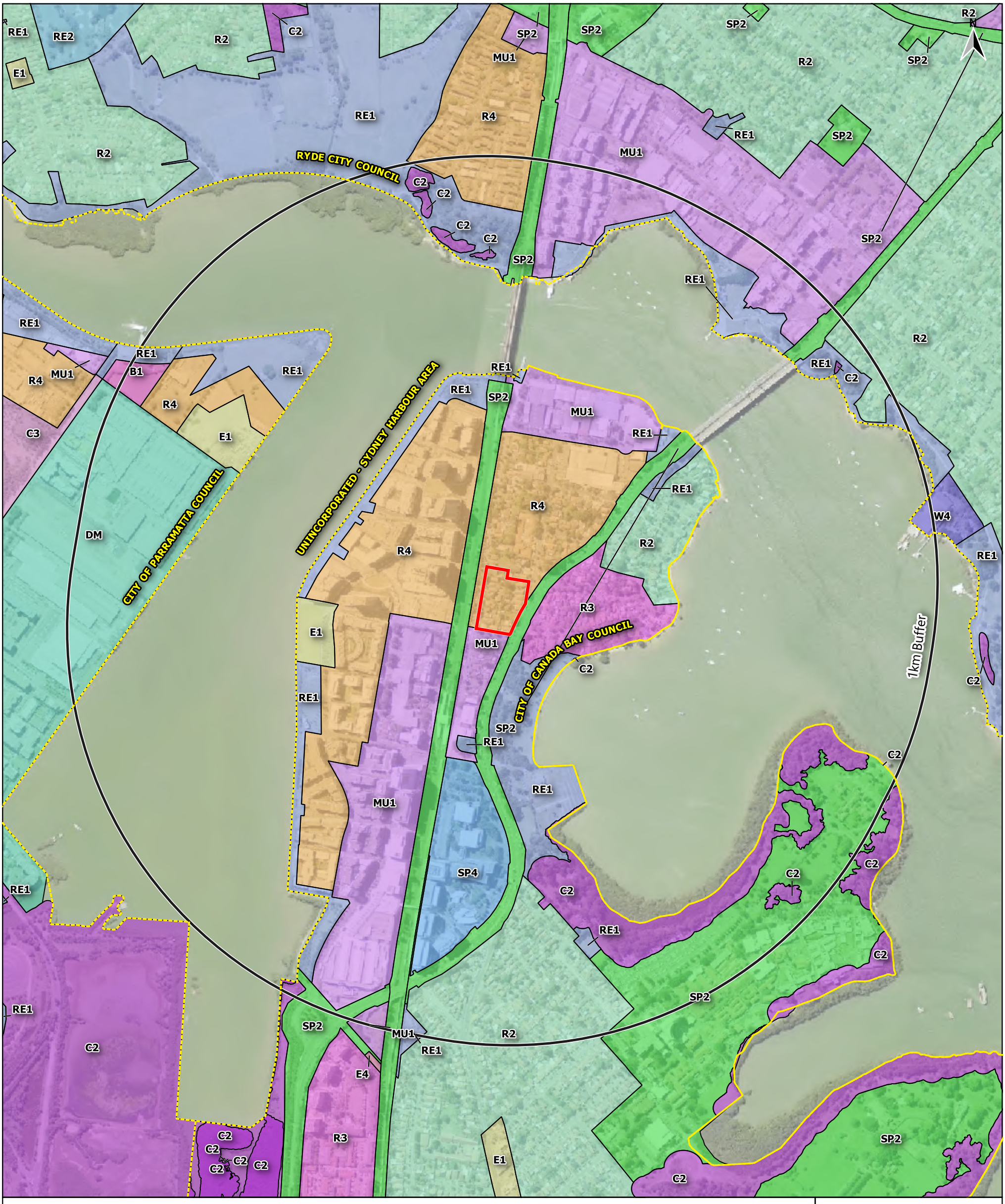
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REDITUS

Desktop Searches

Zoning

2 Llewellyn Street, Rhodes NSW 2138



Legend

- Site Boundary
- 1km Site Boundary Perimeter Buffer
- Local Government Area Boundary

- B1 - Neighbourhood Centre
- C2 - Environmental Conservation
- C3 - Environmental Management
- DM - Deferred Matter
- E1 - Local Centre
- E4 - General Industrial
- MU1 - Mixed Use
- R2 - Low Density Residential
- R3 - Medium Density Residential
- R4 - High Density Residential
- RE1 - Public Recreation
- RE2 - Private Recreation
- SP2 - Infrastructure
- SP4 - Enterprise
- W4 - Working Waterfront

0 100 200 m

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Bureau of Meterology, Google Maps, NSW Government

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Features within Map Extent

Zoning Code	Zoning Class	Planning Instrument	Local Government Area
C2	Environmental Conservation	Canada Bay Local Environmental Plan 2013	CANADA BAY
C2	Environmental Conservation	State Environmental Planning Policy (Precincts—Central River City) 2021	CANADA BAY
E1	Local Centre	Canada Bay Local Environmental Plan 2013	CANADA BAY
E4	General Industrial	Canada Bay Local Environmental Plan 2013	CANADA BAY
MU1	Mixed Use	Canada Bay Local Environmental Plan 2013	CANADA BAY
R2	Low Density Residential	Canada Bay Local Environmental Plan 2013	CANADA BAY
R3	Medium Density Residential	Canada Bay Local Environmental Plan 2013	CANADA BAY
R4	High Density Residential	Canada Bay Local Environmental Plan 2013	CANADA BAY
RE1	Public Recreation	Canada Bay Local Environmental Plan 2013	CANADA BAY
SP2	Infrastructure	Canada Bay Local Environmental Plan 2013	CANADA BAY
SP4	Enterprise	Canada Bay Local Environmental Plan 2013	CANADA BAY
B1	Neighbourhood Centre	State Environmental Planning Policy (Precincts—Central River City) 2021	CITY OF PARRAMATTA
C2	Environmental Conservation	State Environmental Planning Policy (Precincts—Central River City) 2021	CITY OF PARRAMATTA
C3	Environmental Management	State Environmental Planning Policy (Precincts—Central River City) 2021	CITY OF PARRAMATTA
DM	Deferred Matter	Parramatta Local Environmental Plan 2023	CITY OF PARRAMATTA
E1	Local Centre	Parramatta Local Environmental Plan 2023	CITY OF PARRAMATTA
MU1	Mixed Use	Parramatta Local Environmental Plan 2023	CITY OF PARRAMATTA
R4	High Density Residential	Parramatta Local Environmental Plan 2023	CITY OF PARRAMATTA
RE1	Public Recreation	State Environmental Planning Policy (Precincts—Central River City) 2021	CITY OF PARRAMATTA
RE1	Public Recreation	Parramatta Local Environmental Plan 2023	CITY OF PARRAMATTA
C2	Environmental Conservation	Ryde Local Environmental Plan 2014	RYDE
E1	Local Centre	Ryde Local Environmental Plan 2014	RYDE
MU1	Mixed Use	Ryde Local Environmental Plan 2014	RYDE
R2	Low Density Residential	Ryde Local Environmental Plan 2014	RYDE
R4	High Density Residential	Ryde Local Environmental Plan 2014	RYDE
RE1	Public Recreation	Ryde Local Environmental Plan 2014	RYDE
RE2	Private Recreation	Ryde Local Environmental Plan 2014	RYDE
SP2	Infrastructure	Ryde Local Environmental Plan 2014	RYDE
W4	Working Waterfront	Ryde Local Environmental Plan 2014	RYDE

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REDITUS

Desktop Searches

Topographic Elevation Contours - 2 Metre

2 Llewellyn Street, Rhodes NSW 2138



Legend

- Site Boundary
- 1km Site Boundary Perimeter Buffer
- NSW Elevation Contours (mAHD) - 2m Contour Interval

0 20 40 m

Scale	Date of Export
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Data Sources

Bureau of Meterology, Google Maps, NSW Government

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REDITUS

Desktop Searches

Topographic Elevation Contours - 10 Metre

2 Llewellyn Street, Rhodes NSW 2138



Legend

- Site Boundary
- 1km Site Boundary Perimeter Buffer
- Topograhpic Elevation Contours (mAHD) - 10m Contour Interval

0 100 200 m

Scale	Date of Export
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Data Sources

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Desktop Searches

Naturally Occurring Asbestos Potential

2 Llewellyn Street, Rhodes NSW 2138



Legend

- Site Boundary
- 1km Site Boundary Perimeter Buffer
- Low Potential
- Medium Potential
- High Potential

0 100 200 m

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REDITUS

Desktop Searches

NSW Geological Sheets

2 Llewellyn Street, Rhodes NSW 2138



Legend

- Site Boundary
- 1km Site Boundary Perimeter Buffer
- Geological Unit Boundary

0 100 200 m

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Features within Map Extent

Symbol	Era	Period	Group	SubGroup	Formation	Lithology
Mf	Cainozoic	Quaternary	Unspecified Group	Null	Unspecified Formation	Man-Made Fill. Dredged Estuarine Sand and Mud, Demolition Rubble, Industrial And Household Waste.
Mf/Qha	Cainozoic	Quaternary	Unspecified Group	Null	Unspecified Formation	Man-Made Fill (Dredged Estuarine Sand and Mud, Demolition Rubble, Industrial And Household Waste) Overlying Silty to Peaty Quartz Sand, Silt and Clay With Ferruginous & Humic Cementation in Places and Common Shell Layers
Qha	Cainozoic	Quaternary	Unspecified Group	Null	Unspecified Formation	Silty to Peaty Quartz Sand, Silt, and Clay. Ferruginous and Humic Cementation In Places. Common Shell Layers
Rh	Mesozoic	Triassic	Unspecified Group	Null	Unspecified Formation	Medium to Coarse Grained Quartz Sandstone, Very Minor Shale and Laminate Lenses
Rwa	Mesozoic	Triassic	Wianamatta Group	Null	Ashfield Shale	Black to Dark Grey Shale and Laminate
Water	Unknown	Unknown	Unspecified Group	Null	Unspecified Formation	Unspecified Lithology

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REDITUS

Desktop Searches

NSW Soil Landscapes

2 Llewellyn Street, Rhodes NSW 2138



Legend

- Site Boundary
- 1km Site Boundary Perimeter Buffer
- NSW Soil Landscapes

0 100 200 m

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Desktop Searches

Dryland Salinity

2 Llewellyn Street, Rhodes NSW 2138



Legend

- Site Boundary
- 1km Site Boundary Perimeter Buffer

0 100 200 m

Scale	Date of Export
1:11,000	29/04/2024

Data Sources

Bureau of Meterology, Google Maps, NSW Government

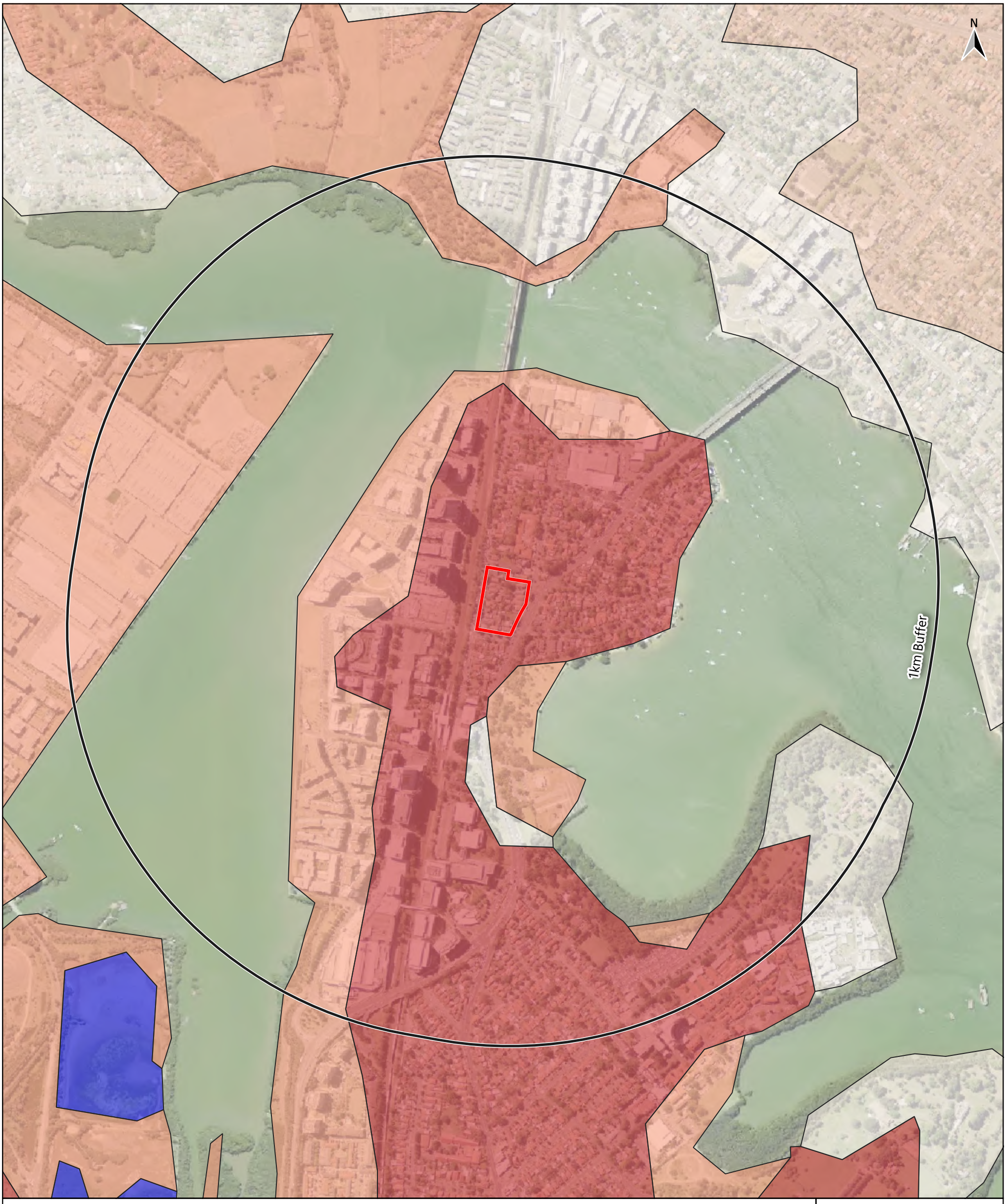
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Desktop Searches

NSW Hydrogeological Landscape (HGL) Salinity

2 Llewellyn Street, Rhodes NSW 2138



Legend

- Site Boundary
- 1km Site Boundary Perimeter Buffer

NSW HGL Salinity Hazard

- Very Low Hazard
- Low Hazard
- Moderate Hazard
- Very High Hazard
- Water Hazard

0 100 200 m

Scale 1:11,000

Date of Export 29/04/2024

Data Sources

Bureau of Meterology, Google Maps, NSW Government

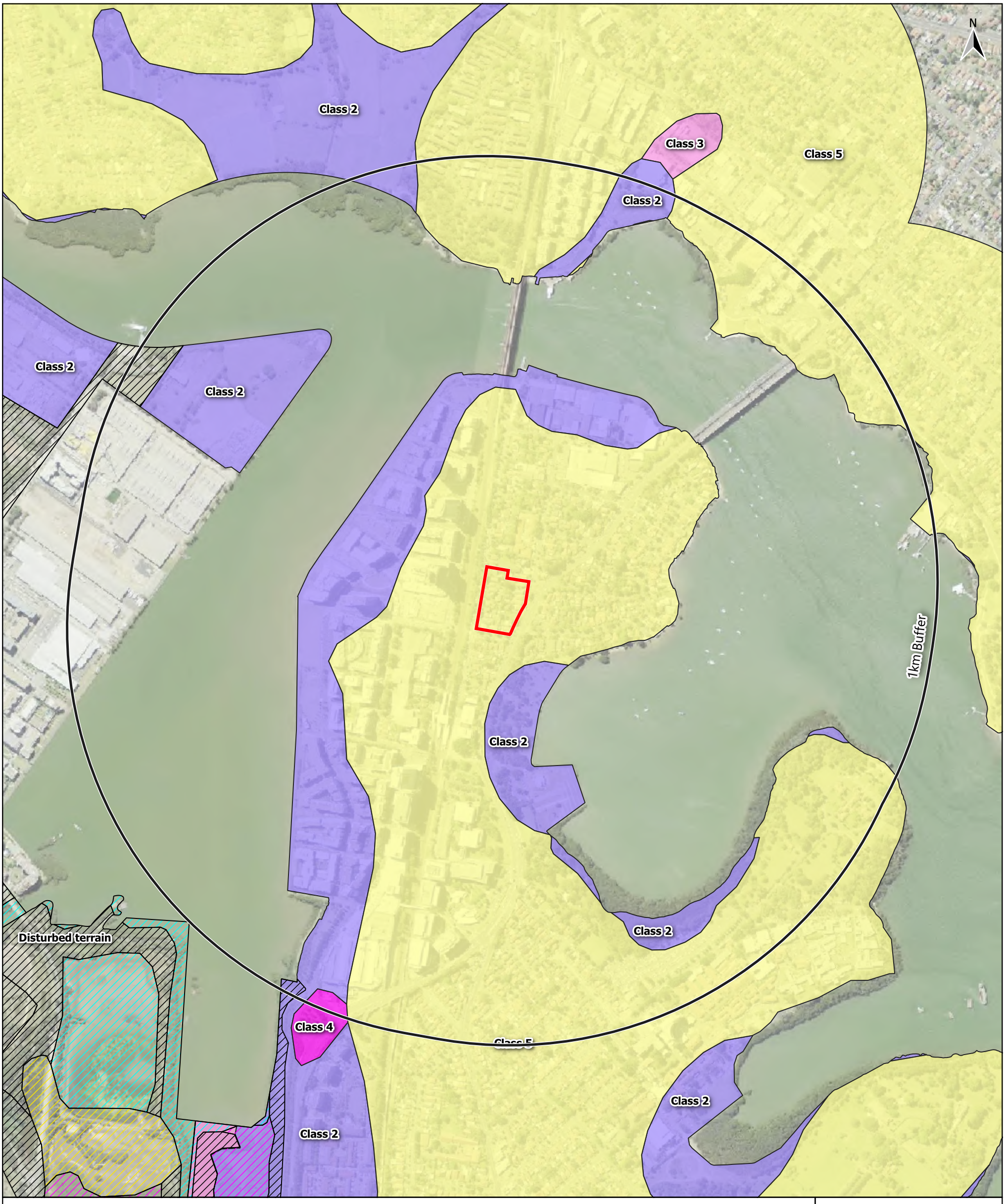
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Desktop Searches

Acid Sulfate Soil Risk Mapping (EPI)

2 Llewellyn Street, Rhodes NSW 2138



Legend

- Site Boundary
- 1km Site Boundary Perimeter Buffer
- Class 2
- Class 3
- Class 4
- Class 5
- Disturbed terrain
- High probability at or near the ground surface
- High probability within 1 m of the ground surface
- High probability of bottom sediments below water level

0 100 200 m

Scale	Date of Export
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Data Sources

Bureau of Meterology, Google Maps, NSW Government

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Features within Map Extent

EPI Name	EPI Type	Acid Sulfate Soils Class
Auburn Local Environmental Plan 2010	LEP	Class 2
Canada Bay Local Environmental Plan 2013	LEP	Class 2
Canada Bay Local Environmental Plan 2013	LEP	Class 3
Canada Bay Local Environmental Plan 2013	LEP	Class 4
Canada Bay Local Environmental Plan 2013	LEP	Class 5
Ryde Local Environmental Plan 2014	LEP	Class 2
Ryde Local Environmental Plan 2014	LEP	Class 3
Ryde Local Environmental Plan 2014	LEP	Class 5
State Environmental Planning Policy (State Significant Precincts) 2005	SEPP	Disturbed terrain
State Environmental Planning Policy (State Significant Precincts) 2005	SEPP	High probability at or near the ground surface
State Environmental Planning Policy (State Significant Precincts) 2005	SEPP	High probability of bottom sediments below water level
State Environmental Planning Policy (State Significant Precincts) 2005	SEPP	High probability within 1 m of the ground surface

Acid Sulfate Soils Class	Description
Class 1	Acid sulfate soils in a class 1 area are likely to be found on and below the natural ground surface.
Class 2	Acid sulfate soils in a class 2 area are likely to be found below the natural ground surface.
Class 3	Acid sulfate soils in a class 3 area are likely to be found beyond 1 metre below the natural ground surface.
Class 4	Acid sulfate soils in a class 4 area are likely to be found beyond 2 metres below the natural ground surface.
Class 5	Acid sulfate soils are not typically found in Class 5 areas. Areas classified as Class 5 are located within 500 metres on adjacent class 1,2,3 or 4 land.

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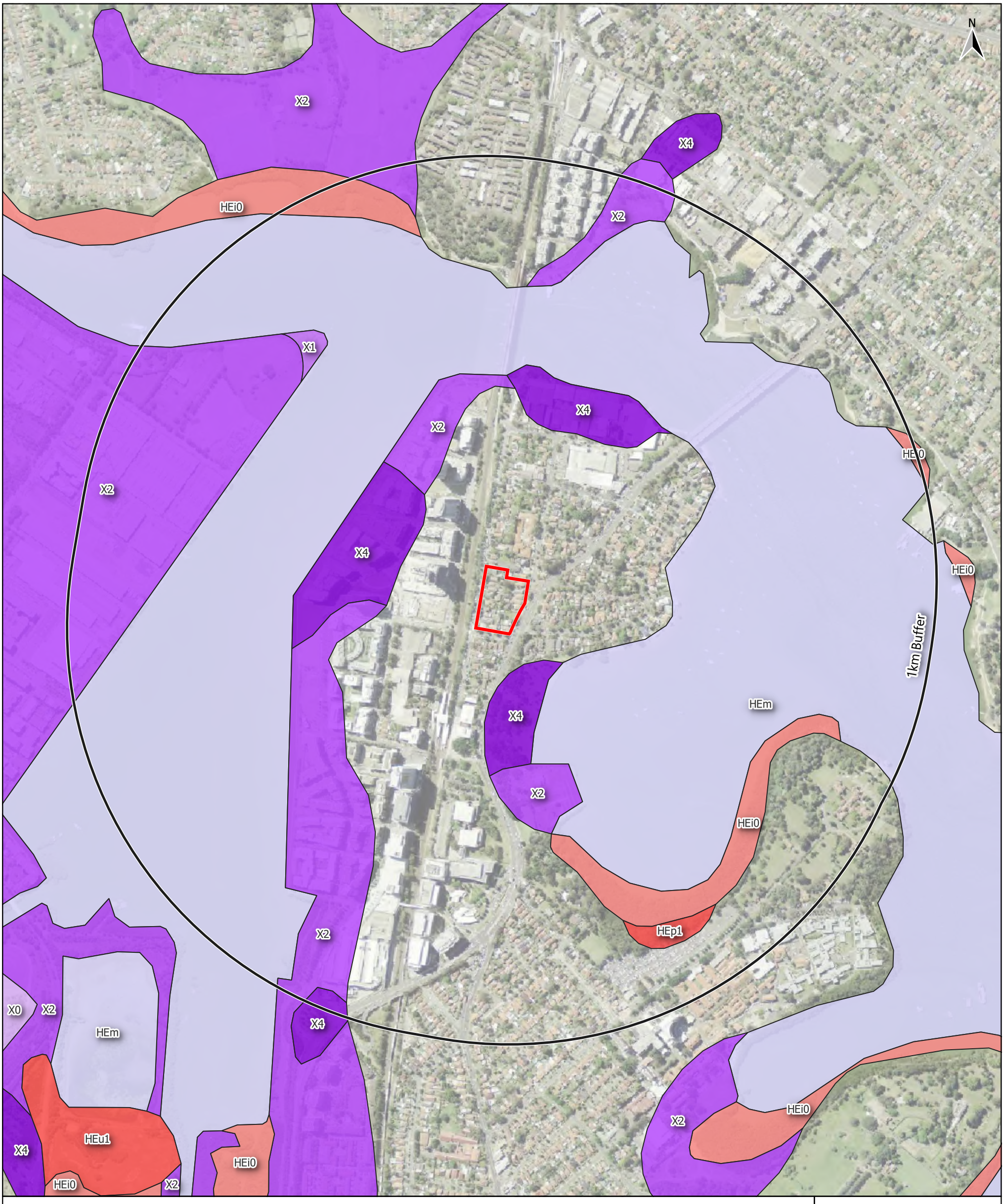
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REDITUS

Desktop Searches

DPIE Acid Sulfate Soil Risk Mapping

2 Llewellyn Street, Rhodes NSW 2138



Legend

- Site Boundary
- 1km Site Boundary Perimeter Buffer
- High probability of occurrence, Bottom Sediments
- High probability of occurrence, 0-1m
- High probability of occurrence, 1-2m
- Disturbed Terrain, 0-1m
- Disturbed Terrain, 1-2m
- Disturbed Terrain, 2-4m
- Disturbed Terrain, >4m

0 100 200 m

Scale	Date of Export
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Data Sources

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Features within Map Extent

Code	Probability	Risk	Landform Process	Landform Element	Elevation	Additional Information
HEi0	High probability of occurrence	High probability of occurrence	Estuarine process	Intertidal Flat	0 - 1 m	na
HEm	High probability of occurrence	High probability of occurrence	Estuarine process	Bottom Sediments	na	na
HEp1	High probability of occurrence	High probability of occurrence	Estuarine process	Plain	1 - 2 m	na
HEu1	High probability of occurrence	High probability of occurrence	Estuarine process	Supratidal Flat	1 - 2 m	na
X0	na	Disturbed Terrain	Disturbed Terrain	na	0 - 1 m	na
X1	na	Disturbed Terrain	Disturbed Terrain	na	1 - 2 m	na
X2	na	Disturbed Terrain	Disturbed Terrain	na	2 - 4 m	na
X4	na	Disturbed Terrain	Disturbed Terrain	na	>4 m	na

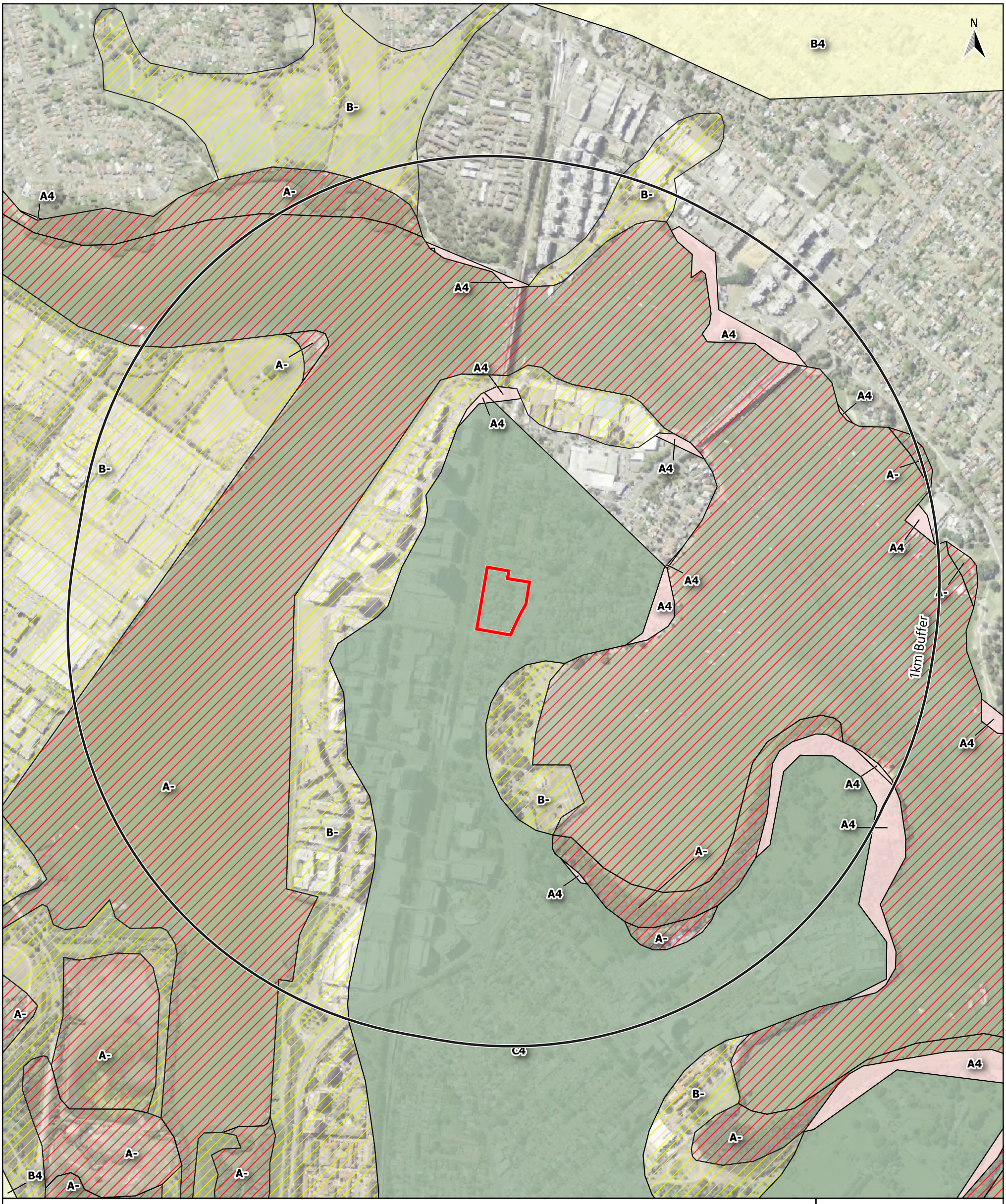
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Desktop Searches

ASRIS Atlas of Australian Acid Sulfate Soils

2 Llewellyn Street, Rhodes NSW 2138



Legend

- Site Boundary
- 1km Site Boundary Perimeter Buffer
- A3 - High Probability/Low Confidence
- A4 - High Probability/Very Low Confidence
- A- - High Probability/Unknown Confidence
- B4 - Low Probability/Very Low Confidence
- B- - High Probability/Unknown Confidence
- C4 - Extemely Low Probability/Very Low Confidence

0 100 200 m

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Features within Map Extent

Code	Probability Class	Confidence	Subscript	Type	Class
Aa(p-)	A	-	p	sulfidic material	ASS in subtidal marine environments
Ab(p-)	A	-	p	sulfidic material	ASS in tidal zones
Ac(p-)	A	-	p	sulfidic material	ASS in tidal zones
Ae(p-)	A	-	p	sulfidic material	ASS in floodplains
Ak(p4)	A	4	p	sulfidic material	ASS in inland lakes, waterways, wetlands and riparian zones
Aq(p4)	A	4	p	sulfidic material	ASS in inland lakes, waterways, wetlands and riparian zones
Ax(p-)	A	-	p	sulfidic material	Disturbed ASS
Bn(p4)	B	4	p	sulfidic material	ASS in inland lakes, waterways, wetlands and riparian zones
Bx(p-)	B	-	p	sulfidic material	Disturbed ASS
Cq(p4)	C	4	p	sulfidic material	ASS in inland lakes, waterways, wetlands and riparian zones

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REDITUS

Desktop Searches

Local Hydrography

2 Llewellyn Street, Rhodes NSW 2138



Legend

- Site Boundary
- 1km Site Boundary Perimeter Buffer
- Surface Water Bodies

Watercourses

- Stream (Perennial)
- Stream (Non-Perennial)
- Wetlands Protection Area

0 100 200 m

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Desktop Searches

NSW Surface Water Catchments

2 Llewellyn Street, Rhodes NSW 2138



Legend

- Site Boundary
- 1km Site Boundary Perimeter Buffer
- Surface Water Catchment

0 100 200 m

Scale
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29/04/2024

Data Sources

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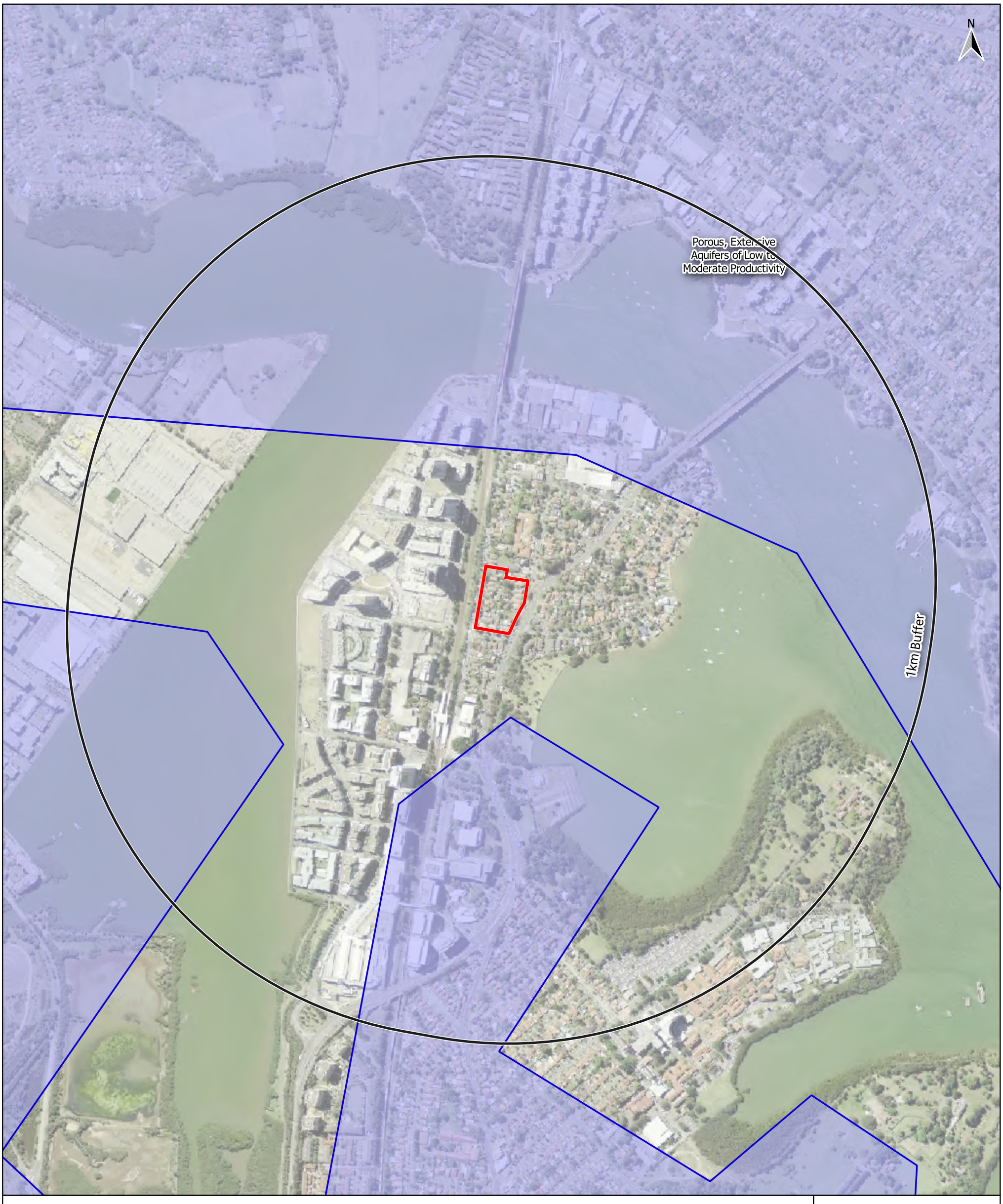
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Desktop Searches

Aquifer Productivity

2 Llewellyn Street, Rhodes NSW 2138



Legend

- Site Boundary
- 1km Site Boundary Perimeter Buffer
- Aquifers

0 100 200 m

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Desktop Searches

Groundwater Vulnerability

2 Llewellyn Street, Rhodes NSW 2138



Legend

- Site Boundary
- 1km Site Boundary Perimeter Buffer

0 100 200 m

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Desktop Searches

EPI Drinking Water Catchments

2 Llewellyn Street, Rhodes NSW 2138



Legend

- Site Boundary
- 1km Site Boundary Perimeter Buffer
- Drinking Water Catchment Area

0 100 200 m

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REDITUS

Desktop Searches

Registered Groundwater Bores

2 Llewellyn Street, Rhodes NSW 2138



Legend

- Site Boundary
- 1km Site Boundary Perimeter Buffer
- Stock/Irrigation Bore (Extraction/Water Supply)
- Monitoring Bore

0 100 200 m

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Features Within Map Extent

Bore and Pipe ID	Bore	Bore Depth	Drilled Date	Type	Status	Latitude	Longitude
GW072314.1.1	GW072314	150	1994-07-26	Irrigation	USE	-33.81653410000	151.0829954
GW067978.1.1	GW067978	180	1992-05-05	Monitoring	USE	-33.83678620000	151.0829032
GW104997.1.1	GW104997	2.4	2001-08-20	Monitoring	USE	-33.81519040000	151.088132
GW104998.1.1	GW104998	3.1	2001-08-20	Monitoring	USE	-33.81510460000	151.0882006
GW104999.1.1	GW104999	3.1	2001-08-20	Monitoring	USE	-33.81515270000	151.088585
GW107955.1.1	GW107955	5	2003-01-01	Monitoring	UNK	-33.82531040000	151.0787533
GW110343.1.1	GW110343	4	1994-04-18	Monitoring	PRP	-33.82608630000	151.0786614
GW110344.1.1	GW110344	3.5	1994-04-18	Monitoring	PRP	-33.82493610000	151.0789583
GW110345.1.1	GW110345	3.5	1994-04-19	Monitoring	PRP	-33.82523050000	151.0775666
GW110346.1.1	GW110346	3.5	1994-04-19	Monitoring	PRP	-33.82570830000	151.0805277
GW110347.1.1	GW110347	3.5	1994-07-11	Monitoring	PRP	-33.82650270000	151.0799916
GW110348.1.1	GW110348	3.5	1994-07-11	Monitoring	PRP	-33.82364990000	151.0779277
GW110349.1.1	GW110349	3.5	1994-07-12	Monitoring	PRP	-33.82469160000	151.0770499
GW112117.1.1	GW112117	2.5	2002-11-13	Monitoring	FUN	-33.82184930000	151.0947226
GW112118.1.1	GW112118	4	2002-11-13	Monitoring	FUN	-33.82192510000	151.0946858
GW112119.1.1	GW112119	4	2002-11-13	Monitoring	FUN	-33.82198460000	151.0948127
GW112120.1.1	GW112120	2.5	2002-11-13	Monitoring	FUN	-33.82205450000	151.0955466
GW116392.1.1	GW116392	5.9	2018-03-21	Monitoring	USE	-33.82350840000	151.0765734
GW116393.2.1	GW116393	5.9	2018-03-21	Monitoring	USE	-33.82343750000	151.0765351
GW116395.3.1	GW116395	5.9	2018-03-21	Monitoring	USE	-33.82349520000	151.0767099
GW116396.4.1	GW116396	5.9	2018-03-21	Monitoring	USE	-33.82334580000	151.0769034
GW204861.1.0	GW204861	4	2017-07-18	Monitoring	USE	-33.82997680000	151.0858676
GW204861.1.1	GW204861	4	2017-07-18	Monitoring	USE	-33.82997680000	151.0858676
GW204861.2.1	GW204861	4.5	2017-07-18	Monitoring	USE	-33.82997680000	151.0858676
GW204861.3.0	GW204861	4.5	2017-07-18	Monitoring	USE	-33.82997680000	151.0858676
GW204861.3.1	GW204861	4.5	2017-07-18	Monitoring	USE	-33.82997680000	151.0858676

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REDITUS

Desktop Searches

Exploration Drillholes

2 Llewellyn Street, Rhodes NSW 2138



Legend

- Site Boundary
- 1km Site Boundary Perimeter Buffer

0 100 200 m

Scale
1:11,000

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Data Sources

Bureau of Meterology, Google Maps, NSW Government

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REDITUS

Desktop Searches

NSW EPA Contaminated Sites List

2 Llewellyn Street, Rhodes NSW 2138



Legend

- Site Boundary
- 1km Site Boundary Perimeter Buffer

Contamination Type

- Chemical Industry
- Other Petroleum
- Unclassified
- Other Industry

0 100 200 m

Scale	Date of Export
1:11,000	29/04/2024

Data Sources

Bureau of Meterology, Google Maps, NSW Government

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Features Within Map Extent

Site	Address	Suburb	Contamination Type	Management Class
Former Allied Feeds site	Walker STREET	RHODES	Other Industry	Contamination formerly regulated under the CLM Act
Former Council Works Depot	2 Parsonage STREET	MEADOWBANK	Unclassified	Regulation under CLM Act not required
Former Glad factory site	10-16 Marquet STREET	RHODES	Chemical Industry	Regulation under CLM Act not required
Former UCAL site	Walker STREET	RHODES	Chemical Industry	Ongoing maintenance required to manage residual contamination (CLM Act)
Homebush Bay sediments adjoining former Berger Paint factory	Oulton AVENUE	RHODES	Chemical Industry	Ongoing maintenance required to manage residual contamination (CLM Act)
Homebush Bay Sediments adjoining the former UCAL and Allied Feeds sites	Homebush BAY	RHODES	Chemical Industry	Ongoing maintenance required to manage residual contamination (CLM Act)
Putney Marina	20 Waterview STREET	PUTNEY	Other Industry	Regulation under CLM Act not required
RMS Eastern Precinct	3-7 Burroway ROAD	WENTWORTH POINT	Other Petroleum	Regulation under CLM Act not required
RMS Western Precinct	14A-14E and 16 Hill ROAD	SYDNEY OLYMPIC PARK	Other Petroleum	Regulation under CLM Act not required

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REDITUS

Desktop Searches

National Liquid Fuel Facilities

2 Llewellyn Street, Rhodes NSW 2138



Legend

- Site Boundary
- 1km Site Boundary Perimeter Buffer

0 100 200 m

Scale
1:11,000

Date of Export
29/04/2024

Data Sources

Bureau of Meterology, Google Maps, NSW Government

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REDITUS

Desktop Searches

National Polutant Inventory (NPI) Facilities

2 Llewellyn Street, Rhodes NSW 2138



Legend

- Site Boundary
- 1km Site Boundary Perimeter Buffer

0 100 200 m

Scale
1:11,000

Date of Export
29/04/2024

Data Sources

Bureau of Meterology, Google Maps, NSW Government

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2 Llewellyn Street, Rhodes NSW 2138

Features Within Map Extent

Facility	Facility Type	Activities	Company	Street Address	Suburb
No Records Within Map Extent					

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REDITUS

Desktop Searches

Potential PFAS Sites
Airports, Defence, Fire Stations -

2 Llewellyn Street, Rhodes NSW 2138



Legend

- Site Boundary
- 1km Site Boundary Perimeter Buffer
- Fire Stations

0 100 200 m

Scale	Date of Export
1:11,000	29/04/2024

Data Sources

Bureau of Meterology, Google Maps, NSW Government

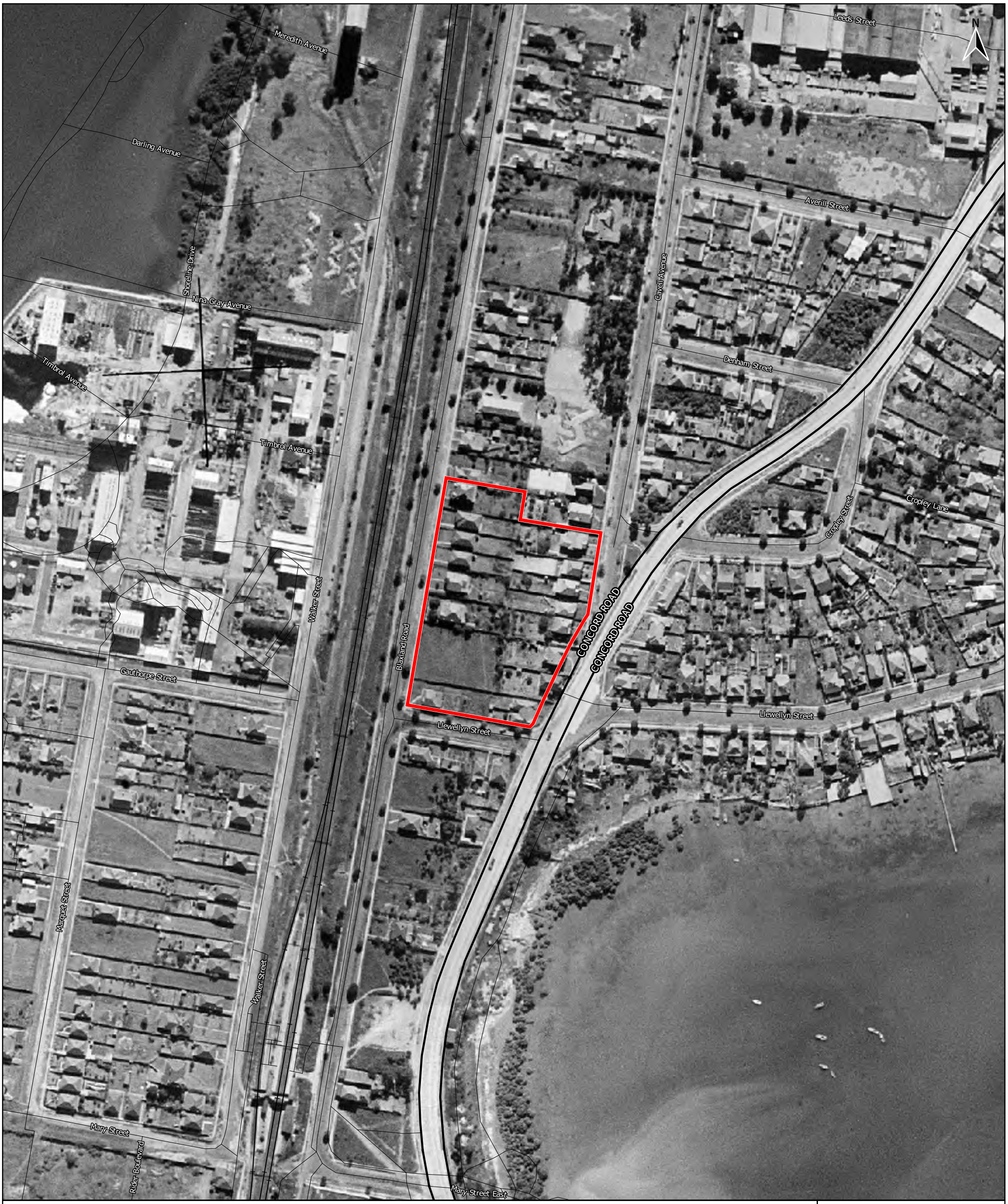
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REDITUS

Desktop Searches

Historical Imagery - 1943 Basemap

2 Llewellyn Street, Rhodes NSW 2138



Legend

- Site Boundary

Present-day Features

- Motorway
- Road
- Railways

0 30 60 m

Scale	Date of Export
1:3,000	29/04/2024

Data Sources

Bureau of Meterology, Google Maps, NSW Government

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REDITUS

Desktop Searches

Historical Imagery - 1955 Basemap

2 Llewellyn Street, Rhodes NSW 2138



Legend

Site Boundary

Present-day Features

- Motorway
- Road
- Railways

0 30 60 m

Scale	Date of Export
1:3,000	29/04/2024

Data Sources

Bureau of Meterology, Google Maps, NSW Government

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REDITUS

Desktop Searches

Historical Imagery - 1965 Basemap

2 Llewellyn Street, Rhodes NSW 2138



Legend

Site Boundary

Present-day Features

- Motorway
- Road
- Railways

0 30 60 m

Scale	Date of Export
1:3,000	29/04/2024

Data Sources

Bureau of Meterology, Google Maps, NSW Government

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REDITUS

Desktop Searches

Historical Imagery - 1970 Basemap

2 Llewellyn Street, Rhodes NSW 2138



Legend

- Site Boundary

Present-day Features

- Motorway
- Road
- Railways

0 30 60 m

Scale	Date of Export
1:3,000	29/04/2024

Data Sources

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REDITUS

Desktop Searches

Historical Imagery - 1971 Basemap

2 Llewellyn Street, Rhodes NSW 2138



Legend

Site Boundary

Present-day Features

- Motorway
- Road
- Railways

0 30 60 m

Scale

1:3,000

Date of Export

29/04/2024

Data Sources

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REDITUS

Desktop Searches

Historical Imagery - 1986 Basemap

2 Llewellyn Street, Rhodes NSW 2138



Legend

Site Boundary

Present-day Features

Motorway

Road

Railways

0 30 60 m

Scale	Date of Export
1:3,000	29/04/2024

Data Sources

Bureau of Meterology, Google Maps, NSW Government

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REDITUS

Desktop Searches

Historical Imagery - 1991 Basemap

2 Llewellyn Street, Rhodes NSW 2138



Legend

Site Boundary

Present-day Features

Motorway

Road

Railways

0 30 60 m

Scale	Date of Export
1:3,000	29/04/2024

Data Sources

Bureau of Meterology, Google Maps, NSW Government

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REDITUS

Desktop Searches

Historical Imagery - 1994 Basemap

2 Llewellyn Street, Rhodes NSW 2138



Legend

Site Boundary

Present-day Features

- Motorway
- Road
- Railways

0 30 60 m

Scale	Date of Export
1:3,000	29/04/2024

Data Sources

Bureau of Meterology, Google Maps, NSW Government

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REDITUS

Desktop Searches

Historical Imagery - 1996 Basemap

2 Llewellyn Street, Rhodes NSW 2138



Legend

Site Boundary

Present-day Features

Motorway

Road

Railways

0 30 60 m

Scale	Date of Export
1:3,000	29/04/2024

Data Sources

Bureau of Meterology, Google Maps, NSW Government

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REDITUS

Desktop Searches

Historical Imagery - 2004 Basemap

2 Llewellyn Street, Rhodes NSW 2138



Legend

Site Boundary

Present-day Features

- Motorway
- Road
- Railways

0 30 60 m

Scale	Date of Export
1:3,000	29/04/2024

Data Sources

Bureau of Meterology, Google Maps, NSW Government

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REDITUS

Desktop Searches

Historical Imagery - 2005 Basemap

2 Llewellyn Street, Rhodes NSW 2138



Legend

Site Boundary

Present-day Features

Motorway

Road

Railways

0 30 60 m

Scale	Date of Export
1:3,000	29/04/2024

Data Sources

Bureau of Meterology, Google Maps, NSW Government

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REDITUS

Desktop Searches

Recent Imagery

2 Llewellyn Street, Rhodes NSW 2138



Legend

Site Boundary

Present-day Features

- Motorway
- Road
- Railways

0 30 60 m

Scale	Date of Export
1:3,000	29/04/2024

Data Sources

Bureau of Meterology, Google Maps, NSW Government

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D

Borelogs



BOREHOLE LOG

CLIENT: Billbergia Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: 2 Llewellyn Street, Rhodes, NSW

SURFACE LEVEL: 18.4 AHD
COORDINATE: E:323097.0, N:6255341.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH1
PROJECT No: 229157.01
DATE: 07/08/24 - 08/08/24
SHEET: 1 of 4

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TESTING AND REMARKS: TEST TYPE	TESTING AND REMARKS: RESULTS AND REMARKS	BACKFILL	WELL PIPE
	18	0.30	FILL / Clayey SILT, trace rootlets: dark brown; low to medium plasticity.		possibly FILL / TOP	NA	w>PL		D	0.10 - 0.20	0.10 0.20			0.0 Flush cover 0.2 Gravel	
			CLAY (CI-CH), trace gravel: dark brown mottled orange-brown; medium to high plasticity; fine to medium, angular to sub-rounded, ironstone gravel.		RS	(St) to (VSt)	w=PL		D	0.40 - 0.50	0.40 0.50				
		0.70													
		1	CLAY (CI-CH), trace gravel: pale brown; medium to high plasticity; fine, sub-angular to sub-rounded, ironstone gravel.		RS	H	w<PL		D	0.90 - 1.00	0.90 1.00				
	17	1.40			XWM				SPT			SPT	16,22,25/140 N=47		
		1.50	Silty CLAY (CI), with gravel: grey and brown; medium plasticity; medium to coarse, ironstone gravel.								1.44				
		2	Continued as rock								2				
	16	3									3				
	15	4									4			Bentonite	
	14	5									5				
	13	6									6				
15/08/24 20/08/24	12	7									7				
	11	8									8				
	10	9									9				
	9														

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

PLANT: Comacchio Geo 205
METHOD: AD/T to 1.50m, NMLC to 25.11m
REMARKS: Groundwater well installed with gatic cover at surface

OPERATOR: Ground Test (JJ)

LOGGED: LL
CASING: HW to 1.5m

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Split Soil-Rock Log

BOREHOLE LOG

CLIENT: Billbergia Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: 2 Llewellyn Street, Rhodes, NSW

SURFACE LEVEL: 18.4 AHD
COORDINATE: E:323097.0, N:6255341.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH1
PROJECT No: 229157.01
DATE: 07/08/24 - 08/08/24
SHEET: 2 of 4

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD	FRACTURE SPACING (m)	DEFECTS & REMARKS	SAMPLE REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	BACKFILL	WELL PIPE
	18	0	Continued from soil			1.50									0			Flush cover / Gravel	
	17	1	Silty CLAY (CI), trace ironstone and bands of very low strength siltstone: grey and brown; medium plasticity; extremely weathered siltstone.		XW		SOIL	100	0	SOIL					1				
	16	2													2				
	15	2.90	CORE LOSS: 630mm			2.90									3				
	14	3.53	Silty CLAY (CI), trace ironstone and bands of very low strength siltstone: grey and brown; medium plasticity; extremely weathered siltstone.		XW	3.53	SOIL	78	0	SOIL					4			Bentonite	
	13	5				4.64 4.71	VL SOIL			SOIL					5				
	12	5.45	SILTSTONE: dark grey, distinct, laminated, 0 to 10°, thinly laminated; 5-10% pale grey sandstone laminations, highly fractured . Ashfield Shale		HW SW to MW	5.45 5.67	VL L	100	22		5.76-5.90m: JT x2, 40-80° , PR, SN Fe, SM 5.95-6.17m: B x4, 0-10°, IR, SN Fe, RF 6.18m: JT, 30°, PR, TI Fe 6.19-6.26m: B x2, 0°, PR, SN Fe 6.45-6.90m: B x12, 0°, PR, SN Fe, SM 6.94m: JT, 40-70°, IR, TI Fe 7.15m: EW, 0-10°, Clay 15 mm 7.19m: B, 5°, PR, TI Fe 7.25m: JT, 10°, PR, SN Fe, SM 7.29m: EW, 10°, 15mm 7.33-7.45m: JT x7, 5-20°, PR, HE Fe 7.51-7.61m: JT x3, 10°, PR, SN Fe, SM 7.72-7.84m: SZ, SN Fe 120mm, displacement 5mm 7.87-8.04m: B x4, 0°, PR, SN Fe, RF 8.11m: JT, 0-40°, ST, INF Fe 4mm 8.19-8.84m: B x13, 0-10°, PR, SN Fe, RF 8.87m: EW, 0°, Clay 10mm 8.90-8.96m: B x4, 0-5°, PR, SN Fe, SM 9.28-9.33m: B x2, 0°, PR, VNR Clay, SM				6	PLT	PL(A)=0.22MPa		
20/08/24 15/08/24	11	7													7	PLT	PL(A)=0.27MPa		
	10	7.82	SILTSTONE: dark grey, 20% pale grey, fine grained sandstone laminations; Ashfield Shale		SW	7.85	M	100	72						8	PLT	PL(A)=0.71MPa		
	9	8													9	PLT	PL(A)=0.49MPa		
																PLT	PL(A)=0.66MPa		

NOTES: [#]Soil origin is "probable" unless otherwise stated.

Generated with CORE-GS by Geroc - Split Soil-Rock Log

PLANT: Comacchio Geo 205
METHOD: AD/T to 1.50m, NMLC to 25.11m
REMARKS: Groundwater well installed with gatic cover at surface

OPERATOR: Ground Test (JJ)

LOGGED: LL
CASING: HW to 1.5m

Douglas PARTNERS

BOREHOLE LOG

CLIENT: Billbergia Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: 2 Llewellyn Street, Rhodes, NSW

SURFACE LEVEL: 18.4 AHD
COORDINATE: E:323097.0, N:6255341.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH1
PROJECT No: 229157.01
DATE: 07/08/24 - 08/08/24
SHEET: 3 of 4

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD	FRACTURE SPACING (m)	DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	BACKFILL	WELL PIPE
	8	11	[CONT] SILTSTONE: dark grey, 20% pale grey, fine grained sandstone laminations; Ashfield Shale		SW	11.00	M	100	72		10. 16m: B, 0°, PR, SN Fe, SM 10. 23m: JT, 90°, IR, TI Fe, discontinuous 10. 36m: B, 0°, PR, VNR Clay, SM 10. 61m: B, 0°, PR, SN Fe, SM 10. 81-11.22m: B x5, 0°, PR, CT Clay 3mm, SM 11. 48-11.59m: JT, 90°, IR, TI, discotinuous 11. 62-11.82m: JT, 30-80°, PR, TI, discontinuous 11. 98-12.30m: F, 80°, PR, HE, displaced 4mm				11	PLT	PL(A)=1.2MPa PL(A)=0.94MPa		
	7	12													12	PLT	PL(A)=0.67MPa		
	6	13				13.10					13. 08m: JT, 45-50°, IR, TI				13	PLT	PL(A)=0.56MPa PL(A)=1.1MPa		
	5	14						100	92		13. 44-13.91m: F, 80°, PR, HE, displaced 2mm 13. 72m: JT, 60°, IR, VNR Py, RF 14. 00m: JT, 60°, IR, CN, SM 14. 13m: JT, 45°, UN, CT Clay 2mm 14. 24-14.45m: F, 70°, PR, HE, displaced 1mm 14. 43-14.52m: JT x2, 20°, IR, CN, SM 14. 62-14.70m: JT x2, 45°, IR, CN, SM 14. 88-15.10m: JT x4, 45°, IR, CN, SM 15. 16-15.18m: JT x2, 45°, CU, VNR Qz, SM 15. 36m: JT, 90°, IR, CN, SM 15. 49m: B, 0°, PR, VNR Py, RF 15. 53m: JT, 90°, IR, HE 15. 60m: JT, 40°, PR, CN, SM 15. 64m: JT, 30°, PR, CN, SM 15. 68-15.71m: B x2, 0°, PR, VNR Py, RF 15. 85m: JT, 80-90°, IR, CN, RF 16. 81m: JT, 45°, PR, VNR Py, RF 16. 94m: JT, 90°, IR, CN, RF				14	PLT	PL(A)=1.3MPa		
	4	15													15	PLT	PL(A)=1.3MPa		
	3	15.50	SILTSTONE: dark grey, indistinct, laminated, 0°, thinly laminated, 5% pale grey sandstone laminations; slightly fractured and fractured. Ashfield Shale		FR		H	100	91										
	2	16													16	PLT	PL(A)=1.1MPa		
	1	17													17	PLT	PL(A)=0.89MPa		
	0	18									18. 12m: B, 0°, PR, CN, SM				18	PLT	PL(A)=1.2MPa		
											18. 56m: JT, 20°, PR, CN, SM								
	-1	19				19.60	M to H	100	97		19. 27m: JT, 70°, PR, CN, SM 19. 76m: JT, 40°, PR, CN, SM 19. 88-19.95m: JT x3, 40-				19	PLT	PL(A)=1.3MPa		

Generated with CORE-GS by Geroc - Split Soil-Rock Log

NOTES: [R]Soil origin is "probable" unless otherwise stated.

PLANT: Comacchio Geo 205
METHOD: AD/T to 1.50m, NMLC to 25.11m
REMARKS: Groundwater well installed with gatic cover at surface

OPERATOR: Ground Test (JJ)

LOGGED: LL
CASING: HW to 1.5m

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

BOREHOLE LOG

CLIENT: Billbergia Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: 2 Llewellyn Street, Rhodes, NSW

SURFACE LEVEL: 18.4 AHD
COORDINATE: E:323097.0, N:6255341.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH1
PROJECT No: 229157.01
DATE: 07/08/24 - 08/08/24
SHEET: 4 of 4

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	WEATH. (RS, XW, HW, DW, MW, SW, FR)	DEPTH (m)	STRENGTH (VL, L, M, H, VH, EH)	RECOVERY (%)	RQD	FRACTURE SPACING (m)	DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	BACKFILL	WELL PIPE
	-2	21	[CONT] SILTSTONE: dark grey, indistinct, laminated, 0°, thinly laminated, 5% pale grey sandstone laminations; slightly fractured and fractured. Ashfield Shale				M to H	100	97		80°, PR, CN, SM 20. 61-20.85m: JT x3, 70-80°, IR, CN, SM				21	PLT	PL(A)=0.45MPa		
	-3	22	21.55m-22.00m: fine grained sandstone bed 22.42m: disturbed bedding 70-80°			21.31	H				21. 21m: JT, 20°, PR, CN, SM, discontinusous 21. 22m: B, 5°, IR, VNR Py, SM 21. 31m: JT, 90°, IR, TI, discontinusous				22	PLT	PL(A)=0.59MPa		
	-4	22.28														PLT	PL(A)=1.5MPa		
	-4	23	INTERBEDDED SILTSTONE (60%) AND SANDSTONE (40%): SILTSTONE: dark grey, distinct; irregular bedding 0-20° SANDSTONE: pale grey, fine to medium grained. Ashfield Shale		FR	22.28		100	94						23	PLT	PL(A)=3.4MPa		
	-5	24					H to VH									PLT	PL(A)=2.9MPa		
	-6	25						100	100		24. 24m: B, 0°, PR, VNR Clay, SM				25	PLT	PL(A)=3.7MPa		
	-7	26	Borehole discontinued at 25.11m depth. Target depth reached.																
	-8	27																	
	-9	28																	
	-10	29																	
	-11																		

NOTES: (R)Soil origin is "probable" unless otherwise stated.

PLANT: Comacchio Geo 205
METHOD: AD/T to 1.50m, NMLC to 25.11m
REMARKS: Groundwater well installed with gatic cover at surface

OPERATOR: Ground Test (JJ)

LOGGED: LL
CASING: HW to 1.5m

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Split Soil-Rock Log

BOREHOLE LOG

CLIENT: Billbergia Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: 2 Llewellyn Street, Rhodes, NSW

SURFACE LEVEL: 16.8 AHD
COORDINATE: E:323081.0, N:6255307.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH2
PROJECT No: 229157.01
DATE: 09/08/24 - 12/08/24
SHEET: 1 of 4

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TESTING AND REMARKS: TEST TYPE	TESTING AND REMARKS: RESULTS AND REMARKS	BACKFILL	WELL PIPE
15/08/24	16	0.40	FILL / Silty Gravelly CLAY, trace rootlets: dark brown; low plasticity; fine to coarse, igneous gravel.		FILL / FILL	NA	M to D		D		0.10 0.20			Flush cover Concrete Gravel	
			CLAY (CI-CH), trace rootlets, trace gravel: orange-brown; medium to high plasticity; fine, sub-angular to sub-rounded, ironstone gravel. From 0.70m: pale grey mottled orange-brown		RS	St to VSt	w=PL		D D SPT		0.50 0.60 0.90 1.00	SPT	3,5,8 N=13		
	15	1.60	CLAY (CI-CH), with gravel: pale orange-brown; medium to high plasticity; fine, sub-angular to sub-rounded, ironstone gravel; gradual change from 1.6-1.8m.		RS		w<PL		D D		1.45 1.60 1.90 2.00				
	14	2.40	SILTSTONE: brown and grey; apparently very low strength. Ashfield Shale			NA	NA		D SPT SPT		2.40 2.50	SPT	8,21,18/100 (HB)		
		2.90	Continued as rock								2.95				
20/08/24														Bentonite	

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

PLANT: Comacchio Geo 205
METHOD: AD/T to 2.9m, NMLC to 20.80m
REMARKS: Groundwater well installed with gatic cover at surface

OPERATOR: Ground Test (JJ)

LOGGED: JL
CASING: HW to 2.7m

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

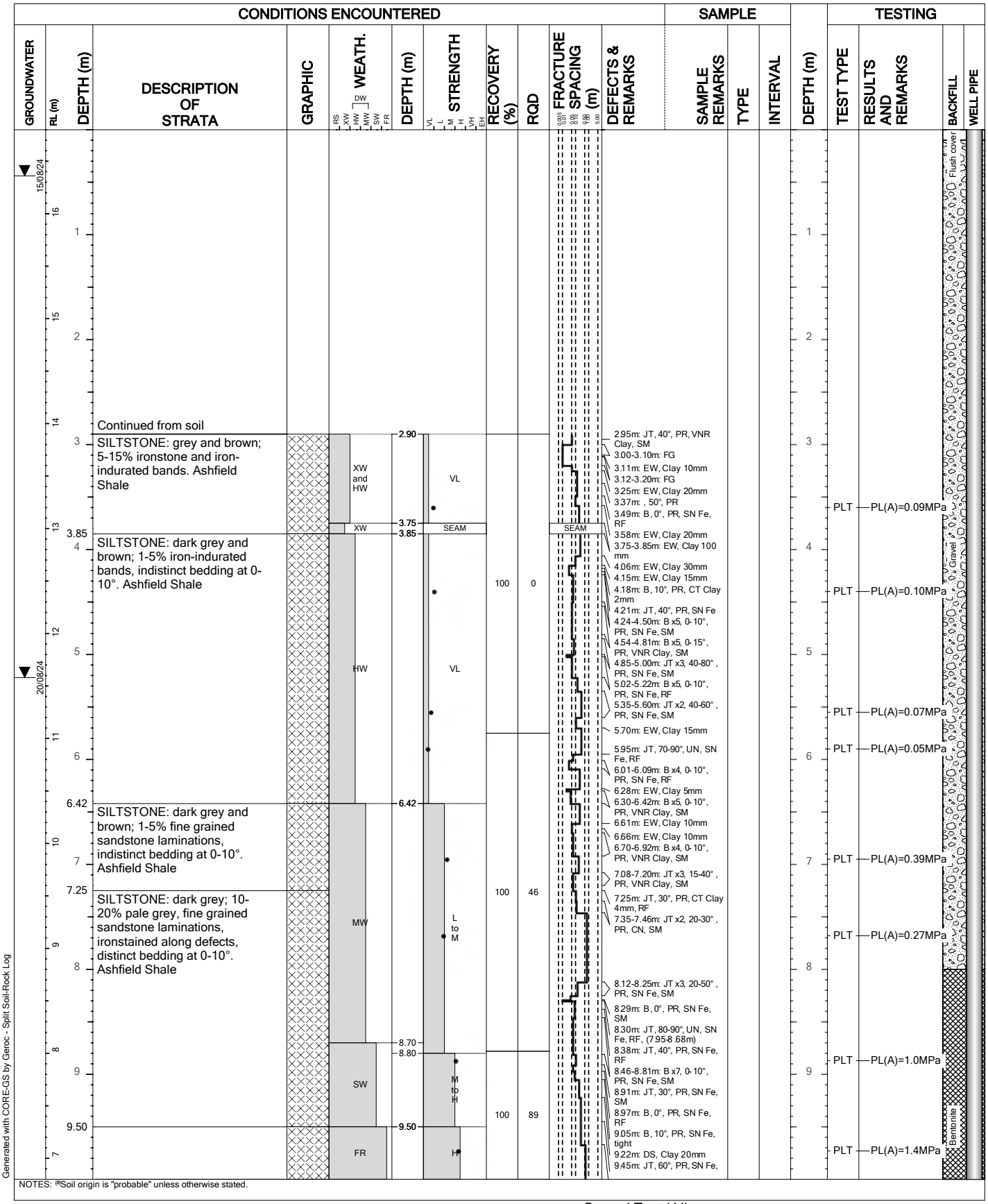
Generated with CORE-GS by Geroc - Split Soil-Rock Log

BOREHOLE LOG

CLIENT: Billbergia Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: 2 Llewellyn Street, Rhodes, NSW

SURFACE LEVEL: 16.8 AHD
COORDINATE: E:323081.0, N:6255307.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH2
PROJECT No: 229157.01
DATE: 09/08/24 - 12/08/24
SHEET: 2 of 4



NOTES: (#)Soil origin is "probable" unless otherwise stated.

Generated with CORE-GS by Geroc - Split Soil-Rock Log

PLANT: Comacchio Geo 205
METHOD: AD/T to 2.9m, NMLC to 20.80m
REMARKS: Groundwater well installed with gatic cover at surface

OPERATOR: Ground Test (JJ)

LOGGED: JL
CASING: HW to 2.7m

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

BOREHOLE LOG

CLIENT: Billbergia Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: 2 Llewellyn Street, Rhodes, NSW

SURFACE LEVEL: 16.8 AHD
COORDINATE: E:323081.0, N:6255307.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH2
PROJECT No: 229157.01
DATE: 09/08/24 - 12/08/24
SHEET: 3 of 4

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD	FRACTURE SPACING (m)	DEFECTS & REMARKS	SAMPLE REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	BACKFILL	WELL PIPE
	6	11	SILTSTONE: dark grey; 15-30% pale grey, fine grained sandstone laminations, distinct and indistinct bedding at 0-10°. Ashfield Shale		RS, XW, HW, DW, MW, SW, FR		VL, L, M, H, VH, EH	100	89	0.05, 0.06, 0.08, 0.10, 0.20, 1.00	RF 9.67m: B, 10°, PR, VNR Clay, SM 10.20m: JT, 20°, PR, CN, SM 10.36m: B, 0°, PR, SN Fe, SM				11	PLT	PL(A)=1.9MPa	Gravel	
	5	12													12	PLT	PL(A)=2.2MPa		
	4	13						100	100		12.33m: B, 5°, PR, VNR Clay, SM				13	PLT	PL(A)=2.2MPa		
	3	14					H								14	PLT	PL(A)=3.0MPa		
	2	14.70	SILTSTONE: dark grey; 1% pale grey, fine grained sandstone laminations, distinct and indistinct bedding at 0-10°. Ashfield Shale		FR														
	1	15													15	PLT	PL(A)=2.7MPa		
	0	16						100	100						16	PLT	PL(A)=1.6MPa		
	-1	17									16.98m: JT, 30°, PR, CN, SM				17	PLT	PL(A)=1.9MPa		
		17.58	SILTSTONE: dark grey; indistinct bedding at 0-10°								17.68m: JT, 30°, PR, CN, SM								
	-2	18				18.00									18	PLT	PL(A)=1.4MPa		
	-3	19					M, H	100	100		18.44m: B, 10°, PR, VNR Clay, SM 19.34m: JT, 40°, PR, CN, SM				19	PLT	PL(A)=1.1MPa		
																PLT	PL(A)=1.1MPa		

NOTES: (#)Soil origin is "probable" unless otherwise stated.

Generated with CORE-GS by Geroc - Split Soil-Rock Log

PLANT: Comacchio Geo 205
METHOD: AD/T to 2.9m, NMLC to 20.80m
REMARKS: Groundwater well installed with gatic cover at surface

OPERATOR: Ground Test (JJ)

LOGGED: JL
CASING: HW to 2.7m

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

BOREHOLE LOG

CLIENT: Billbergia Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: 2 Llewellyn Street, Rhodes, NSW

SURFACE LEVEL: 16.8 AHD
COORDINATE: E:323081.0, N:6255307.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH2
PROJECT No: 229157.01
DATE: 09/08/24 - 12/08/24
SHEET: 4 of 4

CONDITIONS ENCOUNTERED													SAMPLE				TESTING			
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	WEATH. (RS, XW, DW, HW, MW, SW, FR)	DEPTH (m)	STRENGTH (VL, L, M, H, VH, EH)	RECOVERY (%)	RQD	FRACTURE SPACING (m) (0.005, 0.05, 0.06, 0.20, 0.60, 2.00)	DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	BACKFILL	WELL PIPE
	-4	21	[CONT] SILTSTONE: dark grey; indistinct bedding at 0-10°		FR		M to H	100	100							PLT	PL(A)=0.75MPa		
			Borehole discontinued at 20.80m depth. Target depth reached.																
	-5	22																	
	-6	23																	
	-7	24																	
	-8	25																	
	-9	26																	
	-10	27																	
	-11	28																	
	-12	29																	
	-13																		

NOTES: (R)Soil origin is "probable" unless otherwise stated.

PLANT: Comacchio Geo 205
METHOD: AD/T to 2.9m, NMLC to 20.80m
REMARKS: Groundwater well installed with gatic cover at surface

OPERATOR: Ground Test (JJ)

LOGGED: JL
CASING: HW to 2.7m

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Split Soil-Rock Log

BOREHOLE LOG

CLIENT: Billbergia Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: 2 Llewellyn Street, Rhodes, NSW

SURFACE LEVEL: 12.3 AHD
COORDINATE: E:323068.1, N:6255231.8
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH3
PROJECT No: 229157.01
DATE: 12/08/24 - 13/08/24
SHEET: 1 of 3

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(^)	DENSITY.(^)	MOISTURE	REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TESTING AND REMARKS: TEST TYPE	TESTING AND REMARKS: RESULTS AND REMARKS	BACKFILL	WELL PIPE
	12	0.60	FILL / Silty CLAY, with gravel: dark brown; medium plasticity; fine to medium, siltstone gravel; trace rootlets.		FILL			M		D	0.10–0.20	0.10			Flush cover	
										D	0.50–0.60	0.20			0 Gravel	
	11	1.70	CLAY (CI-CH), trace gravel: orange-brown; medium to high plasticity; fine, ironstone gravel. From 0.80m: Red-brown mottled pale grey		RS	St		w=PL		D	0.90–1.00	0.50				
										SPT	1.45	0.60	SPT	3,5,7 N=12		
	10	3.00	CLAY (CI-CH), with gravel: pale grey mottled red-brown; medium to high plasticity; fine to coarse, ironstone gravel.		RS	H		w<PL		D	1.60	0.90				
										D	1.90–2.00	1.00				
										SPT	2.50	1.45				
											2.95	1.60	SPT	13,22,24 N=46		
												1.90				
												2.00				
												2.50				
												2.95				
			Continued as rock												Bentonite	
15/08/24																

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

PLANT: Commachio 205
METHOD: AD/T to 3.0m, NMLC to 16.52m
REMARKS: Groundwater well installed with gatic cover at surface

OPERATOR: Ground Test (JJ)

LOGGED: JL
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Split Soil-Rock Log

BOREHOLE LOG

CLIENT: Billbergia Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: 2 Llewellyn Street, Rhodes, NSW

SURFACE LEVEL: 12.3 AHD
COORDINATE: E:323068.1, N:6255231.8
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH3
PROJECT No: 229157.01
DATE: 12/08/24 - 13/08/24
SHEET: 2 of 3

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD	FRACTURE SPACING (m)	DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	BACKFILL	WELL PIPE
	12	0													0			Flush cover	
	11	1													1			Gravel	
	10	2													2				
	9	3	Continued from soil CORE LOSS: 500mm		DW	3.00									3				
		3.50	Silty CLAY (CI): grey-brown and red-brown; medium plasticity; bands of very low strength siltstone; extremely weathered siltstone.		XW	3.50	SOIL	58	0	SOIL					4			Bentonite	
	8	4.20	SILTSTONE: brown and grey, 5% iron-indurated bands. Ashfield Shale		HW	4.20	VL to L								5	PLT	PL(A)=0.16MPa		
15/08/24					XW	4.75	SEAM			SEAM									
	7				HW	4.91	VL	100	0		4.21-4.31m: B x3, 0-5°, PR, SN Fe, SM 4.38m: EW, Clay 20mm 4.45m: B, 0°, PR, SN Fe, SM 4.46m: JT, 40°, PR, CT Clay 1mm 4.59m: JT, 60°, PR, SN Fe, SM 4.62-4.71m: JT x3, 30-50°, PR, CT Clay 1mm 4.75-4.91m: DS, Clay 160mm, (JT 80°) 5.06m: JT, 60°, PR, TI 5.26m: EW, Clay 10mm 5.31m: EW, Clay 10mm 5.35-5.50m: JT x3, 20-30°, PR, CT Clay 1mm 5.55-5.60m: B x2, 0°, PR, CT Clay 1mm, SM 5.75-6.10m: JT x4, 20°, PR, SN Fe, RF				6	PLT	PL(A)=0.07MPa		
	6				MW	5.75	L												
		6.75	SILTSTONE: dark grey, 1-5% pale grey, fine grained sandstone laminations. Ashfield Shale			6.75	M	100	96		6.50m: B, 10°, UN, SN Fe, RF 6.75m: B, 0°, PR, VNR Clay, SM 7.53m: B, 0°, PR, VNR Clay, SM				7	PLT	PL(A)=0.29MPa		
	5															PLT	PL(A)=0.40MPa		
	4	8.20	SILTSTONE: dark grey, 20% pale grey, fine grained sandstone laminations. Ashfield Shale		FR	8.20	H				8.37m: B, 0°, PR, SN Fe, SM 8.53-8.55m: B x2, 0°, PR, VNR Clay, SM				8	PLT	PL(A)=0.51MPa		
	3							100	99		9.28m: EW, Clay 15mm				9	PLT	PL(A)=1.2MPa		
																PLT	PL(A)=1.7MPa		

NOTES: (R)Soil origin is "probable" unless otherwise stated.

Generated with CORE-GS by Geroc - Split Soil-Rock Log

PLANT: Commachio 205
METHOD: AD/T to 3.0m, NMLC to 16.52m
REMARKS: Groundwater well installed with gatic cover at surface

OPERATOR: Ground Test (JJ)

LOGGED: JL
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

BOREHOLE LOG

CLIENT: Billbergia Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: 2 Llewellyn Street, Rhodes, NSW

SURFACE LEVEL: 12.3 AHD
COORDINATE: E:323068.1, N:6255231.8
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH3
PROJECT No: 229157.01
DATE: 12/08/24 - 13/08/24
SHEET: 3 of 3

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	WEATH. (RS, XW, HW, DW, MW, SW, FR)	DEPTH (m)	STRENGTH (VL, L, M, H, VH, EH)	RECOVERY (%)	RQD	FRACTURE SPACING (m) (0.05, 0.06, 0.08, 0.10, 0.20)	DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	BACKFILL	WELL PIPE
	2	11	[CONT] SILTSTONE: dark grey, 20% pale grey, fine grained sandstone laminations. Ashfield Shale					100	99						11	PLT	PL(A)=1.9MPa	Gravel	
	1	12	From 11.40m: 5-15% pale grey, fine grained sandstone laminations												12	PLT	PL(A)=1.5MPa		
	0	13			FR		H	100	84						13	PLT	PL(A)=1.6MPa		
	-1	14									14.25-14.38m: SZ, 110mm 14.42-14.53m: JT x3, 30-50°, PR, CN, SM 14.63-14.81m: SZ, 180mm				14	PLT	PL(A)=1.3MPa		
	-2	15									14.95-15.35m: JT x7, 30-70°, PR, VNR Clay, SM				15	PLT	PL(A)=1.4MPa		
	-3	15.70	SILTSTONE: dark grey, 1% pale grey, fine grained sandstone laminations. Ashfield Shale					100	72		15.65m: JT, 70-90°, CU, TI 15.80m: JT, 80°, PR, TI 16.05m: JT, 80°, PR, CN, SM 16.15m: JT, 20-30°, CU, CN, SM				16	PLT	PL(A)=1.0MPa		
	-4	16														PLT	PL(A)=1.0MPa		
	-5	17	Borehole discontinued at 16.52m depth. Target depth reached.																
	-6	18																	
	-7	19																	

NOTES: (#)Soil origin is "probable" unless otherwise stated.

PLANT: Commachio 205
METHOD: AD/T to 3.0m, NMLC to 16.52m
REMARKS: Groundwater well installed with gatic cover at surface

OPERATOR: Ground Test (JJ)

LOGGED: JL
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Split Soil-Rock Log

BOREHOLE LOG

CLIENT: Billbergia Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: 2 Llewellyn Street, Rhodes, NSW

SURFACE LEVEL: 8.5 AHD
COORDINATE: E:323146.8, N:6255218.7
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH4
PROJECT No: 229157.01
DATE: 13/08/24 - 14/08/24
SHEET: 1 of 3

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TESTING AND REMARKS: TEST TYPE	TESTING AND REMARKS: RESULTS AND REMARKS	BACKFILL	WELL PIPE
	8	0.40	FILL / CLAY, trace sand, trace gravel: dark brown; medium to high plasticity; fine to medium sand; fine, siltstone gravel.		FILL	NA			D	0.10 0.20	0.10 0.20			Gravel Flush cover	
	1		Silty CLAY (CI-CH), trace gravel: orange-brown; medium to high plasticity; fine, ironstone gravel.		RS	St to VSt	w=PL		D D SPT/SPT	0.40 0.50 0.90 1.00 1.45	0.40 0.50 0.90 1.00 1.45	SPT	5,8,12 N=20		
▼ 15/08/24	7	1.70	Silty CLAY (CI-CH), with gravel: pale grey mottled orange-brown; medium to high plasticity; fine to coarse, ironstone gravel.		RS	VSt to H	w<PL							Bentonite	
▼ 20/08/24	6	2.60	Continued as rock						SPT/SPT	2.50	2.50	SPT	25/100	Gravel	

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

PLANT: Commachio 205
METHOD: Hand auger to 1.2m, AD/T to 2.6m, NMLC to 15.18m
REMARKS: Groundwater well installed with gatic cover at surface

OPERATOR: Ground Test (JJ)

LOGGED: JDB/JL
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Split Soil-Rock Log

BOREHOLE LOG

CLIENT: Billbergia Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: 2 Llewellyn Street, Rhodes, NSW

SURFACE LEVEL: 8.5 AHD
COORDINATE: E:323146.8, N:6255218.7
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH4
PROJECT No: 229157.01
DATE: 13/08/24 - 14/08/24
SHEET: 2 of 3

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD	FRACTURE SPACING (m)	DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	BACKFILL	WELL PIPE
15/08/24	8	0.00	Continued from soil			2.60									0			Gravel	Gravel
20/08/24	7	2.70	CORE LOSS: 100mm			2.70					2.79m: EW, Clay 10mm 2.84m: B, 0°, PR, CT Clay 2 mm				1			Flush cover	
	6		SILTSTONE: dark grey and brown, 5-10% fine grained sandstone laminations, 1% iron-indurated bands. Ashfield Shale			3.06	M				3.06-3.11m: DS, Clay 50mm, (JT 50°, PR)								
						3.12	VL				3.17m: B, 0°, PR, CT Clay 1 mm								
							L	94	12		3.34m: EW, Clay 5mm 3.38m: EW, Clay 40mm, (JT 40°, PR)								
						3.74	VL to L				3.45m: B, 0°, PR, CT Clay 2 mm 3.55m: JT, 50°, PR, CT Clay 2mm, RF				2			Bentonite	
						4.35	SOIL			SOIL	3.63m: EW, Clay 20mm 3.85m: JT, 40°, PR, SN Fe, RF								
						4.41	VL to L	100	0		4.06-4.18m: B x3, 5°, PR, VNR Clay, RF 4.20-4.35m: JT x4, 30-50°, PR, VNR Clay, SM 4.35-4.41m: EW, Clay 60 mm								
					XW	5.02	SOIL			SOIL	4.44-4.70m: B x6, 0-1°, PR, SN Fe, SM 4.72m: JT, 50°, PR, SN Fe, RF				3	PLT	PL(A)=0.59MPa		
						5.17	L				4.87m: EW, Clay 10mm 4.99m: JT, 40°, PR, CN, SM 5.02m: EW, Clay 30mm 5.08-5.17m: EW, Clay 90 mm								
						6.05	SOIL			SOIL	5.28-5.45m: JT x4, 40-80°, UN, HE								
	6.20		SILTSTONE: dark grey-brown; indistinct bedding at 0-10°. Ashfield Shale			6.18	L				5.61m: EW, Clay 10mm 5.65m: DS, Clay 40mm								
						6.32	VL	100	27		5.85-5.95m: JT x3, 60-70°, UN, VNR Clay 6.05m: EW, Clay 40mm				4	PLT	PL(A)=0.06MPa		
						6.40	L				6.10-6.40m: JT x6, 40-70°, PR, VNR Clay, SM 6.45-6.70m: JT x6, 40-80°, UN, HE								
						7.32	VL				6.82-7.08m: B x3, 10°, UN, SM 7.28m: JT, 70°, PR, CT Clay 2mm, (7.15-7.42m)								
					MW	7.52					7.43-7.48m: DS, Clay 50mm				5	PLT	PL(A)=0.07MPa		
	7.65		SILTSTONE: dark grey. Ashfield Shale			7.65					7.48m: JT, 60°, PR, CT Clay 2mm, SM 7.55-7.65m: JT x3, 40-70°, PR, SN Fe, RF 7.68m: B, 10°, PR, SN Fe, RF								
							M				7.85-8.23m: JT x5, 40-80°, PR, CN, RF 8.40m: JT, 60°, PR, CN, RF					PLT	PL(A)=0.11MPa		
					FR										6			Gravel	
																PLT	PL(A)=0.27MPa		
															7				
																PLT	PL(A)=0.76MPa		
								100	71						8				
																PLT	PL(A)=0.60MPa		
	9.58		SANDSTONE: grey, fine grained. Ashfield Shale			9.47	H				9.24-9.58m: JT x7, 40-70°, PR, CN, RF				9				
																PLT	PL(A)=1.9MPa		

NOTES: (R)Soil origin is "probable" unless otherwise stated.

Generated with CORE-GS by Geroc - Split Soil-Rock Log

PLANT: Commachio 205
METHOD: Hand auger to 1.2m, AD/T to 2.6m, NMLC to 15.18m
REMARKS: Groundwater well installed with gatic cover at surface

OPERATOR: Ground Test (JJ)

LOGGED: JDB/JL
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

BOREHOLE LOG

CLIENT: Billbergia Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: 2 Llewellyn Street, Rhodes, NSW

SURFACE LEVEL: 8.5 AHD
COORDINATE: E:323146.8, N:6255218.7
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH4
PROJECT No: 229157.01
DATE: 13/08/24 - 14/08/24
SHEET: 3 of 3

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD	FRACTURE SPACING (m)	DEFECTS & REMARKS	SAMPLE REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	BACKFILL	WELL PIPE
			[CONT] SANDSTONE: grey, fine grained. Ashfield Shale					100	71										
		10.60	INTERBEDDED SILTSTONE (70%) AND SANDSTONE (30%): SILTSTONE: dark grey SANDSTONE: grey, fine grained. Ashfield Shale								10.63m: JT, 10°, PR, CN, RF								
								100	100										
					FR		H				12.55m: JT, 80°, ST, CN, RF, partially tight (12.43-12.72)								
		13.00	SILTSTONE: dark grey, 1-5% pale grey, fine grained sandstone laminations. Ashfield Shale																
								100	100		14.90m: JT, 80-90°, UN, CN, RF, partially tight (14.81-15.00)								
		15.18	Borehole discontinued at 15.18m depth. Target depth reached.																

NOTES: (R)Soil origin is "probable" unless otherwise stated.

PLANT: Commachio 205
METHOD: Hand auger to 1.2m, AD/T to 2.6m, NMLC to 15.18m
REMARKS: Groundwater well installed with gatic cover at surface

OPERATOR: Ground Test (JJ)

LOGGED: JDB/JL
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Split Soil-Rock Log

BOREHOLE LOG

CLIENT: Billbergia Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: 2 Llewellyn Street, Rhodes, NSW

SURFACE LEVEL: 9.8 AHD
COORDINATE: E:323159.7, N:6255241.9
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH5
PROJECT No: 229157.01
DATE: 09/08/24 - 12/08/24
SHEET: 1 of 3

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TESTING AND REMARKS: TEST TYPE	TESTING AND REMARKS: RESULTS AND REMARKS	BACKFILL	WELL PIPE
		0.05	FILL / Sandy CLAY, with rootlets: dark brown; low plasticity; fine sand.		FILL		M		D	0.10 - 0.20				Gravel Flush cover	
		0.25	FILL / Gravelly SAND, with clay: pale grey; fine to medium; fine to medium, angular, bricks and building debris gravel.		FILL		w<PL		D	0.50 - 0.60					
		0.90	FILL / Gravelly CLAY: dark brown mottled orange-brown; medium to high plasticity; fine to medium, angular, bricks and building debris gravel.						D	0.90 - 1.00					
			CLAY (CI-CH), trace roots: pale grey mottled orange-brown; medium to high plasticity; bands of ironstone.		RS	St	w<PL		SPT	1.45		SPT	3,4,5 N=9	Bentonite	
20/08/24									D	1.60 - 1.70					
									D	2.00 - 2.10					
						VSt			D	2.40 - 2.50					
15/08/24									SPT	2.95		SPT	5,11,18 N=29		
		3.20	Silty CLAY: pale grey mottled brown; medium to high plasticity; ironstained; extremely weathered siltstone.		RS	H									
		3.70	Continued as rock												

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

PLANT: Bobcat
METHOD: AD/T to 3.7m, NMLC 15.06m
REMARKS: Groundwater well installed with gatic cover at surface

OPERATOR: Ground Test (CS)

LOGGED: LL/JDB
CASING: HW to 2.5m

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Split Soil-Rock Log

BOREHOLE LOG

CLIENT: Billbergia Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: 2 Llewellyn Street, Rhodes, NSW

SURFACE LEVEL: 9.8 AHD
COORDINATE: E:323159.7, N:6255241.9
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH5
PROJECT No: 229157.01
DATE: 09/08/24 - 12/08/24
SHEET: 2 of 3

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD	FRACTURE SPACING (m)	DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	BACKFILL	WELL PIPE
15/08/24 20/08/24	9.8	0	Continued from soil												0			Gravel Flush cover	
			SILTSTONE: brown and dark grey, distinct, laminated, 0°, thinly laminated to laminated, bands of ironstone. Ashfield Shale		HW	3.70 3.75	VL								1			Bentonite	
						4.10	SEAM	100	0	SEAM	3.80-3.93m: FG, 0-20°, PR, SN Fe 130mm, RF 3.97m: EW, Clay 30mm 4.00-4.45m: FG, 0-20°, PR, SN Fe 450mm, RF				2				
					HW	4.25 4.37	VL SEAM			SEAM					3				
					HW	4.50 4.60 4.73	VL				4.03m: EW, Clay 15mm 4.10-4.25m: DS, 0°, Clay 150mm 4.25-4.37m: JT x2, 80-90°, IR, SN Fe, RF 4.31-4.50m: DS, 190mm 4.56m: JT, 80°, PR, SN Fe, RF				4				
							SEAM	100	0	SEAM	4.64m: B, 0°, PR, SN Fe, RF 4.67m: EW, 40mm 4.73-4.84m: EW, 110mm 4.87-4.96m: EW, Clay 90 mm				5	PLT	PL(A)=1.1MPa		
						5.25	H				5.00-5.25m: DS, 250mm 5.32m: JT, 70-80°, IR, SN Fe, RF 5.35m: B, 0°, PR, SN Fe 5.41-5.64m: JT x5, 20°, PR, SN Fe, RF 5.49m: B, 0°, PR, SN Fe, RF 5.59m: DS, 20mm 5.62m: B, 0°, PR, SN Fe, RF 5.66-5.91m: B x6, 10-20°, PR, TI Fe, RF 5.93-6.22m: JT x6, 20-90°, IR, SN Fe, RF 6.29-6.35m: DS, Fe 60mm 6.39m: EW, 20°, 10mm 6.41-7.22m: FG x11, 20-70°, PR, SN Fe, RF 7.22-7.34m: EW, 20°, 120 mm 7.39-7.44m: JT x2, 20°, UN, SN Fe, SM 7.47m: EW, 40mm 7.67-7.88m: B x2, 0°, PR, SN Fe, RF 7.90-8.05m: JT x3, 80-90°, IR, CN, RF 8.38m: B, 5°, PR, CT Clay 1mm, SM 8.80-9.05m: JT x2, 50-70°, PR, CN, SM				6				
						5.58	L	100	37						7				
	7.50	7.50	SILTSTONE: dark grey; indistinct bedding at 0-10°. Ashfield Shale		FR		H	100	91						8	PLT PLT	PL(A)=1.2MPa PL(A)=1.1MPa		
								100	100						9	PLT	PL(A)=1.1MPa		
								100	100										

NOTES: (R)Soil origin is "probable" unless otherwise stated.

Generated with CORE-GS by Geroc - Split Soil-Rock Log

PLANT: Bobcat
METHOD: AD/T to 3.7m, NMLC 15.06m
REMARKS: Groundwater well installed with gatic cover at surface

OPERATOR: Ground Test (CS)

LOGGED: LL/JDB
CASING: HW to 2.5m

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

BOREHOLE LOG

CLIENT: Billbergia Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: 2 Llewellyn Street, Rhodes, NSW

SURFACE LEVEL: 9.8 AHD
COORDINATE: E:323159.7, N:6255241.9
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH5
PROJECT No: 229157.01
DATE: 09/08/24 - 12/08/24
SHEET: 3 of 3

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	WEATH. (RS, XW, HW, DW, MW, SW, FR)	DEPTH (m)	STRENGTH (VL, L, M, H, VH, EH)	RECOVERY (%)	RQD	FRACTURE SPACING (m) (0.05, 0.06, 0.08, 0.10, 0.20)	DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	BACKFILL	WELL PIPE
		10.48	[CONT] SILTSTONE: dark grey; indistinct bedding at 0-10°. Ashfield Shale								10.25-10.44m: JT x3, 30-60°, PR, CN, SM					PLT	PL(A)=1.2MPa	Bentonite	
	-1	11	INTERBEDDED SILTSTONE (50%) AND SANDSTONE (50%): SILTSTONE: dark grey SANDSTONE: grey and pale grey, fine grained. Mittagong Formation								10.94m: B, 5°, UN, CT Clay 2mm				11				
								100	100		11.42m: B, 5°, UN, VNR Clay, RF					PLT	PL(A)=1.0MPa		
	-2	12			FR		H				11.75m: JT, 20°, PR, CN, SM				12	PLT	PL(A)=2.0MPa		
											12.38m: JT, 40°, PR, CN, RF								
	-3	13									12.80m: JT, 70°, PR, CN, RF				13	PLT	PL(A)=2.8MPa		
											13.00m: JT, 60°, PR, CN, RF								
											13.34m: B, 0°, PR, VNR Clay, RF								
	-4	14						100	100		13.71m: JT, 20°, PR, CN, SM				14	PLT	PL(A)=1.3MPa		
											13.96m: JT, 20°, PR, CN, SM								
	-5	15									14.80m: JT, 60°, PR, tight				15	PLT	PL(A)=2.2MPa		
											14.92m: JT, 50°, PR, CN, SM								
			Borehole discontinued at 15.06m depth. Target depth reached.																
	-6	16																	
	-7	17																	
	-8	18																	
	-9	19																	
	-10																		

NOTES: (R)Soil origin is "probable" unless otherwise stated.

PLANT: Bobcat
METHOD: AD/T to 3.7m, NMLC 15.06m
REMARKS: Groundwater well installed with gatic cover at surface

OPERATOR: Ground Test (CS)

LOGGED: LL/JDB
CASING: HW to 2.5m

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Split Soil-Rock Log

BOREHOLE LOG

CLIENT: Billbergia Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: 2 Llewellyn Street, Rhodes, NSW

SURFACE LEVEL: 11.5 AHD
COORDINATE: E:323119.1, N:6255250.2
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH6
PROJECT No: 229157.01
DATE: 12/08/24
SHEET: 1 of 3

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TESTING AND REMARKS: TEST TYPE	TESTING AND REMARKS: RESULTS AND REMARKS
	11	0.80	FILL / CLAY: dark brown; medium to high plasticity; trace brick rubble and rootlets.		FILL	NA	w=PL		A A	0.10–0.20 0.40–0.50	0.10 0.20 0.40 0.50		
	10	2.00	Silty CLAY (CI-CH), trace gravel: red-brown; medium to high plasticity; fine, ironstone gravel.		RS	St	w<PL		A SPT	0.90–1.00 1.00–1.45	0.90 1.00 1.45	SPT	3,5,5 N=10
	9	3.50	Silty CLAY (CI-CH), with gravel: pale grey mottled red-brown; medium to high plasticity; fine to coarse, ironstone gravel.		RS	VSt becoming H	w<PL		A SPT	2.00–2.10 2.50–2.95	2.00 2.10 2.50 2.95	SPT	6,10,15 N=25
	8	3.70	SILTSTONE: brown; trace ironstone gravel, apparently very low strength. Ashfield Shale			NA	NA		SPT	3.50–3.61	3.50 3.61	SPT	25/110 (HB)
		4	Continued as rock								4		
	7	5									5		
	6	6									6		
	5	7									7		
	4	8									8		
	3	9									9		
	2												

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

PLANT: Explora 140
OPERATOR: Ground Test (SS)
LOGGED: JDB
METHOD: AD/T to 2.50m, WB to 3.7m. NMLC to 17.35m
CASING: Uncased
REMARKS: No free groundwater observed whilst augering. Borehole backfilled upon completion and made flush with surrounding surface levels

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

Generated with CORE-GS by Geroc - Split Soil-Rock Log

BOREHOLE LOG

CLIENT: Billbergia Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: 2 Llewellyn Street, Rhodes, NSW

SURFACE LEVEL: 11.5 AHD
COORDINATE: E:323119.1, N:6255250.2
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH6
PROJECT No: 229157.01
DATE: 12/08/24
SHEET: 2 of 3

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD	FRACTURE SPACING (m)	DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	BACKFILL	WELL PIPE
	11.5	0.00	Continued from soil												0.00				
			SILTSTONE: brown and dark grey; 5-10% fine grained sandstone laminations, distinct and indistinct bedding at 0-10°; ironstained. Ashfield Shale		HW	3.70	VL				3.76m: JT, 40°, PR, SN Fe, SM					PLT	PL(A)=0.32MPa		
						3.90	L	100	13		3.95-4.15m: B x3, 0-10°, PR, SN Fe, SM								
						4.65	VL				4.70-4.75m: EW, Clay 50 mm								
						4.85	L to M				4.81m: EW, Clay 10mm					PLT	PL(A)=0.45MPa		
						5.00										PLT	PL(A)=0.25MPa		
					MW	5.23	M				5.21-5.70m: B x7, 0-10°, PR, SN Fe, SM								
	5.80	5.80	SILTSTONE: dark grey; 10-20% pale grey, fine grained sandstone laminations, distinct bedding at 0-10°; 5-10% ironstained bands. Ashfield Shale			5.80										PLT	PL(A)=1.3MPa		
						6.00					6.08-6.45m: B x8, 0-10°, PR, SN Fe, SM								
								100	69		6.55-6.69m: B x2, 5°, PR, SN Fe, SM					PLT	PL(A)=1.6MPa		
					SW						6.95m: EW, 30°, Clay 10mm								
											7.05-7.48m: B x4, 5-10°, PR, SN Fe, SM					PLT	PL(A)=2.4MPa		
											7.52-7.54m: JT x2, 20-30°, PR, SN Fe, tight								
											7.75-7.97m: B x3, 5-10°, PR, SN Fe, SM								
	8.00	8.00	SILTSTONE: dark grey; 10-15% pale grey, fine grained sandstone laminations, distinct bedding at 0-10°			8.00	H									PLT	PL(A)=1.6MPa		
											8.33-8.44m: B x2, 0°, PR, SN Fe, SM								
											8.73m: JT, 15°, PR, SN Fe, SM,								
					FR						8.80m: B, 5°, PR, SN Fe, SM					PLT	PL(A)=1.2MPa		
								100	89		9.35m: JT, 70-90°, UN, SN Fe, RF, (9.11-9.43m)								
											9.70-9.95m: JT x2, 30-40°, PR, displaced bedding								

NOTES: (R)Soil origin is "probable" unless otherwise stated.

PLANT: Explora 140
OPERATOR: Ground Test (SS)
LOGGED: JDB
METHOD: AD/T to 2.50m, WB to 3.7m. NMLC to 17.35m
CASING: Uncased
REMARKS: No free groundwater observed whilst augering. Borehole backfilled upon completion and made flush with surrounding surface levels

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Split Soil-Rock Log

BOREHOLE LOG

CLIENT: Billbergia Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: 2 Llewellyn Street, Rhodes, NSW

SURFACE LEVEL: 11.5 AHD
COORDINATE: E:323119.1, N:6255250.2
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH6
PROJECT No: 229157.01
DATE: 12/08/24
SHEET: 3 of 3

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	WEATH. (RS, XW, HW, DW, MW, SW, FR)	DEPTH (m)	STRENGTH (VL, L, M, H, VH, EH)	RECOVERY (%)	RQD	FRACTURE SPACING (m) (0.05, 0.06, 0.08, 0.10, 0.20)	DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	BACKFILL	WELL PIPE
	1		[CONT] SILTSTONE: dark grey; 10-15% pale grey, fine grained sandstone laminations, distinct bedding at 0-10°					100	89		10. 05-10.30m: JT x4, 30-70°, PR, VNR Clay, SM 10. 35-10.55m: SZ				11	PLT	PL(A)=1.3MPa		
	0		From 10.50m: 1-5% pale grey, fine grained sandstone laminations								10. 90m: JT, 15°, PR, CN, SM 11. 15m: JT, 70°, PR, CN, SM				12	PLT	PL(A)=1.2MPa		
		11.60	SILTSTONE: dark grey. Ashfield Shale								11. 65m: JT, 60-80°, UN, CN, SM				13	PLT	PL(A)=0.90MPa		
	-1							100	93		12. 20m: JT, 60°, PR, CN, SM 12. 45m: B, 0°, PR, CT Clay 3mm, SM 12. 50m: JT, 50°, PR, CN, SM 12. 85-12.92m: JT x3, 60-70°, PR, VNR Clay, SM				14	PLT	PL(A)=1.3MPa		
	-2				FR		H	100	76		13. 03-13.40m: JT x5, 40-70°, PR, CN, SM 13. 42-13.52m: SZ 13. 55-13.60m: JT x4, 50-60°, PR, VNR Clay, SM 13. 72m: JT, 30°, PR, VNR Clay, SM 13. 76m: B, 5°, PR, VNR Clay, SM, 13. 90m: JT, 40°, PR, CN, SM 13. 92-14.28m: JT x3, 50-60°, PR, CN, SM 14. 41-14.77m: JT x3, 60°, PR, CN, SM				15	PLT	PL(A)=1.1MPa		
	-3										14. 90m: JT, 70°, PR, CN, SM 15. 08m: JT, 30°, UN, CN, RF				16	PLT	PL(A)=1.1MPa		
	-4							100	100		15. 90m: JT, 60°, PR, CN, SM,				17	PLT	PL(A)=1.7MPa		
	-5		16.16m-16.65m: grey, fine grained sandstone																
	-6	17	17.08m: sandstone bed, 40mm 17.26m: sandstone clast, 30mm								16. 95m: JT, 50°, PR, VNR Clay, SM 17. 10-17.31m: JT x3, 40-60°, PR, CN, SM								
		18	Borehole discontinued at 17.35m depth. Target depth reached.																
	-7	19																	
	-8																		

NOTES: (R)Soil origin is "probable" unless otherwise stated.

PLANT: Explora 140
METHOD: AD/T to 2.50m, WB to 3.7m. NMLC to 17.35m
REMARKS: No free groundwater observed whilst augering. Borehole backfilled upon completion and made flush with surrounding surface levels

OPERATOR: Ground Test (SS)

LOGGED: JDB
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Split Soil-Rock Log

BOREHOLE LOG

CLIENT: Billbergia Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: 2 Llewellyn Street, Rhodes, NSW

SURFACE LEVEL: 13.9 AHD
COORDINATE: E:323181.3, N:6255313.7
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH7
PROJECT No: 229157.01
DATE: 13/08/24
SHEET: 1 of 3

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*)	DENSITY.(*)	MOISTURE	REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TESTING AND REMARKS: TEST TYPE	TESTING AND REMARKS: RESULTS AND REMARKS	BACKFILL / WELL PIPE
	13	0.30	FILL / Silty CLAY: grey; low plasticity; trace of grass root, fine sand, brick fragments.		FILL	(S)		w<PL		A	0.10–0.20	0.10			Backfill
		0.50	FILL / CLAY: orange-brown and grey; medium plasticity; trace of gravel, brick fragments.		FILL	(F) to (St)				A	0.40–0.50	0.40			
			CLAY (CH): brown then pale grey; high plasticity.		RS	St		w=PL		A	0.90–1.00	0.90			
										ES	1.00–1.45	1.00			
		1.70	SILTSTONE: pale grey then grey-brown. Ashfield Shale									1.45			
▼ 20/08/24	12	2										2			
		2.80	Continued as rock							ES	2.50–2.65	2.50			
▼ 15/08/24	11	3										2.65			
	10	4										3			
	9	5										4			
	8	6										5			Bentonite
	7	7										6			
	6	8										7			
	5	9										8			
	4											9			

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

PLANT: Commachio 305
METHOD: AD/T to 2.5m, WB to 2.8m, NMLC 18.1m
REMARKS: Groundwater well installed with gatic cover at surface

OPERATOR: Ground Test (LC)

LOGGED: SI
CASING: HW to 2.5m

Refer to explanatory notes for symbol and abbreviation definitions

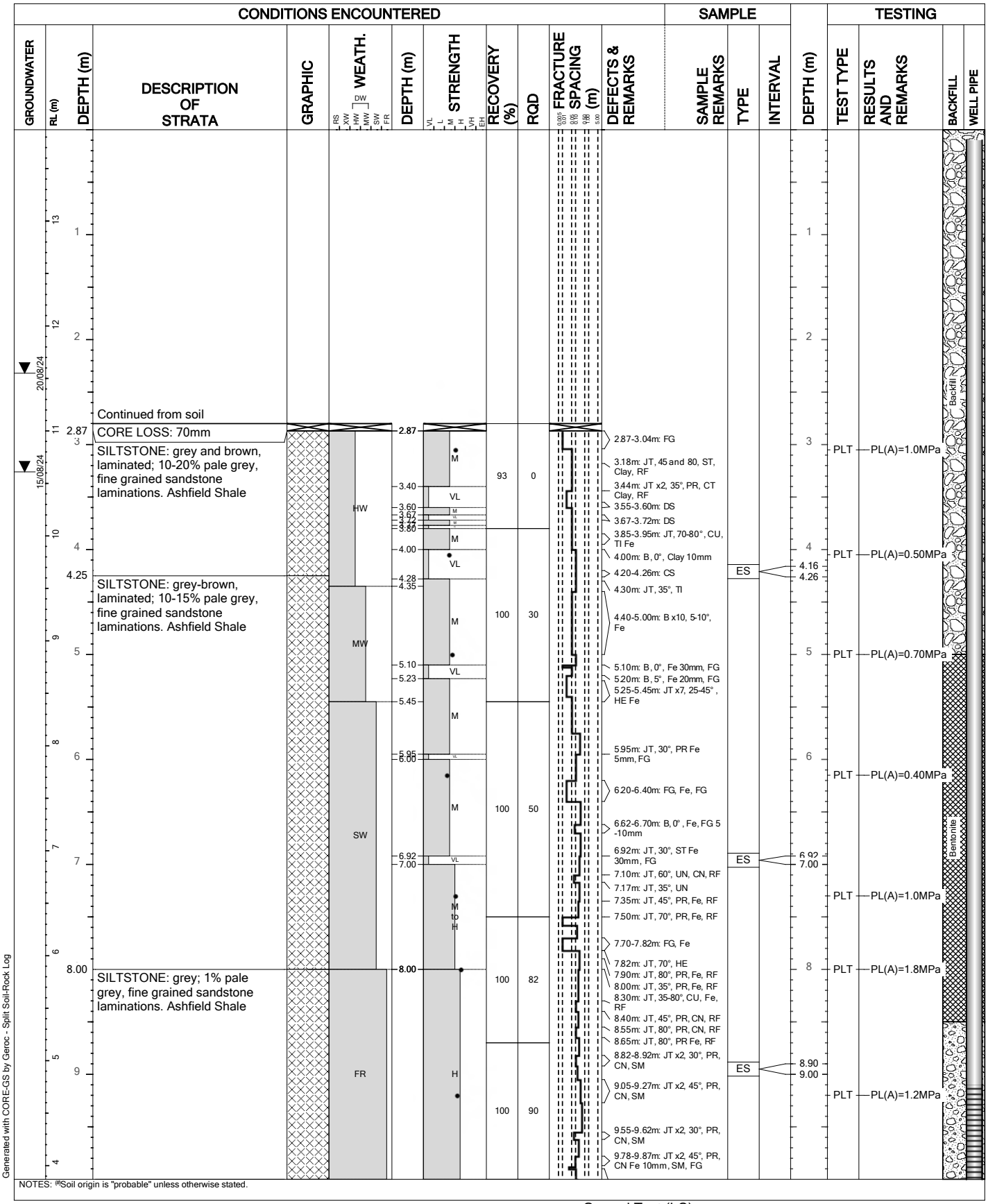
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BOREHOLE LOG

CLIENT: Billbergia Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: 2 Llewellyn Street, Rhodes, NSW

SURFACE LEVEL: 13.9 AHD
COORDINATE: E:323181.3, N:6255313.7
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH7
PROJECT No: 229157.01
DATE: 13/08/24
SHEET: 2 of 3



Generated with CORE-GS by Geroc - Split Soil-Rock Log

NOTES: (#)Soil origin is "probable" unless otherwise stated.

PLANT: Commachio 305
METHOD: AD/T to 2.5m, WB to 2.8m, NMLC 18.1m
REMARKS: Groundwater well installed with gatic cover at surface

OPERATOR: Ground Test (LC)

LOGGED: SI
CASING: HW to 2.5m

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

BOREHOLE LOG

CLIENT: Billbergia Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: 2 Llewellyn Street, Rhodes, NSW

SURFACE LEVEL: 13.9 AHD
COORDINATE: E:323181.3, N:6255313.7
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH7
PROJECT No: 229157.01
DATE: 13/08/24
SHEET: 3 of 3

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD	FRACTURE SPACING (m)	DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	BACKFILL	WELL PIPE
	13.9	0	[CONT] SILTSTONE: grey; 1% pale grey, fine grained sandstone laminations. Ashfield Shale		FR	12.00 12.12	H	100	90		9.90m: JT, 30°, PR, Fe 5mm, RF, FG 10.00m: JT x2, 45-55°, ST, CN, SM 10.13m: JT, 25°, PR, 5mm, SM, FG 10.23m: JT, 45 and 90, ST, CN, SM 10.38m: JT, 70°, UN, 10mm, RF, FG 10.45m: JT, 30°, PR, CN, SM 10.60-10.80m: JT, 70 and 90, ST, CN, SM 10.75m: JT, 25°, PR, CN, SM 11.50m: JT, 45-70°, CU, CN, SM 11.70m: JT, 45°, PR, CN, SM 11.82m: JT, 30-45°, CU, CN, SM 11.92m: JT x2, 30-45°, PR, CN, SM 12.02-12.12m: JT, 30-45°, PR, SM, SZ, FG 12.12-12.30m: JT, 85°, PR, CN, SM 12.65-12.75m: JT, 85°, PR, CN, SM				11 12 13	PLT PLT PLT	PL(A)=1.5MPa PL(A)=1.4MPa PL(A)=2.0MPa PL(A)=1.3MPa	Gravel	
								100	94										
	13.95		SANDSTONE: pale grey, fine grained, laminated; 20% dark grey siltstone laminations. Mittagong Sandstone		SW	13.95 14.00 14.50 14.65 14.85 15.00 15.25 15.30 15.40	M VL M H	100	88		13.10m: JT, 70°, PR, CN, SM 13.30m: JT, 45°, PR, CN, SM 13.60m: JT, 35°, PR, CN, SM 13.85m: JT, 25°, PR, CN, SM 13.90-13.95m: CS 14.03m: JT x2, 45-85°, PR, CN, SM, TI 14.20-14.26m: FG 14.35-14.45m: JT, 90°, TI, FG 14.50m: JT, 70°, TI 14.55-14.65m: CS 14.80m: JT, 80 and 90, ST, CN, RF 14.95m: JT, 70°, PR, Clay, RF 15.15m: JT, 80°, PR, CN, RF 15.25-15.30m: JT, TI, SZ, FG				13 14 15	PLT PLT PLT	PL(A)=1.3MPa PL(A)=0.90MPa PL(A)=1.1MPa		
	15.60		SANDSTONE: pale grey, medium grained. Hawkesbury Sandstone		FR		H	100	100		17.25m: JT, 45°, PR, Clay, RF 17.35m: JT x2, 80°, UN, CN, RF				16 17 18	PLT PLT PLT	PL(A)=2.0MPa PL(A)=1.6MPa PL(A)=3.0MPa		
			Borehole discontinued at 18.10m depth. Target depth reached.																

NOTES: (R)Soil origin is "probable" unless otherwise stated.

PLANT: Commachio 305
METHOD: AD/T to 2.5m, WB to 2.8m, NMLC 18.1m
REMARKS: Groundwater well installed with gatic cover at surface

OPERATOR: Ground Test (LC)

LOGGED: SI
CASING: HW to 2.5m

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Split Soil-Rock Log

Reditus Consulting Pty Ltd

Lvl 1, Suite 1/29-33 Waratah St, Kirrawee NSW 2232, Australia

Phone: (02) 9521 6567

Boring No.: BH01

Easting	**: 0.00**	**Drill Supplier**	**:**	**Job Number**	**: 24109**	**Sheet**	**: 1 OF 1**
Northing	**: 0.00**	**Driller Company**	**:**	**Client**	**: Billbergia Pty Ltd**		
Elevation	**: Not Surveyed**	**Logged By**	**: TW**	**Project**	**: Detailed Site Investigation and Geotechnical Assessment**		
Total Depth	**: 0.3 m**	**Date**	**: 29/07/2024**	**Location**	**: Llewellyn Street, Rhodes NSW**		

Drilling Method	Depth (m)	Samples: Discrete	PID (ppm): PID	Soil Origin	Graphic Log	Moisture	Material Description	Comments	Water
Hand Auger		BH01_0.1	0.8	Fill		D	Fill. Clayey to gravelly SAND. SC: low to medium plasticity clay, loose, dark brown, fine to coarse grained, medium sized gravel, dry.		
							Fill. Sandy CLAY. CI: medium plasticity, soft to firm, dark brown, fine to coarse grained sand, inorganic, dry, becoming natural. still some remaining fill from top sub-surface layer. no odour, anthropogenic material or staining. .	Becoming natural. Still some remaining fill from top sub-surface layer. No odour, anthropogenic material or staining.	
		BH01_0.3	1.1			SLM-D	Fill. Sandy CLAY. CI: medium plasticity, soft to firm, dark brown, fine to coarse grained sand, inorganic, slightly moist to dry, no odour, anthropogenic material or staining. some rootlets present..	No odour, anthropogenic material or staining. Some rootlets present.	
							BH01 Terminated at 0.3m (Target Depth)		

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Boring No.: BH02

Easting	: 0.00	**Drill Supplier**	:	**Job Number**	: 24109
Northing	: 0.00	**Driller Company**	:	**Client**	: Billbergia Pty Ltd
Elevation	: Not Surveyed	**Logged By**	: TW	**Project**	: Detailed Site Investigation and Geotechnical Assessment
Total Depth	: 0.25 m	**Date**	: 29/07/2024	**Location**	: Llewellyn Street, Rhodes NSW

Sheet : 1 OF 1

Drilling Method	Depth (m)	Samples	PID (ppm)	Soil Origin	Graphic Log	Moisture	Material Description	Comments	Water
				Fill		D	Fill. Clayey to gravelly SAND. SC: low to medium plasticity clay, loose, dark brown, fine to coarse grained, medium sized gravel, dry.		
			0.7				Fill. Sandy CLAY. CI: medium plasticity, soft to firm, dark brown, fine to coarse grained sand, inorganic, dry, becoming natural. still some remaining fill from top sub-surface layer. no odour, anthropogenic material or staining. .	Becoming natural. Still some remaining fill from top sub-surface layer. No odour, anthropogenic material or staining.	
						SLM-D	Fill. Sandy CLAY. CI: medium plasticity, soft to firm, dark brown, fine to coarse grained sand, inorganic, slightly moist to dry, no odour, anthropogenic material or staining..	No odour, anthropogenic material or staining.	
			0.9				**BH02 refusal at 0.25m (Refusal on tree root)**		

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Boring No.: BH03

Easting	**: 0.00**	**Drill Supplier**	**:**	**Job Number**	**: 24109**	**Sheet**	**: 1 OF 1**
Northing	**: 0.00**	**Driller Company**	**:**	**Client**	**: Billbergia Pty Ltd**		
Elevation	**: Not Surveyed**	**Logged By**	**: TW**	**Project**	**: Detailed Site Investigation and Geotechnical Assessment**		
Total Depth	**: 0.3 m**	**Date**	**: 29/07/2024**	**Location**	**: Llewellyn Street, Rhodes NSW**		

Drilling Method	Depth (m)	Samples: Discrete	PID (ppm): PID	Soil Origin	Graphic Log	Moisture	Material Description	Comments	Water
Hand Auger				Fill		D	Fill. SAND. SW: loose to medium dense, dark brown with yellow mottled, fine to coarse grained, dry, no odour, anthropogenic material or staining. topsoil.	No odour, anthropogenic material or staining. Topsoil	
		BH01_0.1	0.8				Fill. Clayey SAND. SC: medium plasticity clay, loose to medium dense, dark brown, fine to coarse grained, dry, becoming natural. still some remaining fill from top sub-surface layer. no odour, anthropogenic material or staining. .	Becoming natural. Still some remaining fill from top sub-surface layer. No odour, anthropogenic material or staining.	
				Natural			Natural. CLAY. CL: soft to firm, low plasticity, dark brown with orange and red mottled, inorganic, dry, no odour, anthropogenic material or staining. some rootlets present..	No odour, anthropogenic material or staining. Some rootlets present.	
		BH01_0.3	1.1						
							BH03 Terminated at 0.3m (Target Depth)		

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Boring No.: BH04

Easting	**: 0.00**	**Drill Supplier**	**:**	**Job Number**	**: 24109**	**Sheet**	**: 1 OF 1**
Northing	**: 0.00**	**Driller Company**	**:**	**Client**	**: Billbergia Pty Ltd**		
Elevation	**: Not Surveyed**	**Logged By**	**: TG**	**Project**	**: Detailed Site Investigation and Geotechnical Assessment**		
Total Depth	**: 0.3 m**	**Date**	**: 29/07/2024**	**Location**	**: Llewellyn Street, Rhodes NSW**		

Drilling Method	Depth (m)	Samples: Discrete	PID (ppm): PID	Soil Origin	Graphic Log	Moisture	Material Description	Comments	Water
Hand Auger				grass			Grass.		
				Fill		D	Fill. SAND. SW: loose to medium dense, dark brown with mottled yellow, fine to coarse grained, dry.		
		BH04_0.15	1.2				Fill. Clayey SAND. SC: medium plasticity clay, loose to medium dense, dark brown, fine to coarse grained, dry, no odour, anthropogenic material or staining. becoming natural with depth.	No odour, anthropogenic material or staining. Becoming natural with depth	
				Natural		W-M	Natural. SAND. SW: loose, pale yellow, fine to medium grained, wet to moist.		
		BH04_0.3	1.3			M	Natural. CLAY. CL-CI: soft to firm, low to medium plasticity, dark brown, trace fine to medium grained sand, inorganic, moist.		
							BH04 Terminated at 0.3m		

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Boring No.: BH05

Easting	: 0.00	**Drill Supplier**	:	**Job Number**	: 24109	**Sheet**	: 1 OF 1
Northing	: 0.00	**Driller Company**	:	**Client**	: Billbergia Pty Ltd		
Elevation	: Not Surveyed	**Logged By**	: TW	**Project**	: Detailed Site Investigation and Geotechnical Assessment		
Total Depth	: 0.3 m	**Date**	: 29/07/2024	**Location**	: Llewellyn Street, Rhodes NSW		

Drilling Method	Depth (m)	Samples: Discrete	PID (ppm): PID	Soil Origin	Graphic Log	Moisture	Material Description	Comments	Water
Hand Auger				grass			Grass.		
		BH05_0.1	1.2	Fill		D	Fill. Clayey SAND. SC: low plasticity clay, medium dense, dark brown, fine to coarse grained, dry, no odour, anthropogenic material or staining..	No odour, anthropogenic material or staining.	
		BH05_0.3	1.4	Natural		SLM-D	Natural. CLAY. CL-CI: soft to firm, low to medium plasticity, dark brown, inorganic, slightly moist to dry, with tree roots.	with tree roots	
							BH05 Terminated at 0.3m		

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Boring No.: BH06

Easting	**: 0.00**	**Drill Supplier**	**:**	**Job Number**	**: 24109**	**Sheet**	**: 1 OF 1**
Northing	**: 0.00**	**Driller Company**	**:**	**Client**	**: Billbergia Pty Ltd**		
Elevation	**: Not Surveyed**	**Logged By**	**: TG**	**Project**	**: Detailed Site Investigation and Geotechnical Assessment**		
Total Depth	**: 0.35 m**	**Date**	**: 29/07/2024**	**Location**	**: Llewellyn Street, Rhodes NSW**		

Drilling Method	Depth (m)	Samples: Discrete	PID (ppm): PID	Soil Origin	Graphic Log	Moisture	Material Description	Comments	Water
Hand Auger		BH06_0.1	1.0	Fill		SLM-D	Fill. Clayey SAND. SC: low plasticity clay, medium dense, dark brown, fine to coarse grained, slightly moist to dry, no odour, anthropogenic material or staining..	No odour, anthropogenic material or staining.	
		BH06_0.3	0.7	Natural		D	Natural. CLAY. CL: firm to stiff, low plasticity, dark brown, trace fine to coarse grained sand, inorganic, dry, no odour, anthropogenic material or staining..	No odour, anthropogenic material or staining.	
							BH06 Terminated at 0.35m		

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Boring No.: BH07

Easting	**: 0.00**	**Drill Supplier**	**:**	**Job Number**	**: 24109**	**Sheet**	**: 1 OF 1**
Northing	**: 0.00**	**Driller Company**	**:**	**Client**	**: Billbergia Pty Ltd**		
Elevation	**: Not Surveyed**	**Logged By**	**: TG**	**Project**	**: Detailed Site Investigation and Geotechnical Assessment**		
Total Depth	**: 0.3 m**	**Date**	**: 29/07/2024**	**Location**	**: Llewellyn Street, Rhodes NSW**		

Drilling Method	Depth (m)	Samples: Discrete	PID (ppm): PID	Soil Origin	Graphic Log	Moisture	Material Description	Comments	Water
Hand Auger				grass			Grass.		
		BH07_0.1	0.6	Fill		SLM-D	Fill. SAND. SW: loose, dark brown, fine to coarse grained, slightly moist to dry, no odour, anthropogenic material or staining..	No odour, anthropogenic material or staining.	
							Fill. Clayey SAND. SC: low to medium plasticity clay, medium dense, dark brown, fine to coarse grained, slightly moist to dry, no odour, anthropogenic material or staining.	No odour, anthropogenic material or staining	
		BH07_0.3	0.8	Natural			Natural. CLAY. CL-CI: firm, low to medium plasticity, dark brown, inorganic, slightly moist to dry.		
							BH07 Terminated at 0.3m		

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Boring No.: BH08

Easting	**: 0.00**	**Drill Supplier**	**:**	**Job Number**	**: 24109**	**Sheet**	**: 1 OF 1**
Northing	**: 0.00**	**Driller Company**	**:**	**Client**	**: Billbergia Pty Ltd**		
Elevation	**: Not Surveyed**	**Logged By**	**: TG**	**Project**	**: Detailed Site Investigation and Geotechnical Assessment**		
Total Depth	**: 0.15 m**	**Date**	**: 29/07/2024**	**Location**	**: Llewellyn Street, Rhodes NSW**		

Drilling Method	Depth (m)	Samples: Discrete	PID (ppm): PID (ppm)	Soil Origin	Graphic Log	Moisture	Material Description	Comments	Water
Hand Auger				Non-Soil			Brick		
				Fill		SLM-D	Fill. Silty to sandy PEAT. PT: loose to medium dense, dark brown and black, slightly moist to dry, no odour, anthropogenic material or staining..	No odour, anthropogenic material or staining.	
		BH08_0.1	1.1						
							BH08 refusal at 0.15m (tree roots)		

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Boring No.: BH09

Easting	**: 0.00**	**Drill Supplier**	**:**	**Job Number**	**: 24109**	**Sheet**	**: 1 OF 1**
Northing	**: 0.00**	**Driller Company**	**:**	**Client**	**: Billbergia Pty Ltd**		
Elevation	**: Not Surveyed**	**Logged By**	**: TG**	**Project**	**: Detailed Site Investigation and Geotechnical Assessment**		
Total Depth	**: 0.3 m**	**Date**	**: 29/07/2024**	**Location**	**: Llewellyn Street, Rhodes NSW**		

Drilling Method	Depth (m)	Samples: Discrete	PID (ppm): PID	Soil Origin	Graphic Log	Moisture	Material Description	Comments	Water
Hand Auger				grass			Grass.		
				Fill		SLM-D	Fill. Clayey to sandy PEAT. PT: loose to medium dense, dark brown, slightly moist to dry, no odour, anthropogenic material or staining..	No odour, anthropogenic material or staining.	
		BH09_0.1	0.9	Natural			Natural. CLAY. CL-CI: soft to firm, low to medium plasticity, dark brown, inorganic, slightly moist to dry.		
		BH09_0.3	0.8						
							BH09 Terminated at 0.3m		

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Boring No.: BH10

Easting	: 0.00	**Drill Supplier**	:	**Job Number**	: 24109
Northing	: 0.00	**Driller Company**	:	**Client**	: Billbergia Pty Ltd
Elevation	: Not Surveyed	**Logged By**	: TG	**Project**	: Detailed Site Investigation and Geotechnical Assessment
Total Depth	: 0.3 m	**Date**	: 29/07/2024	**Location**	: Llewellyn Street, Rhodes NSW

Sheet : 1 OF 1

Drilling Method	Depth (m)	Samples: Discrete	Samples: Trip	Samples: Dup	PID (ppm)	Soil Origin	Graphic Log	Moisture	Material Description	Comments	Water
Hand Auger						grass			Grass.		
						Fill		SLM-D	Fill. Silty to sandy PEAT. PT: loose to medium dense, dark brown, slightly moist to dry, no odour, anthropogenic material or staining..	No odour, anthropogenic material or staining.	
		BH10_0.1	TRIP01	DUP01	1.0						
						Reworked Natural			Reworked natural. CLAY. CL-CI: soft to firm, low to medium plasticity, dark brown, inorganic, slightly moist to dry, anthropogenic material including terracotta present..	Anthropogenic material including terracotta present.	
		BH10_0.3			1.1						
									BH10 Terminated at 0.3m		

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Boring No.: BH11

Easting	: 0.00	**Drill Supplier**	:	**Job Number**	: 24109	**Sheet**	: 1 OF 1
Northing	: 0.00	**Driller Company**	:	**Client**	: Billbergia Pty Ltd		
Elevation	: Not Surveyed	**Logged By**	: TG	**Project**	: Detailed Site Investigation and Geotechnical Assessment		
Total Depth	: 0.2 m	**Date**	: 29/07/2024	**Location**	: Llewellyn Street, Rhodes NSW		

Drilling Method	Depth (m)	Samples – Discrete	PID (ppm) – PID	Soil Origin	Graphic Log	Moisture	Material Description	Comments	Water
Hand Auger		BH11_0.05	0.5	Fill		SLM-D	Fill. SAND. SW: loose to medium dense, dark brown, fine to coarse grained, slightly moist to dry, no odour, anthropogenic material or staining. topsoil.	No odour, anthropogenic material or staining. Topsoil	
				Natural			Natural. CLAY. CL-CI: soft to firm, low to medium plasticity, dark brown, inorganic, slightly moist to dry.		
		BH11_0.2	0.9						
							BH11 Terminated at 0.2m		

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Boring No.: BH12

Easting	: 0.00	**Drill Supplier**	:	**Job Number**	: 24109	**Sheet**	: 1 OF 1
Northing	: 0.00	**Driller Company**	:	**Client**	: Billbergia Pty Ltd		
Elevation	: Not Surveyed	**Logged By**	: TG	**Project**	: Detailed Site Investigation and Geotechnical Assessment		
Total Depth	: 0.15 m	**Date**	: 29/07/2024	**Location**	: Llewellyn Street, Rhodes NSW		

Drilling Method	Depth (m)	Samples	PID (ppm)	Soil Origin	Graphic Log	Moisture	Material Description	Comments	Water
		Discrete	PID						
Hand Auger		BH12_0.15	2.8	Fill		SLM-D	Fill. Clayey SAND. SC: low to medium plasticity clay, loose to medium dense, dark brown, fine to medium grained, slightly moist to dry, increasing clay content with depth.	increasing clay content with depth	
							BH12 refusal at 0.15m (tree roots)		

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Boring No.: BH13

Easting	**: 0.00**	**Drill Supplier**	**:**	**Job Number**	**: 24109**	**Sheet**	**: 1 OF 1**
Northing	**: 0.00**	**Driller Company**	**:**	**Client**	**: Billbergia Pty Ltd**		
Elevation	**: Not Surveyed**	**Logged By**	**: TG**	**Project**	**: Detailed Site Investigation and Geotechnical Assessment**		
Total Depth	**: 0.3 m**	**Date**	**: 29/07/2024**	**Location**	**: Llewellyn Street, Rhodes NSW**		

Drilling Method	Depth (m)	Samples: Discrete	PID (ppm): PID	Soil Origin	Graphic Log	Moisture	Material Description	Comments	Water
Hand Auger		BH13_0.1	0.8	Fill		SLM-D	Fill. Sandy CLAY. CL-CI: low to medium plasticity, soft to firm, dark brown, fine to coarse grained sand, inorganic, slightly moist to dry, increased clay content with depth.	increased clay content with depth	
		BH13_0.25	0.9	Reworked Natural			Reworked natural. CLAY. CL-CI: soft to firm, low to medium plasticity, dark brown, inorganic, slightly moist to dry, anthropogenic material including terracotta fragments present..	Anthropogenic material including terracotta fragments present.	
							BH13 Terminated at 0.3m		

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Boring No.: BH14

Easting	**: 0.00**	**Drill Supplier**	**:**	**Job Number**	**: 24109**	**Sheet**	**: 1 OF 1**
Northing	**: 0.00**	**Driller Company**	**:**	**Client**	**: Billbergia Pty Ltd**		
Elevation	**: Not Surveyed**	**Logged By**	**: TG**	**Project**	**: Detailed Site Investigation and Geotechnical Assessment**		
Total Depth	**: 0.17 m**	**Date**	**: 29/07/2024**	**Location**	**: Llewellyn Street, Rhodes NSW**		

Drilling Method	Depth (m)	Samples: Discrete	PID (ppm): PID	Soil Origin	Graphic Log	Moisture	Material Description	Comments	Water
Hand Auger				grass			Grass.		
		BH14_0.1	0.8	Fill		SLM-D	Fill. Sandy CLAY. CL-CI: low to medium plasticity, soft to firm, dark brown, fine to coarse grained sand, inorganic, slightly moist to dry, no odour, anthropogenic material or staining..	No odour, anthropogenic material or staining.	
							BH14 refusal at 0.17m (tree roots)		

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Boring No.: BH16

Easting	**: 0.00**	**Drill Supplier**	**:**	**Job Number**	**: 24109**	**Sheet**	**: 1 OF 1**
Northing	**: 0.00**	**Driller Company**	**:**	**Client**	**: Billbergia Pty Ltd**		
Elevation	**: Not Surveyed**	**Logged By**	**: TW**	**Project**	**: Detailed Site Investigation and Geotechnical Assessment**		
Total Depth	**: 0.3 m**	**Date**	**: 29/07/2024**	**Location**	**: Llewellyn Street, Rhodes NSW**		

Drilling Method	Depth (m)	Samples: Discrete	PID (ppm): PID	Soil Origin	Graphic Log	Moisture	Material Description	Comments	Water
Hand Auger				grass			Grass.		
				Fill		W-M	Fill. SAND. SW: loose to medium dense, pale yellow, fine to medium grained, wet to moist, no odour, anthropogenic material or staining..	No odour, anthropogenic material or staining.	
		BH16_0.1	0.7			SLM-D	Fill. Clayey SAND. SC: medium plasticity clay, loose to medium dense, dark brown, fine to medium grained, slightly moist to dry, no odour, anthropogenic material or staining..	No odour, anthropogenic material or staining.	
				Natural			Natural. CLAY. CL-CI: soft to firm, low to medium plasticity, dark brown, inorganic, slightly moist to dry.		
		BH16_0.3	0.8						
							BH16 Terminated at 0.3m		

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Boring No.: BH15

Easting	: 0.00	**Drill Supplier**	:	**Job Number**	: 24109	**Sheet**	: 1 OF 1
Northing	: 0.00	**Driller Company**	:	**Client**	: Billbergia Pty Ltd		
Elevation	: Not Surveyed	**Logged By**	: TW	**Project**	: Detailed Site Investigation and Geotechnical Assessment		
Total Depth	: 0.15 m	**Date**	: 08/08/2024	**Location**	: Llewellyn Street, Rhodes NSW		

Drilling Method	Depth (m)	Samples	PID (ppm)	Soil Origin	Graphic Log	Moisture	Material Description	Comments	Water
		Discrete	PID						
Hand Auger				grass			Grass. grass and topsoil.		
		BH15_0.1	0.7	Fill		D	Fill. Sandy SILT. ML: low plasticity, soft to firm, dark brown, fine to coarse grained sand, with coarse sized gravel, trace low plasticity clay, inorganic, dry, no odour, anthropogenic material or staining. some trace clays from 0.1..	No odour, anthropogenic material or staining. Some trace clays from 0.1.	
							BH15 refusal at 0.15m (Tree Root)		

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Boring No.: BH17

Easting	**: 0.00**	**Drill Supplier**	**:**	**Job Number**	**: 24109**	**Sheet**	**: 1 OF 1**
Northing	**: 0.00**	**Driller Company**	**:**	**Client**	**: Billbergia Pty Ltd**		
Elevation	**: Not Surveyed**	**Logged By**	**: TW**	**Project**	**: Detailed Site Investigation and Geotechnical Assessment**		
Total Depth	**: 0.2 m**	**Date**	**: 08/08/2024**	**Location**	**: Llewellyn Street, Rhodes NSW**		

Drilling Method	Depth (m)	Samples: Discrete	PID (ppm): PID	Soil Origin	Graphic Log	Moisture	Material Description	Comments	Water
Hand Auger				grass			Grass. grass and topsoil.		
		BH17_0.1	1.1	Fill		D	Fill. Sandy SILT. ML: low plasticity, soft to firm, dark brown, fine to coarse grained sand, with coarse sized gravel, inorganic, dry, no odour, anthropogenic material or staining..	No odour, anthropogenic material or staining.	
							BH17 refusal at 0.2m (Tree Root)		

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Boring No.: BH18

Easting	**: 0.00**	**Drill Supplier**	**:**	**Job Number**	**: 24109**	**Sheet**	**: 1 OF 1**
Northing	**: 0.00**	**Driller Company**	**:**	**Client**	**: Billbergia Pty Ltd**		
Elevation	**: Not Surveyed**	**Logged By**	**: TW**	**Project**	**: Detailed Site Investigation and Geotechnical Assessment**		
Total Depth	**: 0.25 m**	**Date**	**: 08/08/2024**	**Location**	**: Llewellyn Street, Rhodes NSW**		

Drilling Method	Depth (m)	Samples: Discrete	PID (ppm): PID	Soil Origin	Graphic Log	Moisture	Material Description	Comments	Water
Hand Auger				grass			Grass. grass.		
		BH18_0.1	1.0	Fill		D	Fill. Sandy SILT. ML: low plasticity, soft to firm, dark brown, fine grained sand, trace fine to medium sized gravel, trace low plasticity clay, inorganic, dry, no odour, anthropogenic material or staining. some trace clays increasing with depth.	No odour, anthropogenic material or staining. Some trace clays increasing with depth	
		BH18_0.25	1.1	Natural		SLM	Natural. Silty CLAY. CI: soft to firm, medium plasticity, dark brown, inorganic, slightly moist, no odour, anthropogenic material or staining. some terracotta-coloured rocks/claystone from 0.25m..	No odour, anthropogenic material or staining. Some terracotta-coloured rocks/claystone from 0.25m.	
							BH18 Terminated at 0.25m		

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Boring No.: BH19

Easting	: 0.00	**Drill Supplier**	:	**Job Number**	: 24109	**Sheet**	: 1 OF 1
Northing	: 0.00	**Driller Company**	:	**Client**	: Billbergia Pty Ltd		
Elevation	: Not Surveyed	**Logged By**	: TW	**Project**	: Detailed Site Investigation and Geotechnical Assessment		
Total Depth	: 0.1 m	**Date**	: 08/08/2024	**Location**	: Llewellyn Street, Rhodes NSW		

Drilling Method	Depth (m)	Samples	PID (ppm)	Soil Origin	Graphic Log	Moisture	Material Description	Comments	Water
		Discrete	PID						
Hand Auger				grass			Grass. grass with trace gravels.		
				Fill		D	Fill. Clayey to silty GRAVEL. GC: low plasticity clay, medium dense, dark brown, medium to coarse sized, dry, no odour, anthropogenic material or staining..	No odour, anthropogenic material or staining.	
		BH19_0.1	0.8						
							BH19 refusal at 0.1m (Large Gravels)		

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Boring No.: BH20

Easting	**: 0.00**	**Drill Supplier**	**:**	**Job Number**	**: 24109**	**Sheet**	**: 1 OF 1**
Northing	**: 0.00**	**Driller Company**	**:**	**Client**	**: Billbergia Pty Ltd**		
Elevation	**: Not Surveyed**	**Logged By**	**: TW**	**Project**	**: Detailed Site Investigation and Geotechnical Assessment**		
Total Depth	**: 0.25 m**	**Date**	**: 08/08/2024**	**Location**	**: Llewellyn Street, Rhodes NSW**		

Drilling Method	Depth (m)	Samples: Discrete	PID (ppm): PID	Soil Origin	Graphic Log	Moisture	Material Description	Comments	Water
Hand Auger				grass			Grass. grass.		
		BH20_0.05	0.8	Fill		D	Fill. Sandy SILT. ML: low plasticity, soft to firm, dark brown, fine to medium grained sand, trace fine to medium sized gravel, trace low plasticity clay, inorganic, dry, no odour, anthropogenic material or staining..	No odour, anthropogenic material or staining.	
		BH20_0.25	0.9	Natural		SLM-D	Natural. CLAY. CH: soft to firm, high plasticity, orange with red mottled, inorganic, slightly moist to dry, no odour, anthropogenic material or staining..	No odour, anthropogenic material or staining.	
							BH20 Terminated at 0.25m		

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Phone: (02) 9521 6567

Boring No.: BH21

Easting	: 0.00	**Drill Supplier**	:	**Job Number**	: 24109	**Sheet**	: 1 OF 1
Northing	: 0.00	**Driller Company**	:	**Client**	: Billbergia Pty Ltd		
Elevation	: Not Surveyed	**Logged By**	: TW	**Project**	: Detailed Site Investigation and Geotechnical Assessment		
Total Depth	: 0.3 m	**Date**	: 08/08/2024	**Location**	: Llewellyn Street, Rhodes NSW		

Drilling Method	Depth (m)	Samples: Discrete	PID (ppm): PID	Soil Origin	Graphic Log	Moisture	Material Description	Comments	Water
Hand Auger				grass			Grass.		
		BH21_0.2	1.0	Natural		SLM	Natural. CLAY. CI-CH: soft to firm, medium to high plasticity, dark brown, inorganic, slightly moist, no odour, anthropogenic material or staining. trace silt..	No odour, anthropogenic material or staining. Trace Silt.	
							BH21 Terminated at 0.3m		

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Phone: (02) 9521 6567

Boring No.: BH22

Easting	**: 0.00**	**Drill Supplier**	**:**	**Job Number**	**: 24109**	**Sheet**	**: 1 OF 1**
Northing	**: 0.00**	**Driller Company**	**:**	**Client**	**: Billbergia Pty Ltd**		
Elevation	**: Not Surveyed**	**Logged By**	**: TW**	**Project**	**: Detailed Site Investigation and Geotechnical Assessment**		
Total Depth	**: 0.25 m**	**Date**	**: 08/08/2024**	**Location**	**: Llewellyn Street, Rhodes NSW**		

Drilling Method	Depth (m)	Samples: Discrete	PID (ppm): PID	Soil Origin	Graphic Log	Moisture	Material Description	Comments	Water
Hand Auger				grass			Grass.		
				Fill		D	Fill. Gravelly SILT. GM: low to medium plasticity, soft to firm, dark brown, fine to coarse sized gravel, inorganic, dry, topsoil with large gravels present..	Topsoil with large gravels present.	
		BH22_0.1	1.2	Natural		SLM	Natural. Silty CLAY. CI-CH: soft to firm, medium to high plasticity, dark brown, inorganic, slightly moist, no odour, anthropogenic material or staining. increasing clay content with depth..	No odour, anthropogenic material or staining. Increasing clay content with depth.	
		BH22_0.25	1.3						
							BH22 refusal at 0.25m (Refusal on large sandstone gravels)		

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Phone: (02) 9521 6567

Boring No.: BH23

Easting	: 0.00	**Drill Supplier**	:	**Job Number**	: 24109	**Sheet**	: 1 OF 1
Northing	: 0.00	**Driller Company**	:	**Client**	: Billbergia Pty Ltd		
Elevation	: Not Surveyed	**Logged By**	: TW	**Project**	: Detailed Site Investigation and Geotechnical Assessment		
Total Depth	: 0.2 m	**Date**	: 08/08/2024	**Location**	: Llewellyn Street, Rhodes NSW		

Drilling Method	Depth (m)	Samples: Discrete	PID (ppm): PID	Soil Origin	Graphic Log	Moisture	Material Description	Comments	Water
Hand Auger				grass			Grass.		
				Fill		D	Fill. Gravelly SILT. GM: low to medium plasticity, soft to firm, dark brown, fine to coarse sized gravel, inorganic, dry, topsoil with large gravels present..	Topsoil with large gravels present.	
		BH23_0.15	0.7	Natural		SLM	Natural. Silty CLAY. CI-CH: soft to firm, medium to high plasticity, dark brown, inorganic, slightly moist, no odour, anthropogenic material or staining. increasing clay content with depth..	No odour, anthropogenic material or staining. Increasing clay content with depth.	
							BH23 refusal at 0.2m (Refusal on old pipe)		

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Phone: (02) 9521 6567

Boring No.: BH24

Easting	: 0.00	**Drill Supplier**	:	**Job Number**	: 24109
Northing	: 0.00	**Driller Company**	:	**Client**	: Billbergia Pty Ltd
Elevation	: Not Surveyed	**Logged By**	: TW	**Project**	: Detailed Site Investigation and Geotechnical Assessment
Total Depth	: 0.22 m	**Date**	: 08/08/2024	**Location**	: Llewellyn Street, Rhodes NSW

Sheet : 1 OF 1

Drilling Method	Depth (m)	Samples			PID (ppm)	Soil Origin	Graphic Log	Moisture	Material Description	Comments	Water
		Discrete	Trip	Dup	PID						
Hand Auger						grass			Grass.		
		BH24_0.1	TRIP02	DUP02	0.8	Fill		D	Fill. Clayey to silty SAND. SC: medium plasticity clay, medium dense, dark brown, medium grained, trace medium to coarse sized gravel, dry, increasing clay content from 0.15m.	Increasing clay content from 0.15m	
						Natural		SLM	Natural. Silty CLAY. CI-CH: soft to firm, medium to high plasticity, dark brown, inorganic, slightly moist, no odour, anthropogenic material or staining..	No odour, anthropogenic material or staining.	
									BH24 refusal at 0.22m		

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Phone: (02) 9521 6567

Boring No.: BH25

Easting	**: 0.00**	**Drill Supplier**	**:**	**Job Number**	**: 24109**	**Sheet**	**: 1 OF 1**
Northing	**: 0.00**	**Driller Company**	**:**	**Client**	**: Billbergia Pty Ltd**		
Elevation	**: Not Surveyed**	**Logged By**	**: TW**	**Project**	**: Detailed Site Investigation and Geotechnical Assessment**		
Total Depth	**: 0.25 m**	**Date**	**: 08/08/2024**	**Location**	**: Llewellyn Street, Rhodes NSW**		

Drilling Method	Depth (m)	Samples: Discrete	PID (ppm): PID	Soil Origin	Graphic Log	Moisture	Material Description	Comments	Water
Hand Auger				grass			Grass.		
				Fill		D	Fill. Clayey to silty SAND. SC: medium plasticity clay, medium dense, dark brown, medium grained, trace medium to coarse sized gravel, dry, increasing clay content from 0.15m.	Increasing clay content from 0.15m	
				Natural		SLM	Natural. Silty CLAY. CI-CH: soft to firm, medium to high plasticity, dark brown, inorganic, slightly moist, no odour, anthropogenic material or staining. some sandstone gravels from 0.25m..	No odour, anthropogenic material or staining. Some sandstone gravels from 0.25m.	
		BH25_0.25	0.8						
							BH25 refusal at 0.25m (Sandstone Gravels)		

E

Results Tables

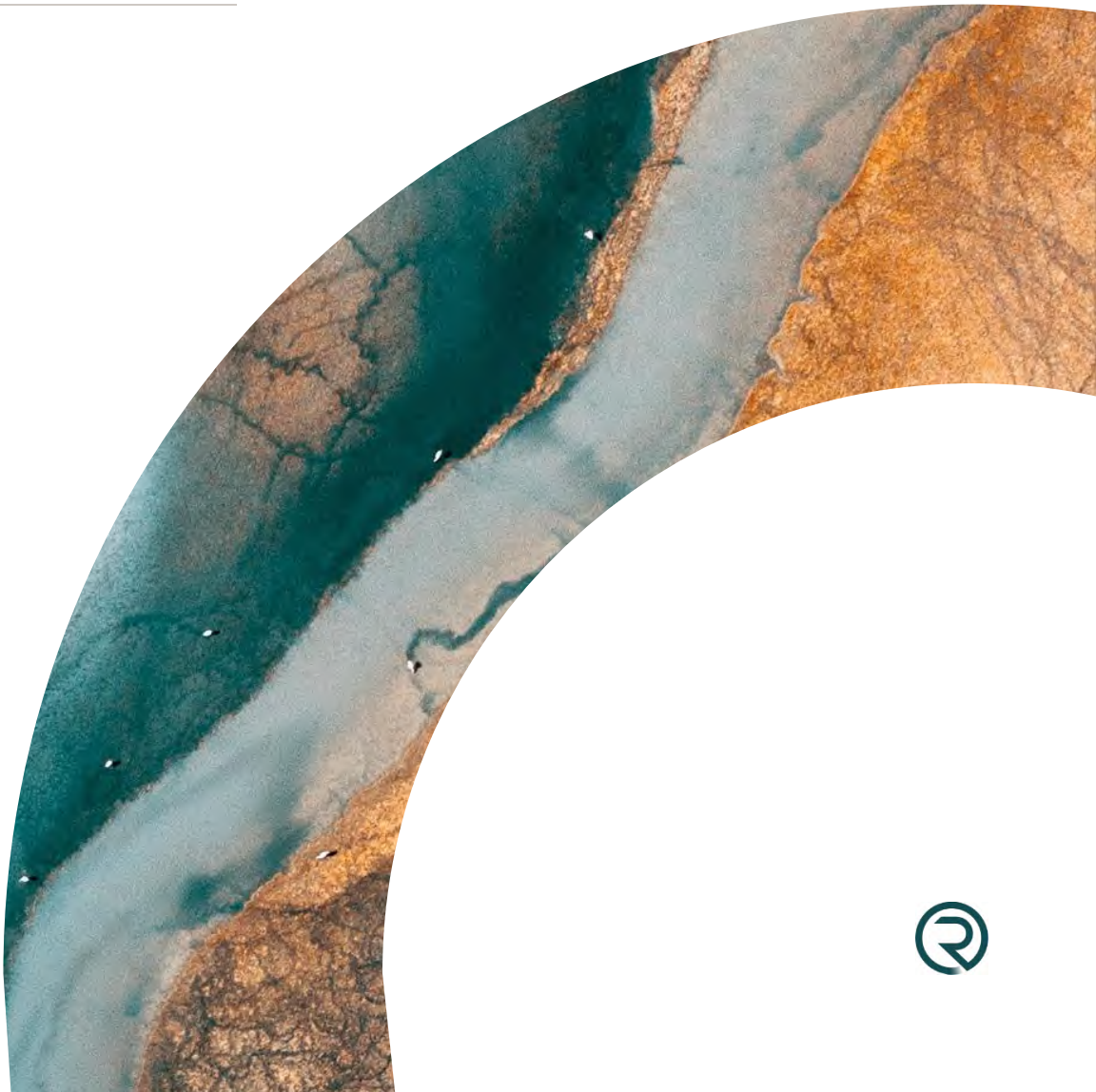


Table 1
Soil Analytical Results Summary

REDITUS

				Asbestos				BTEX						
					Asbestos (ACM >7mm) Estimation	Total Asbestos	Asbestos fibres	Naphthalene (BTEX)	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene Total
				%w/w	%w/w	g/kg	Detect	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL								1	0.2	0.5	1	2	1	1
NEPM 2013 Table 1A(1) HILs Res B Soil														
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand >=0m, <1m							ND	**3**	**0.5**	**160**	**55**			**40**
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space								**170**						
NEPM 2013 Table 1B(6) ESLs for Comm & Industrial, Coarse Soil									**50**	**85**	**70**			**105**
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil														
Field ID	**Date**	**Depth**	**Matrix Type**											
BH01_0.1	**29 Jul 2024**	**0.1**	**Soil**	-	-	-	*ND*	<1	<0.2	<0.5	<1	<2	<1	<1
BH02_0.25	**29 Jul 2024**	**0.25**	**Soil**	-	-	-	-	<1	<0.2	<0.5	<1	<2	<1	<1
BH03_0.3	**29 Jul 2024**	**0.3**	**Soil**	-	-	-	-	<1	<0.2	<0.5	<1	<2	<1	<1
BH04_0.15	**29 Jul 2024**	**0.15**	**Soil**	-	-	-	*ND*	<1	<0.2	<0.5	<1	<2	<1	<1
BH05_0.1	**29 Jul 2024**	**0.1**	**Soil**	-	-	-	*ND*	<1	<0.2	<0.5	<1	<2	<1	<1
BH06_0.3	**29 Jul 2024**	**0.3**	**Soil**	-	-	-	-	<1	<0.2	<0.5	<1	<2	<1	<1
BH07_0.1	**29 Jul 2024**	**0.1**	**Soil**	-	-	-	*ND*	<1	<0.2	<0.5	<1	<2	<1	<1
BH08_0.1	**29 Jul 2024**	**0.1**	**Soil**	-	-	-	*ND*	<1	<0.2	<0.5	<1	<2	<1	<1
BH09_0.3	**29 Jul 2024**	**0.3**	**Soil**	-	-	-	-	<1	<0.2	<0.5	<1	<2	<1	<1
BH10_0.1	**29 Jul 2024**	**0.1**	**Soil**	-	-	-	*ND*	<1	<0.2	<0.5	<1	<2	<1	<1
BH11_0.2	**29 Jul 2024**	**0.2**	**Soil**	-	-	-	*ND*	<1	<0.2	<0.5	<1	<2	<1	<1
BH12_0.15	**29 Jul 2024**	**0.15**	**Soil**	-	-	-	*ND*	<1	<0.2	<0.5	<1	<2	<1	<1
BH13_0.25	**29 Jul 2024**	**0.25**	**Soil**	-	-	-	*ND*	<1	<0.2	<0.5	<1	<2	<1	<1
BH14_0.1	**29 Jul 2024**	**0.1**	**Soil**	-	-	-	*ND*	<1	<0.2	<0.5	<1	<2	<1	<1
BH15_0.1	**08 Aug 2024**	**0.1**	**Soil**	<0.001	<0.01	<0.1	*ND*	<1	<0.2	<0.5	<1	<2	<1	<1
BH16_0.3	**29 Jul 2024**	**0.3**	**Soil**	-	-	-	-	<1	<0.2	<0.5	<1	<2	<1	<1
BH17_0.1	**08 Aug 2024**	**0.1**	**Soil**	<0.001	<0.01	<0.1	*ND*	<1	<0.2	<0.5	<1	<2	<1	<1
BH18_0.25	**08 Aug 2024**	**0.25**	**Soil**	-	-	-	-	<1	<0.2	<0.5	<1	<2	<1	<1
BH19_0.1	**08 Aug 2024**	**0.1**	**Soil**	<0.001	<0.01	<0.1	*ND*	<1	<0.2	<0.5	<1	<2	<1	<1
BH20_0.2	**08 Aug 2024**	**0.2**	**Soil**	-	-	-	-	<1	<0.2	<0.5	<1	<2	<1	<1
BH21_0.2	**08 Aug 2024**	**0.2**	**Soil**	<0.001	<0.01	<0.1	*ND*	<1	<0.2	<0.5	<1	<2	<1	<1
BH22_0.25	**08 Aug 2024**	**0.25**	**Soil**	<0.001	<0.01	<0.1	*ND*	<1	<0.2	<0.5	<1	<2	<1	<1
BH23_0.15	**08 Aug 2024**	**0.15**	**Soil**	<0.001	<0.01	<0.1	*ND*	<1	<0.2	<0.5	<1	<2	<1	<1
BH24_0.1	**08 Aug 2024**	**0.1**	**Soil**	<0.001	<0.01	<0.1	*ND*	<1	<0.2	<0.5	<1	<2	<1	<1
BH25_0.25	**08 Aug 2024**	**0.25**	**Soil**	-	-	-	-	<1	<0.2	<0.5	<1	<2	<1	<1

ND = non-detect

Environmental Standards
2013, NEPM 2013 Table 1A(1) HILs Res B Soil
2013, NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand
2013, NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil
NEPM, NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil

Table 1
Soil Analytical Results Summary

REDITUS

				TRH							TPH				
				C6-C10 Fraction (F1)	C6-C10 (F1 minus BTEX)	>C10-C16 Fraction (F2)	>C10-C16 Fraction (F2 minus Naphthalene)	>C16-C34 Fraction (F3)	>C34-C40 Fraction (F4)	>C10-C40 Fraction (Sum)	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 Fraction (Sum)
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				25	25	50	50	100	100	50	25	50	100	100	50
NEPM 2013 Table 1A(1) HILs Res B Soil															
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand >=0m, <1m					**45**		**110**								
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space															
NEPM 2013 Table 1B(6) ESLs for Comm & Industrial, Coarse Soil					**180**	**120**	**120**	**300**	**2,800**						
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil				**700**		**1,000**		**2,500**	**10,000**						
Field ID	**Date**	**Depth**	**Matrix Type**												
BH01_0.1	**29 Jul 2024**	**0.1**	**Soil**	<25	<25	<50	<50	**120**	<100	**120**	<25	<50	<100	<100	<50
BH02_0.25	**29 Jul 2024**	**0.25**	**Soil**	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
BH03_0.3	**29 Jul 2024**	**0.3**	**Soil**	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
BH04_0.15	**29 Jul 2024**	**0.15**	**Soil**	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
BH05_0.1	**29 Jul 2024**	**0.1**	**Soil**	<25	<25	<50	<50	**340**	**100**	**440**	<25	<50	**210**	**170**	**380**
BH06_0.3	**29 Jul 2024**	**0.3**	**Soil**	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
BH07_0.1	**29 Jul 2024**	**0.1**	**Soil**	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
BH08_0.1	**29 Jul 2024**	**0.1**	**Soil**	<25	<25	<50	<50	**120**	<100	**120**	<25	<50	<100	<100	<50
BH09_0.3	**29 Jul 2024**	**0.3**	**Soil**	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
BH10_0.1	**29 Jul 2024**	**0.1**	**Soil**	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
BH11_0.2	**29 Jul 2024**	**0.2**	**Soil**	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
BH12_0.15	**29 Jul 2024**	**0.15**	**Soil**	<25	<25	<50	<50	**180**	<100	**180**	<25	<50	**120**	<100	**120**
BH13_0.25	**29 Jul 2024**	**0.25**	**Soil**	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
BH14_0.1	**29 Jul 2024**	**0.1**	**Soil**	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
BH15_0.1	**08 Aug 2024**	**0.1**	**Soil**	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
BH16_0.3	**29 Jul 2024**	**0.3**	**Soil**	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
BH17_0.1	**08 Aug 2024**	**0.1**	**Soil**	<25	<25	<50	<50	**140**	<100	**140**	<25	<50	<100	**120**	**120**
BH18_0.25	**08 Aug 2024**	**0.25**	**Soil**	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
BH19_0.1	**08 Aug 2024**	**0.1**	**Soil**	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
BH20_0.2	**08 Aug 2024**	**0.2**	**Soil**	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
BH21_0.2	**08 Aug 2024**	**0.2**	**Soil**	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
BH22_0.25	**08 Aug 2024**	**0.25**	**Soil**	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
BH23_0.15	**08 Aug 2024**	**0.15**	**Soil**	<25	<25	<50	<50	**240**	**240**	**480**	<25	<50	**110**	**190**	**300**
BH24_0.1	**08 Aug 2024**	**0.1**	**Soil**	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
BH25_0.25	**08 Aug 2024**	**0.25**	**Soil**	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50

ND = non-detect

Environmental Standards
2013, NEPM 2013 Table 1A(1) HILs Res B Soil
2013, NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand
2013, NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil
NEPM, NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil

Table 1
Soil Analytical Results Summary

REDITUS

				PAH																	Inorganics					
				Benzo(b+j+k)fluoranthene	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	Benzo(a)pyrene TEQ calc (Half)	Benzo(a)pyrene TEQ (LOR)	PAHs (Sum of positives)	Exchangeable Calcium	pH 1:5 soil:water	Exchangeable Magnesium	Exchangeable Potassium	Exchangeable Sodium	Cation Exchange Capacity
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	meq/100g	-	meq/100g	meq/100g	meq/100g	meq/100g
EQL				0.2	0.1	0.1	0.1	0.1	0.05	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.5	0.05	0.1		0.1	0.1	0.1	1
NEPM 2013 Table 1A(1) HILs Res B Soil																			**4**	**4**	**400**						
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand >=0m, <1m																**3**											
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space																**170**											
NEPM 2013 Table 1B(6) ESLs for Comm & Industrial, Coarse Soil									**1.4 ****																		
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																											
Field ID	**Date**	**Depth**	**Matrix Type**																								
BH01_0.1	**29 Jul 2024**	**0.1**	**Soil**	**0.9**	<0.1	<0.1	<0.1	**0.5**	**0.58**	**0.5**	**0.4**	<0.1	**0.6**	<0.1	**0.3**	<0.1	**0.1**	**0.7**	**0.8**	**0.9**	**4.6**	-	-	-	-	-	-
BH02_0.25	**29 Jul 2024**	**0.25**	**Soil**	**0.5**	<0.1	<0.1	<0.1	**0.2**	**0.3**	**0.2**	**0.3**	<0.1	**0.3**	<0.1	**0.2**	<0.1	**0.1**	**0.4**	<0.5	**0.5**	**2.6**	-	-	-	-	-	-
BH03_0.3	**29 Jul 2024**	**0.3**	**Soil**	<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.05	-	-	-	-	-	-
BH04_0.15	**29 Jul 2024**	**0.15**	**Soil**	<0.2	<0.1	<0.1	<0.1	<0.1	**0.05**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	**0.05**	-	-	-	-	-	-
BH05_0.1	**29 Jul 2024**	**0.1**	**Soil**	**3.8**	<0.1	**0.3**	**0.4**	**2.3**	**2.4**	**1.8**	**1.7**	**0.3**	**3.2**	<0.1	**1.1**	<0.1	**0.8**	**3.7**	**3.5**	**3.5**	**22**	-	-	-	-	-	-
BH06_0.3	**29 Jul 2024**	**0.3**	**Soil**	<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.05	-	-	-	-	-	-
BH07_0.1	**29 Jul 2024**	**0.1**	**Soil**	<0.2	<0.1	<0.1	<0.1	<0.1	**0.06**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	**0.06**	-	-	-	-	-	-
BH08_0.1	**29 Jul 2024**	**0.1**	**Soil**	<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.05	-	-	-	-	-	-
BH09_0.3	**29 Jul 2024**	**0.3**	**Soil**	<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	**0.2**	<0.5	<0.5	**0.72**	-	-	-	-	-	-
BH10_0.1	**29 Jul 2024**	**0.1**	**Soil**	**0.7**	<0.1	<0.1	<0.1	**0.4**	**0.4**	**0.3**	**0.3**	<0.1	**0.6**	<0.1	**0.2**	<0.1	**0.1**	**0.7**	**0.6**	**0.7**	**3.8**	-	-	-	-	-	-
BH11_0.2	**29 Jul 2024**	**0.2**	**Soil**	<0.2	<0.1	<0.1	<0.1	<0.1	**0.05**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**0.1**	<0.5	<0.5	**0.2**	-	-	-	-	-	-
BH12_0.15	**29 Jul 2024**	**0.15**	**Soil**	**2**	<0.1	<0.1	<0.1	**1**	**1.2**	**0.9**	**0.8**	**0.1**	**1.4**	<0.1	**0.6**	<0.1	**0.3**	**1.6**	**1.7**	**1.7**	**9.7**	-	-	-	-	-	-
BH13_0.25	**29 Jul 2024**	**0.25**	**Soil**	<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.05	-	-	-	-	-	-
BH14_0.1	**29 Jul 2024**	**0.1**	**Soil**	**0.2**	<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	**0.2**	<0.5	<0.5	**0.89**	-	-	-	-	-	-
BH15_0.1	**08 Aug 2024**	**0.1**	**Soil**	<0.2	<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	**0.1**	<0.5	<0.5	**0.54**	-	-	-	-	-	-
BH16_0.3	**29 Jul 2024**	**0.3**	**Soil**	<0.2	<0.1	<0.1	<0.1	**0.1**	**0.08**	<0.1	**0.1**	<0.1	**0.2**	<0.1	<0.1	<0.1	<0.1	**0.2**	<0.5	<0.5	**0.66**	-	-	-	-	-	-
BH17_0.1	**08 Aug 2024**	**0.1**	**Soil**	**0.2**	<0.1	<0.1	<0.1	<0.1	**0.2**	**0.1**	**0.1**	<0.1	**0.2**	<0.1	**0.1**	<0.1	<0.1	**0.1**	<0.5	<0.5	**1.0**	-	-	-	-	-	-
BH18_0.25	**08 Aug 2024**	**0.25**	**Soil**	<0.2	<0.1	<0.1	<0.1	<0.1	**0.08**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	**0.08**	-	-	-	-	-	-
BH19_0.1	**08 Aug 2024**	**0.1**	**Soil**	<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.05	**31**	**7.8**	**1.8**	**1.1**	<0.1	**33**
BH20_0.2	**08 Aug 2024**	**0.2**	**Soil**	<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.05	**7.5**	**7.9**	**0.7**	**0.2**	<0.1	**8.4**
BH21_0.2	**08 Aug 2024**	**0.2**	**Soil**	**0.6**	<0.1	<0.1	<0.1	**0.4**	**0.4**	**0.2**	**0.3**	<0.1	**0.4**	<0.1	**0.2**	<0.1	**0.1**	**0.5**	**0.5**	**0.6**	**3.1**	-	-	-	-	-	-
BH22_0.25	**08 Aug 2024**	**0.25**	**Soil**	<0.2	<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	**0.1**	<0.5	<0.5	**0.4**	-	-	-	-	-	-
BH23_0.15	**08 Aug 2024**	**0.15**	**Soil**	<0.2	<0.1	<0.1	<0.1	<0.1	**0.07**	<0.1	<0.1	<0.1	**0.1**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	**0.2**	-	-	-	-	-	-
BH24_0.1	**08 Aug 2024**	**0.1**	**Soil**	**0.3**	<0.1	<0.1	<0.1	**0.2**	**0.2**	**0.1**	**0.2**	<0.1	**0.3**	<0.1	<0.1	<0.1	**0.2**	**0.3**	<0.5	<0.5	**1.7**	-	-	-	-	-	-
BH25_0.25	**08 Aug 2024**	**0.25**	**Soil**	<0.2	<0.1	<0.1	<0.1	<0.1	**0.07**	<0.1	<0.1	<0.1	**0.1**	<0.1	<0.1	<0.1	<0.1	**0.1**	<0.5	<0.5	**0.3**	-	-	-	-	-	-

ND = non-detect

Environmental Standards
2013, NEPM 2013 Table 1A(1) HILs Res B Soil
2013, NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand
2013, NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil
NEPM, NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil

Table 1
Soil Analytical Results Summary

				Metals							
				Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				4	0.4	1	1	1	0.1	1	1
NEPM 2013 Table 1A(1) HILs Res B Soil				500[#1]	150	500	30,000	1,200[#2]	120[#3]	1,200	60,000
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand >=0m, <1m											
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space				100[#9]		580	220	1,100		120	460
NEPM 2013 Table 1B(6) ESLs for Comm & Industrial, Coarse Soil											
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil											
Field ID	**Date**	**Depth**	**Matrix Type**								
BH01_0.1	29 Jul 2024	0.1	Soil	9	<0.4	18	41	110	0.1	9	82
BH02_0.25	29 Jul 2024	0.25	Soil	11	<0.4	37	57	170	0.2	16	170
BH03_0.3	29 Jul 2024	0.3	Soil	10	<0.4	30	17	28	0.2	11	34
BH04_0.15	29 Jul 2024	0.15	Soil	5	<0.4	12	26	33	<0.1	5	74
BH05_0.1	29 Jul 2024	0.1	Soil	8	2	35	280	470	0.2	13	270
BH06_0.3	29 Jul 2024	0.3	Soil	5	<0.4	14	22	31	<0.1	5	10
BH07_0.1	29 Jul 2024	0.1	Soil	<4	<0.4	6	8	33	<0.1	3	31
BH08_0.1	29 Jul 2024	0.1	Soil	7	<0.4	15	44	35	<0.1	9	130
BH09_0.3	29 Jul 2024	0.3	Soil	9	<0.4	19	34	72	<0.1	8	43
BH10_0.1	29 Jul 2024	0.1	Soil	6	<0.4	15	35	50	<0.1	10	51
BH11_0.2	29 Jul 2024	0.2	Soil	9	<0.4	16	23	52	<0.1	6	76
BH12_0.15	29 Jul 2024	0.15	Soil	9	<0.4	20	45	180	0.1	11	95
BH13_0.25	29 Jul 2024	0.25	Soil	11	<0.4	19	14	24	<0.1	5	85
BH14_0.1	29 Jul 2024	0.1	Soil	7	<0.4	18	27	970	<0.1	7	85
BH15_0.1	08 Aug 2024	0.1	Soil	8	<0.4	21	31	160	<0.1	4	200
BH16_0.3	29 Jul 2024	0.3	Soil	6	<0.4	16	18	62	<0.1	5	41
BH17_0.1	08 Aug 2024	0.1	Soil	15	<0.4	19	29	100	<0.1	7	94
BH18_0.25	08 Aug 2024	0.25	Soil	7	<0.4	24	18	80	<0.1	6	41
BH19_0.1	08 Aug 2024	0.1	Soil	21	<0.4	29	70	150	<0.1	13	160
BH20_0.2	08 Aug 2024	0.2	Soil	7	<0.4	20	23	93	<0.1	5	44
BH21_0.2	08 Aug 2024	0.2	Soil	9	3	43	430	410	0.2	17	480
BH22_0.25	08 Aug 2024	0.25	Soil	8	<0.4	21	35	60	<0.1	8	58
BH23_0.15	08 Aug 2024	0.15	Soil	5	<0.4	18	31	210	<0.1	8	140
BH24_0.1	08 Aug 2024	0.1	Soil	9	<0.4	27	69	200	<0.1	9	140
BH25_0.25	08 Aug 2024	0.25	Soil	-	-	-	-	-	-	-	-

ND = non-detect

Environmental Standards
2013, NEPM 2013 Table 1A(1) HILs Res B Soil
2013, NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand
2013, NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil
NEPM, NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil

Table 1
Soil Analytical Results Summary

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				Organochlorine Pesticides																					
				4,4-DDE	a-BHC	Aldrin	Dieldrin	Aldrin + Dieldrin	b-BHC	Chlordane (cis)	Chlordane (trans)	d-BHC	DDD	DDT	DDT+DDE+DDD	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor	Mirex
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
NEPM 2013 Table 1A(1) HILs Res B Soil								**10**		**90**					**600**				**20**			**10**		**15**	**500**	**20**
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand >=0m, <1m																										
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space														**180**												
NEPM 2013 Table 1B(6) ESLs for Comm & Industrial, Coarse Soil																										
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																										
Field ID	**Date**	**Depth**	**Matrix Type**																							
BH01_0.1	**29 Jul 2024**	**0.1**	**Soil**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH02_0.25	**29 Jul 2024**	**0.25**	**Soil**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03_0.3	**29 Jul 2024**	**0.3**	**Soil**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04_0.15	**29 Jul 2024**	**0.15**	**Soil**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH05_0.1	**29 Jul 2024**	**0.1**	**Soil**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH06_0.3	**29 Jul 2024**	**0.3**	**Soil**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH07_0.1	**29 Jul 2024**	**0.1**	**Soil**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH08_0.1	**29 Jul 2024**	**0.1**	**Soil**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH09_0.3	**29 Jul 2024**	**0.3**	**Soil**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH10_0.1	**29 Jul 2024**	**0.1**	**Soil**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH11_0.2	**29 Jul 2024**	**0.2**	**Soil**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH12_0.15	**29 Jul 2024**	**0.15**	**Soil**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH13_0.25	**29 Jul 2024**	**0.25**	**Soil**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH14_0.1	**29 Jul 2024**	**0.1**	**Soil**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH15_0.1	**08 Aug 2024**	**0.1**	**Soil**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH16_0.3	**29 Jul 2024**	**0.3**	**Soil**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH17_0.1	**08 Aug 2024**	**0.1**	**Soil**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH18_0.25	**08 Aug 2024**	**0.25**	**Soil**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH19_0.1	**08 Aug 2024**	**0.1**	**Soil**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH20_0.2	**08 Aug 2024**	**0.2**	**Soil**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH21_0.2	**08 Aug 2024**	**0.2**	**Soil**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH22_0.25	**08 Aug 2024**	**0.25**	**Soil**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH23_0.15	**08 Aug 2024**	**0.15**	**Soil**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH24_0.1	**08 Aug 2024**	**0.1**	**Soil**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH25_0.25	**08 Aug 2024**	**0.25**	**Soil**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

ND = non-detect

Environmental Standards
2013, NEPM 2013 Table 1A(1) HILs Res B Soil
2013, NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand
2013, NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil
NEPM, NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil

Table 1
Soil Analytical Results Summary

REDITUS

				Organophosphorous Pesticides																				
				Azinophos methyl	Bromophos-ethyl	Chlorpyrifos	Chlorpyrifos-methyl	Coumaphos	Diazinon	Dichlorvos	Dimethoate	Disulfoton	Ethion	Fenamiphos	Fenitrothion	Fenthion	Malathion	Methidathion	Methyl parathion	Mevinphos (Phosdrin)	Parathion	Phorate	Ronnel	Phosalone
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
NEPM 2013 Table 1A(1) HILs Res B Soil						340																		
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand >=0m, <1m																								
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space																								
NEPM 2013 Table 1B(6) ESLs for Comm & Industrial, Coarse Soil																								
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																								
Field ID	**Date**	**Depth**	**Matrix Type**																					
BH01_0.1	**29 Jul 2024**	**0.1**	**Soil**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH02_0.25	**29 Jul 2024**	**0.25**	**Soil**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03_0.3	**29 Jul 2024**	**0.3**	**Soil**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04_0.15	**29 Jul 2024**	**0.15**	**Soil**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH05_0.1	**29 Jul 2024**	**0.1**	**Soil**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH06_0.3	**29 Jul 2024**	**0.3**	**Soil**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH07_0.1	**29 Jul 2024**	**0.1**	**Soil**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH08_0.1	**29 Jul 2024**	**0.1**	**Soil**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH09_0.3	**29 Jul 2024**	**0.3**	**Soil**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH10_0.1	**29 Jul 2024**	**0.1**	**Soil**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH11_0.2	**29 Jul 2024**	**0.2**	**Soil**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH12_0.15	**29 Jul 2024**	**0.15**	**Soil**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH13_0.25	**29 Jul 2024**	**0.25**	**Soil**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH14_0.1	**29 Jul 2024**	**0.1**	**Soil**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH15_0.1	**08 Aug 2024**	**0.1**	**Soil**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH16_0.3	**29 Jul 2024**	**0.3**	**Soil**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH17_0.1	**08 Aug 2024**	**0.1**	**Soil**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH18_0.25	**08 Aug 2024**	**0.25**	**Soil**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH19_0.1	**08 Aug 2024**	**0.1**	**Soil**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH20_0.2	**08 Aug 2024**	**0.2**	**Soil**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH21_0.2	**08 Aug 2024**	**0.2**	**Soil**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH22_0.25	**08 Aug 2024**	**0.25**	**Soil**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH23_0.15	**08 Aug 2024**	**0.15**	**Soil**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH24_0.1	**08 Aug 2024**	**0.1**	**Soil**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH25_0.25	**08 Aug 2024**	**0.25**	**Soil**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

ND = non-detect

Environmental Standards
2013, NEPM 2013 Table 1A(1) HILs Res B Soil
2013, NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand
2013, NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil
NEPM, NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil

Table 2
Groundwater Analytical Results Summary

	BTEX						TRH						
	Naphthalene (VOC)	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	C6-C10 Fraction (F1)	C6-C10 (F1 minus BTEX)	>C10-C16 Fraction (F2)	>C10-C16 Fraction (F2 minus Naphthalene)	>C16-C34 Fraction (F3)	>C34-C40 Fraction (F4)	>C10-C40 Fraction (Sum)
	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL	0.001	1	1	1	2	1	10	10	50	50	100	100	50
ANZG Marine Water Toxicant DGVs LOSP 95% (July 2023)	**70**	**700**	**180**	**80**									
NEPM 2013 Table 1A(4) Res HSL A & B GW for Vapour Intrusion, Sand													
>=2m, <4m		**800**						**1,000**		**1,000**			
>=4m, <8m		**800**						**1,000**		**1,000**			
>=8m		**900**						**1,000**		**1,000**			
ADWG 2022 Health **		**10**	**8,000**	**3,000**									
Field ID	**Date**	**Matrix Type**											
MW01	**22 Aug 2024**	**Water**	<0.1	<1	<1	<1	<2	<1	11	11	<50	<50	<100	<100	<50
MW03	**22 Aug 2024**	**Water**	<0.1	<1	<1	<1	<2	<1	<10	<10	<50	<50	<100	<100	<50
MW04	**22 Aug 2024**	**Water**	<0.1	<1	<1	<1	<2	<1	15	15	<50	<50	<100	<100	<50
MW06	**22 Aug 2024**	**Water**	<0.1	<1	<1	<1	<2	<1	<10	<10	<50	<50	<100	<100	<50

* A Non Detect Multiplier of 0.5 has been applied.
** Drinking water guidline has been adjusted by a factor of 10 to adjust for reduced daily intake intake

Environmental Standards
ANZG, July 2023, ANZG Marine Water Toxicant DGVs LOSP 95% (July 2023)
2013, NEPM 2013 Table 1A(4) Res HSL A & B GW for Vapour Intrusion, Sand
NHMRC, May 2022, ADWG 2022 Health

Table 2
Groundwater Analytical Results Summary

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	TPH					PAH																
	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 Fraction (Sum)	Benzo(b+j+k)fluoranthene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a) pyrene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	Benzo(a)pyrene TEQ	PAHs (Sum of positives)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L
EQL	10	50	100	100	50	0.0002	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0005	0.0001
ANZG Marine Water Toxicant DGVs LOSP 95% (July 2023)									**0.4**		**0.2**				**1.4**			**70**	**2**			
NEPM 2013 Table 1A(4) Res HSL A & B GW for Vapour Intrusion, Sand																						
>=2m, <4m																						
>=4m, <8m																						
>=8m																						
ADWG 2022 Health **											**0.1**											
Field ID	**Date**	**Matrix Type**																				
MW01	**22 Aug 2024**	**Water**	<10	<50	<100	<100	<50	<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	<0.0005	<0.0001
MW03	**22 Aug 2024**	**Water**	<10	<50	<100	<100	<50	<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	<0.0005	<0.0001
MW04	**22 Aug 2024**	**Water**	12	<50	<100	<100	<50	<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	<0.0005	<0.0001
MW06	**22 Aug 2024**	**Water**	<10	<50	<100	<100	<50	<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	<0.0005	<0.0001

* A Non Detect Multiplier of 0.5 has been applied.
** Drinking water guidline has been adjusted by a factor of 10 to adjust for reduced daily intake intak

Environmental Standards
ANZG, July 2023, ANZG Marine Water Toxicant DGVs LOSP 95% (July 2023)
2013, NEPM 2013 Table 1A(4) Res HSL A & B GW for Vapour Intrusion, Sand
NHMRC, May 2022, ADWG 2022 Health

Table 2
Groundwater Analytical Results Summary

	Metals							
	Arsenic (filtered)	Cadmium (filtered)	Chromium (III+VI) (filtered)	Copper (filtered)	Lead (filtered)	Mercury (filtered)	Nickel (filtered)	Zinc (filtered)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL	0.001	0.0001	0.001	0.001	0.001	0.00005	0.001	0.001
ANZG Marine Water Toxicant DGVs LOSP 95% (July 2023)	**24**	**5.5**	**4.4**	**1.3**	**4.4**	**0.4**	**70**	**8**
NEPM 2013 Table 1A(4) Res HSL A & B GW for Vapour Intrusion, Sand								
>=2m, <4m								
>=4m, <8m								
>=8m								
ADWG 2022 Health **	**100**	**20**	**500**	**20,000**	**100**	**10**	**200**	
Field ID	**Date**	**Matrix Type**						
MW01	**22 Aug 2024**	**Water**	5	0.1	**11**	<1	1	<0.05	10	**23**
MW03	**22 Aug 2024**	**Water**	12	<0.1	<1	<1	<1	<0.05	24	4
MW04	**22 Aug 2024**	**Water**	<1	1.1	<1	<1	<1	<0.05	**180**	**560**
MW06	**22 Aug 2024**	**Water**	1	<0.1	<1	<1	<1	<0.05	50	**73**

* A Non Detect Multiplier of 0.5 has been applied.
** Drinking water guidline has been adjusted by a factor of 10 to adjust for reduced daily intake intak

Environmental Standards
ANZG, July 2023, ANZG Marine Water Toxicant DGVs LOSP 95% (July 2023)
2013, NEPM 2013 Table 1A(4) Res HSL A & B GW for Vapour Intrusion, Sand
NHMRC, May 2022, ADWG 2022 Health

Detailed Site Investigation
2A Llewellyn St, 43 – 57 Blaxland Rd and 2A, 2B and 2D Cavell Ave, Rhodes NSW
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Table 3
ASS Results Summary

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			Acid Sulphate Soils - Acid Base Accounting						Acid Sulphate Soils - Acidity Trail				Acid Sulphate Soils - ANC				Acid Sulphate Soils -		Acid Sulphate Soils - pH		Acid Sulphate Soils - Potential Acidity		
			a-Net Acidity without ANCE	s-Net Acidity without ANCE	Net Acidity (acidity units)		Net Acidity (sulfur units)	Net Acidity (sulfur units)	Titratable Actual Acidity (sulfur units)	Titratable Actual Acidity	Titratable Actual Acidity		Acid Neutralising Capacity		Acid Neutralising Capacity (sulfur units)	Acid Neutralising Capacity (sulfur units)	Liming Rate	Liming Rate excluding ANC	pHKCl	pHKCl	Chromium Reducible Sulphur (acidity units)		Chromium Reducible Sulfur
			moles H+/t	%w/w S	moles H+/t	mole H+/t	%w/w S	%S	%w/w S	%S	moles H+/t	mole H+/t	% CaCO3	%CaCO3	%w/w S	%S	kg CaCO3/t	kg CaCO3/t	pH units	-	moles H+/t	mole H+/t	%w/w
EQL			5	0.005	5	5	0.005	0.005	0.01	0.01	5	5	0.05	0.05	0.05	0.05	0.75	0.75			3	3	0.005
ASSMAC Acid Sulfate Soil Manual (1998) Table 4.4, 1000 tonnes disturbed, coarse soil texture			**18**	**0.03**																			
NASS Guidance (2018): National acid sulfate soils identification and laboratory methods manual																							**0.01**
Field ID	**Date**	**Depth**																					
GBH02_7.0	**09 Aug 2024**	**7**	**12**	**0.018**	<5	-	<0.005	-	<0.01	-	<5	-	**2.0**	-	**0.64**	-	<0.75	**0.86**	**7.7**	-	**12**	-	**0.02**
GBH02_9.0	**09 Aug 2024**	**9**	**8.0**	**0.013**	<5	-	<0.005	-	<0.01	-	<5	-	**4.0**	-	**1.3**	-	<0.75	<0.75	**8.3**	-	**8**	-	**0.01**
GBH02_12.0	**09 Aug 2024**	**12**	<5	<0.005	<5	-	<0.005	-	<0.01	-	<5	-	**3.2**	-	**1.0**	-	<0.75	<0.75	**8.4**	-	<3	-	<0.005
GBH4_5.0	**15 Aug 2024**	**5**	**8.8**	**0.014**	-	**8.8**	-	**0.014**	-	<0.01	-	<5	-	-	-	-	<0.75	<0.75	-	**5.9**	-	**8**	**0.01**
GBH4_10.0	**15 Aug 2024**	**10**	<5	**0.0080**	-	<5	-	<0.005	-	<0.01	-	<5	-	**4.7**	-	**1.5**	<0.75	<0.75	-	**7.9**	-	**5**	**0.008**
GBH4_15.0	**15 Aug 2024**	**15**	**26**	**0.041**	-	<5	-	<0.005	-	<0.01	-	<5	-	**9.8**	-	**3.1**	<0.75	**1.9**	-	**8.9**	-	**26**	**0.04**
GBH7_7.0	**13 Aug 2024**	**7**	**6.5**	**0.010**	**6.5**	-	**0.010**	-	<0.01	-	<5	-	-	-	-	-	<0.75	<0.75	**5.0**	-	<3	-	<0.005
GBH7_9.0	**13 Aug 2024**	**9**	**38**	**0.062**	**38**	-	**0.062**	-	<0.01	-	<5	-	-	-	-	-	**3**	**2.9**	**6.4**	-	**38**	-	**0.06**

Environmental Standards
NSW EPA, November 2014, NSW 2014 Excavated Natural Material (Absolute Max)
NSW EPA, November 2014, NSW 2014 Excavated Natural Material (Max Average)

Detailed Site Investigation
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Table 4
Soil - Field Duplicate Assessment

				BTEX								Asbestos					TRH							
				Naphthalene (BTEX)	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene Total	Total BTEX	Asbestos (<2mm AF/FA)		Asbestos (ACM >7mm) Estimation	Total Asbestos	Asbestos fibres	C6-C10 Fraction (F1)	C6-C10 (F1 minus BTEX)	>C10-C16 Fraction (F2)	>C10-C16 Fraction (F2 minus Naphthalene)	>C16-C34 Fraction (F3)	>C34-C40 Fraction (F4)	>C10-C40 Fraction (Sum)
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	g	%w/w	%w/w	g/kg	Detect	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				1	0.2	0.5	0.5	0.5	0.5	0.5	0.2						10	10	50	50	100	100	50
Lab Report Number	**Field ID**	**Matrix Type**	**Date**																				
357812	**BH10_0.1**	**Soil**	**29 Jul 2024**	<1	<0.2	<0.5	<1	<2	<1	<1						0	<25	<25	<50	<50	<100	<100	<50
357812	**DUP01**	**Soil**	**29 Jul 2024**	<1	<0.2	<0.5	<1	<2	<1	<1							<25	<25	<50	<50	170	<100	170
RPD				0	0	0	0	0	0	0							0	0	0	0	52	0	109
357812	**BH10_0.1**	**Soil**	**29 Jul 2024**	<1	<0.2	<0.5	<1	<2	<1	<1						0	<25	<25	<50	<50	<100	<100	<50
ES2425194	**TRIP01**	**Soil**	**29 Jul 2024**	<1	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2						<10	<10	<50	<50	<100	<100	<50
RPD				0	0	0	0	0	0	0							0	0	0	0	0	0	0
359034	**BH24_0.1**	**Soil**	**08 Aug 2024**	<1	<0.2	<0.5	<1	<2	<1	<1		0	<0.001	<0.01	<0.1	0	<25	<25	<50	<50	<100	<100	<50
359034	**DUP2**	**Soil**	**08 Aug 2024**	<1	<0.2	<0.5	<1	<2	<1	<1							<25	<25	<50	<50	<100	<100	<50
RPD				0	0	0	0	0	0	0							0	0	0	0	0	0	0
359034	**BH24_0.1**	**Soil**	**08 Aug 2024**	<1	<0.2	<0.5	<1	<2	<1	<1		0	<0.001	<0.01	<0.1	0	<25	<25	<50	<50	<100	<100	<50
ES2426839	**TRIP2**	**Soil**	**08 Aug 2024**	<1	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2						<10	<10	<50	<50	<100	<100	<50
RPD				0	0	0	0	0	0	0							0	0	0	0	0	0	0

***RPDs have only been considered where a concentration is greater than 1 times the EQL.**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 100 (0 - 5 x EQL); 75 (5 - 10 x EQL); 30 (> 10 x EQL))**
*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory**

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Table 4
Soil - Field Duplicate Assessment

				TPH					PAH																								
				C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 Fraction (Sum)	Benzo(b+j+k)fluoranthene	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(b+j)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	Benzo(a)pyrene TEQ calc (Half)	Benzo(a)pyrene TEQ (LOR)	PAHs (Sum of total)	PAHs (Sum of positives)	Arsenic	Cadmium
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				10	50	100	100	50	0.2	0.1	0.1	0.1	0.1	0.05	0.5	0.1	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.5	0.5	0.05	4	0.4
Lab Report Number	**Field ID**	**Matrix Type**	**Date**																														
357812	**BH10_0.1**	**Soil**	**29 Jul 2024**	<25	<50	<100	<100	<50	0.7	<0.1	<0.1	<0.1	0.4	0.4		0.3		0.3	<0.1	0.6	<0.1	0.2	<0.1	0.1	0.7	0.6	0.7		3.8	6	<0.4
357812	**DUP01**	**Soil**	**29 Jul 2024**	<25	<50	100	<100	100	2.2	<0.1	<0.1	0.1	1.2	1.4		1.0		1.0	0.2	1.9	<0.1	0.7	<0.1	0.4	2.0	2.0	2.0		12	12	0.7
RPD				0	0	0	0	67	103	0	0	0	100	111		103		103	67	104	0	111	0	120	95	105	96		104	67	55
357812	**BH10_0.1**	**Soil**	**29 Jul 2024**	<25	<50	<100	<100	<50	0.7	<0.1	<0.1	<0.1	0.4	0.4		0.3		0.3	<0.1	0.6	<0.1	0.2	<0.1	0.1	0.7	0.6	0.7		3.8	6	<0.4
ES2425194	**TRIP01**	**Soil**	**29 Jul 2024**	<10	<50	<100	<100	<50		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5		6	<1
RPD				0	0	0	0	0		0	0	0	0	0		0		0	0	18	0	0	0	0	33	0	53			0	0
359034	**BH24_0.1**	**Soil**	**08 Aug 2024**	<25	<50	<100	<100	<50	0.3	<0.1	<0.1	<0.1	0.2	0.2		0.1		0.2	<0.1	0.3	<0.1	<0.1	<0.1	0.2	0.3	<0.5	<0.5		1.7	9	<0.4
359034	**DUP2**	**Soil**	**08 Aug 2024**	<25	<50	<100	<100	<50	<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	<0.5	<0.5		0.3	10	<0.4
RPD				0	0	0	0	0	40	0	0	0	67	67		0		67	0	100	0	0	0	67	100	0	0		140	11	0
359034	**BH24_0.1**	**Soil**	**08 Aug 2024**	<25	<50	<100	<100	<50	0.3	<0.1	<0.1	<0.1	0.2	0.2		0.1		0.2	<0.1	0.3	<0.1	<0.1	<0.1	0.2	0.3	<0.5	<0.5		1.7	9	<0.4
ES2426839	**TRIP2**	**Soil**	**08 Aug 2024**	<10	<50	<100	<100	<50		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5		11	<1
RPD				0	0	0	0	0		0	0	0	0	0		0		0	0	0	0	0	0	0	0	18	82			20	0

***RPDs have only been considered where a concentration is greater than 1 times the EQL.**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier rang**
*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any**

Detailed Site Investigation
2A Llewellyn St, 43 – 57 Blaxland Rd and 2A, 2B and 2D Cavell Ave, Rhodes NSW
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Table 4
Soil - Field Duplicate Assessment

				Metals						Organochlorine Pesticides																				
				Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc	4,4-DDE	a-BHC	Aldrin	Dieldrin	Aldrin + Dieldrin	b-BHC	Chlordane	Chlordane (cis)	Chlordane (trans)	d-BHC	DDD	DDT	DDT+DDE+DDD	Endosulfan	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				1	1	1	0.1	1	1	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.1	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Lab Report Number	**Field ID**	**Matrix Type**	**Date**																												
357812	**BH10_0.1**	**Soil**	**29 Jul 2024**	15	35	50	<0.1	10	51	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1
357812	**DUP01**	**Soil**	**29 Jul 2024**	33	79	140	0.2	24	150	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1
RPD				75	77	95	67	67	99	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0		0	0
357812	**BH10_0.1**	**Soil**	**29 Jul 2024**	15	35	50	<0.1	10	51	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1
ES2425194	**TRIP01**	**Soil**	**29 Jul 2024**	15	27	38	<0.1	10	33	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
RPD				0	26	27	0	0	43	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0		0	0
359034	**BH24_0.1**	**Soil**	**08 Aug 2024**	27	69	200	<0.1	9	140	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1
359034	**DUP2**	**Soil**	**08 Aug 2024**	25	32	140	<0.1	7	93	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1
RPD				8	78	35	0	25	40	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0		0	0
359034	**BH24_0.1**	**Soil**	**08 Aug 2024**	27	69	200	<0.1	9	140	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1
ES2426839	**TRIP2**	**Soil**	**08 Aug 2024**	33	42	39	<0.1	11	196	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
RPD				20	49	135	0	20	33	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0		0	0

***RPDs have only been considered where a concentration is greater than 1 times the EQL.**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier rang**
*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any**

Detailed Site Investigation
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Table 4
Soil - Field Duplicate Assessment

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						Organophosphorous Pesticides																								
				Heptachlor epoxide	Hexachlorobenzene	Methoxychlor	Mirex	Azinophos methyl	Bromophos-ethyl	Carbophenothion	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Coumaphos	Demeton-S-methyl	Diazinon	Dichlorvos	Dimethoate	Disulfoton	Ethion	Fenamiphos	Fenitrothion	Fenthion	Malathion	Methidathion	Methyl parathion	Mevinphos (Phosdrin)	Monocrotophos	Parathion	Phorate	Pirimphos-ethyl
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				0.05	0.05	0.1	0.1	0.05	0.05	0.05	0.05	0.05	0.05	0.1	0.05	0.05	0.05	0.05	0.1	0.05	0.05	0.1	0.05	0.05	0.1	0.1	0.1	0.2	0.1	0.1	0.05
Lab Report Number	**Field ID**	**Matrix Type**	**Date**																												
357812	**BH10_0.1**	**Soil**	**29 Jul 2024**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			<0.1	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	
357812	**DUP01**	**Soil**	**29 Jul 2024**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			<0.1	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	
RPD				0	0	0	0	0	0			0	0	0		0	0	0	0	0	0	0	0	0	0	0	0		0	0	
357812	**BH10_0.1**	**Soil**	**29 Jul 2024**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			<0.1	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	
ES2425194	**TRIP01**	**Soil**	**29 Jul 2024**	<0.05	<0.05	<0.2		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		<0.05	<0.05	<0.05	<0.05		<0.05	<0.05		<0.05	<0.05		<0.2		<0.2	<0.2		<0.05
RPD				0	0	0		0	0			0	0			0	0	0		0	0		0	0		0			0		
359034	**BH24_0.1**	**Soil**	**08 Aug 2024**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			<0.1	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	
359034	**DUP2**	**Soil**	**08 Aug 2024**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			<0.1	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	
RPD				0	0	0	0	0	0			0	0	0		0	0	0	0	0	0	0	0	0	0	0	0		0	0	
359034	**BH24_0.1**	**Soil**	**08 Aug 2024**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			<0.1	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	
ES2426839	**TRIP2**	**Soil**	**08 Aug 2024**	<0.05	<0.05	<0.2		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		<0.05	<0.05	<0.05	<0.05		<0.05	<0.05		<0.05	<0.05		<0.2		<0.2	<0.2		<0.05
RPD				0	0	0		0	0			0	0			0	0	0		0	0		0	0		0			0		

***RPDs have only been considered where a concentration is greater than 1 times the EQL.**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier rang**
*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any**

Table 4
Soil - Field Duplicate Assessment

				Prothiofos	Ronnel	Phosalone
				mg/kg	mg/kg	mg/kg
EQL				0.05	0.1	0.1
Lab Report Number	**Field ID**	**Matrix Type**	**Date**			
357812	**BH10_0.1**	**Soil**	**29 Jul 2024**		<0.1	<0.1
357812	**DUP01**	**Soil**	**29 Jul 2024**		<0.1	<0.1
RPD					0	0
357812	**BH10_0.1**	**Soil**	**29 Jul 2024**		<0.1	<0.1
ES2425194	**TRIP01**	**Soil**	**29 Jul 2024**	<0.05		
RPD						
359034	**BH24_0.1**	**Soil**	**08 Aug 2024**		<0.1	<0.1
359034	**DUP2**	**Soil**	**08 Aug 2024**		<0.1	<0.1
RPD					0	0
359034	**BH24_0.1**	**Soil**	**08 Aug 2024**		<0.1	<0.1
ES2426839	**TRIP2**	**Soil**	**08 Aug 2024**	<0.05		
RPD						

***RPDs have only been considered where a concentration is greater than 1 times the EQL.**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier rang**
*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any**

Detailed Site Investigation
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Table 5
Water - Field Duplicate Assessment

				BTEX								TRH							TPH				
				Naphthalene (BTEX)	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene Total	Total BTEX	C6-C10 Fraction (F1)	C6-C10 (F1 minus BTEX)	>C10-C16 Fraction (F2)	>C10-C16 Fraction (F2 minus Naphthalene)	>C16-C34 Fraction (F3)	>C34-C40 Fraction (F4)	>C10-C40 Fraction (Sum)	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 Fraction (Sum)
				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL				1	1	1	1	2	1	2	1	10	10	50	50	100	100	50	10	50	100	50	50
Lab Report Number	**Field ID**	**Matrix Type**	**Date**																				
359867	**MW04**	**Water**	**22 Aug 2024**	<1	<1	<1	<1	<2	<1			15	15	<50	<50	<100	<100	<50	12	<50	<100	<100	<50
359867	**DUP1**	**Water**	**22 Aug 2024**	<1	<1	<1	<1	<2	<1			12	12	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50
RPD				0	0	0	0	0	0			22	22	0	0	0	0	0	18	0	0	0	0
359867	**MW04**	**Water**	**22 Aug 2024**	<1	<1	<1	<1	<2	<1			15	15	<50	<50	<100	<100	<50	12	<50	<100	<100	<50
ES2427802	**TRIP1**	**Water**	**22 Aug 2024**	<5	<1	<2	<2	<2	<2	<2	<1	<20	<20	<100	<100	200	<100	200	<20	<50	190	<50	190
RPD				0	0	0	0	0	0			0	0	0	0	67	0	120	0	0	62	0	117

***RPDs have only been considered where a concentration is greater than 1 times the EQL.**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 100 (0 - 5 x EQL); 75 (5 - 10 x EQL); 30 (> 10 x EQL))**
*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory**

Detailed Site Investigation
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24109RP01

Table 5
Field Duplicate Assessment

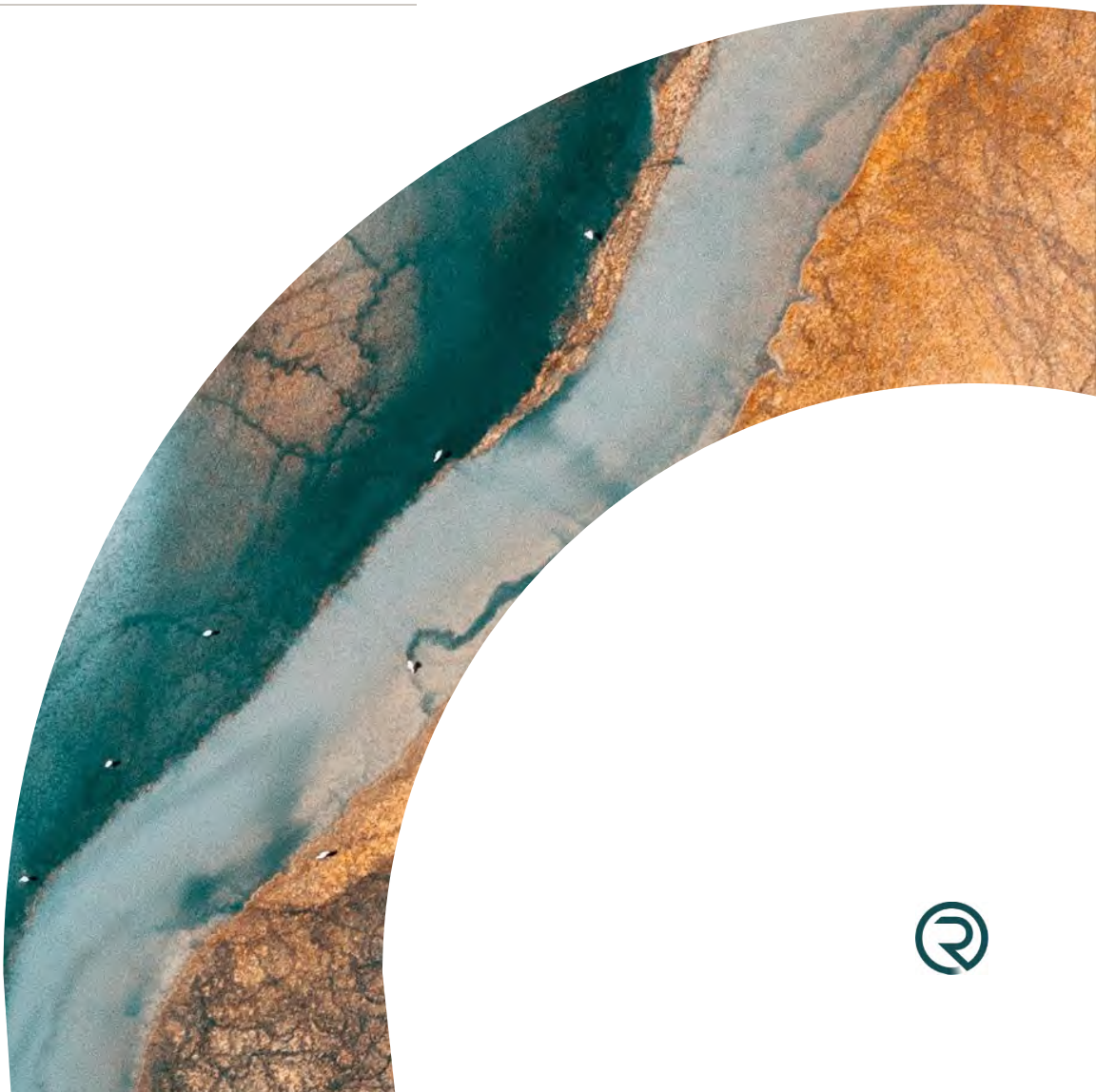
REDITUS

				PAH																			Metals							
				Benzo(b+j+k)fluoranthene	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(b+j)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	Benzo(a)pyrene TEQ	PAHs (Sum of total)	PAHs (Sum of positives)	Arsenic (filtered)	Cadmium (filtered)	Chromium (III+VI) (filtered)	Copper (filtered)	Lead (filtered)	Mercury (filtered)	Nickel (filtered)	Zinc (filtered)
				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL				0.2	0.1	0.1	0.1	0.1	0.1	1	0.1	1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.5	0.1	1	0.1	1	1	1	0.05	1	1
Lab Report Number	**Field ID**	**Matrix Type**	**Date**																												
359867	**MW04**	**Water**	**22 Aug 2024**	<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	<0.5		<0.1	<1	1.1	<1	<1	<1	<0.05	180	560
359867	**DUP1**	**Water**	**22 Aug 2024**	<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	<0.5		<0.1	<1	1.2	<1	1	<1	<0.05	180	560
RPD				0	0	0	0	0	0		0		0	0	0	0	0	0	0	0	0		0	0	9	0	0	0	0	0	0
359867	**MW04**	**Water**	**22 Aug 2024**	<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	<0.5		<0.1	<1	1.1	<1	<1	<1	<0.05	180	560
ES2427802	**TRIP1**	**Water**	**22 Aug 2024**		<1.0	<1.0	<1.0	<1.0	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		<0.5		<1	1.0	<1	<1	<1	<0.1	181	520
RPD					0	0	0	0	0		0		0	0	0	0	0	0	0	0				0	10	0	0	0	0	1	7

***RPDs have only been considered where a concentration is greater than 1 times the EQL.**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier ran**
*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any**

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Envirolab 357812 & 359034
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ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 357812

Client Details

Client	Reditus Consulting
Attention	Tiarni Wiersma
Address	Shop 1, 29-33 Waratah St, KIRRAWEE, NSW, 2232

Sample Details

Your Reference	**24109 - Rhodes DSI**
Number of Samples	28 Soil
Date samples received	30/07/2024
Date completed instructions received	30/07/2024

Analysis Details

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

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

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

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

Report Details

Date results requested by	06/08/2024
Date of Issue	06/08/2024

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Asbestos Approved By
Analysed by Asbestos Approved Analyst: Sneha Shakya
Authorised by Asbestos Approved Signatory: Nyovan Moonean

Results Approved By
Dragana Tomas, Senior Chemist
Giovanni Agosti, Group Technical Manager
Nyovan Moonean, Asbestos Approved Identifier/Counter
Timothy Toll, Senior Chemist

Authorised By
Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		357812-1	357812-4	357812-6	357812-7	357812-9
Your Reference	UNITS	BH01_0.1	BH02_0.25	BH03_0.3	BH04_0.15	BH05_0.1
Depth		0.1	0.25	0.3	0.15	0.1
Date Sampled		29/07/2024	29/07/2024	29/07/2024	29/07/2024	29/07/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/07/2024	31/07/2024	31/07/2024	31/07/2024	31/07/2024
Date analysed	-	06/08/2024	06/08/2024	06/08/2024	06/08/2024	06/08/2024
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	75	67	93	82	86

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		357812-12	357812-13	357812-15	357812-17	357812-18
Your Reference	UNITS	BH06_0.3	BH07_0.1	BH08_0.1	BH09_0.3	BH10_0.1
Depth		0.3	0.1	0.1	0.3	0.1
Date Sampled		29/07/2024	29/07/2024	29/07/2024	29/07/2024	29/07/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/07/2024	31/07/2024	31/07/2024	31/07/2024	31/07/2024
Date analysed	-	06/08/2024	06/08/2024	06/08/2024	06/08/2024	06/08/2024
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	95	104	73	74	92

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		357812-21	357812-22	357812-24	357812-25	357812-27
Your Reference	UNITS	BH11_0.2	BH12_0.15	BH13_0.25	BH14_0.1	BH16_0.3
Depth		0.2	0.15	0.25	0.1	0.3
Date Sampled		29/07/2024	29/07/2024	29/07/2024	29/07/2024	29/07/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/07/2024	31/07/2024	31/07/2024	31/07/2024	31/07/2024
Date analysed	-	06/08/2024	06/08/2024	06/08/2024	06/08/2024	06/08/2024
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	101	94	98	92	91

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		357812-28
Your Reference	UNITS	DUP01
Depth		-
Date Sampled		29/07/2024
Type of sample		Soil
Date extracted	-	31/07/2024
Date analysed	-	06/08/2024
TRH C_6 - C_9	mg/kg	<25
TRH C_6 - C_{10}	mg/kg	<25
vTRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
Naphthalene	mg/kg	<1
Total +ve Xylenes	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	84

svTRH (C10-C40) in Soil						
Our Reference		357812-1	357812-4	357812-6	357812-7	357812-9
Your Reference	UNITS	BH01_0.1	BH02_0.25	BH03_0.3	BH04_0.15	BH05_0.1
Depth		0.1	0.25	0.3	0.15	0.1
Date Sampled		29/07/2024	29/07/2024	29/07/2024	29/07/2024	29/07/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/07/2024	31/07/2024	31/07/2024	31/07/2024	31/07/2024
Date analysed	-	01/08/2024	01/08/2024	01/08/2024	01/08/2024	01/08/2024
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	210
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	170
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	380
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	120	<100	<100	<100	340
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	100
Total +ve TRH (>C10-C40)	mg/kg	120	<50	<50	<50	440
Surrogate o-Terphenyl	%	76	75	74	77	98

svTRH (C10-C40) in Soil						
Our Reference		357812-12	357812-13	357812-15	357812-17	357812-18
Your Reference	UNITS	BH06_0.3	BH07_0.1	BH08_0.1	BH09_0.3	BH10_0.1
Depth		0.3	0.1	0.1	0.3	0.1
Date Sampled		29/07/2024	29/07/2024	29/07/2024	29/07/2024	29/07/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/07/2024	31/07/2024	31/07/2024	31/07/2024	31/07/2024
Date analysed	-	01/08/2024	01/08/2024	01/08/2024	01/08/2024	01/08/2024
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	120	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	120	<50	<50
Surrogate o-Terphenyl	%	98	93	101	94	97

svTRH (C10-C40) in Soil						
Our Reference		357812-21	357812-22	357812-24	357812-25	357812-27
Your Reference	UNITS	BH11_0.2	BH12_0.15	BH13_0.25	BH14_0.1	BH16_0.3
Depth		0.2	0.15	0.25	0.1	0.3
Date Sampled		29/07/2024	29/07/2024	29/07/2024	29/07/2024	29/07/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/07/2024	31/07/2024	31/07/2024	31/07/2024	31/07/2024
Date analysed	-	01/08/2024	01/08/2024	01/08/2024	01/08/2024	01/08/2024
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	120	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	120	<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	180	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	180	<50	<50	<50
Surrogate o-Terphenyl	%	96	98	92	100	95

svTRH (C10-C40) in Soil		
Our Reference		357812-28
Your Reference	UNITS	DUP01
Depth		-
Date Sampled		29/07/2024
Type of sample		Soil
Date extracted	-	31/07/2024
Date analysed	-	01/08/2024
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	100
TRH >C_{10} -C_{16}	mg/kg	<50
TRH >C_{10} -C_{16} less Naphthalene (F2)	mg/kg	<50
TRH >C_{16} -C_{34}	mg/kg	170
TRH >C_{34} -C_{40}	mg/kg	<100
Total +ve TRH (>C10-C40)	mg/kg	170
Surrogate o-Terphenyl	%	98

PAHs in Soil						
Our Reference		357812-1	357812-4	357812-6	357812-7	357812-9
Your Reference	UNITS	BH01_0.1	BH02_0.25	BH03_0.3	BH04_0.15	BH05_0.1
Depth		0.1	0.25	0.3	0.15	0.1
Date Sampled		29/07/2024	29/07/2024	29/07/2024	29/07/2024	29/07/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/07/2024	31/07/2024	31/07/2024	31/07/2024	31/07/2024
Date analysed	-	01/08/2024	31/07/2024	31/07/2024	01/08/2024	01/08/2024
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.3
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	0.8
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.4
Fluoranthene	mg/kg	0.6	0.3	<0.1	<0.1	3.2
Pyrene	mg/kg	0.7	0.4	<0.1	<0.1	3.7
Benzo(a)anthracene	mg/kg	0.5	0.2	<0.1	<0.1	2.3
Chrysene	mg/kg	0.4	0.3	<0.1	<0.1	1.7
Benzo(b,j+k)fluoranthene	mg/kg	0.9	0.5	<0.2	<0.2	3.8
Benzo(a)pyrene	mg/kg	0.58	0.3	<0.05	0.05	2.4
Indeno(1,2,3-c,d)pyrene	mg/kg	0.3	0.2	<0.1	<0.1	1.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.3
Benzo(g,h,i)perylene	mg/kg	0.5	0.2	<0.1	<0.1	1.8
Total +ve PAH's	mg/kg	4.6	2.6	<0.05	0.05	22
Benzo(a)pyrene TEQ calc (zero)	mg/kg	0.8	<0.5	<0.5	<0.5	3.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	0.8	<0.5	<0.5	<0.5	3.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	0.9	0.5	<0.5	<0.5	3.5
Surrogate p-Terphenyl-d14	%	83	89	77	82	107

PAHs in Soil						
Our Reference		357812-12	357812-13	357812-15	357812-17	357812-18
Your Reference	UNITS	BH06_0.3	BH07_0.1	BH08_0.1	BH09_0.3	BH10_0.1
Depth		0.3	0.1	0.1	0.3	0.1
Date Sampled		29/07/2024	29/07/2024	29/07/2024	29/07/2024	29/07/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/07/2024	31/07/2024	31/07/2024	31/07/2024	31/07/2024
Date analysed	-	31/07/2024	01/08/2024	01/08/2024	31/07/2024	01/08/2024
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	0.1	0.6
Pyrene	mg/kg	<0.1	<0.1	<0.1	0.2	0.7
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	0.1	0.4
Chrysene	mg/kg	<0.1	<0.1	<0.1	0.1	0.3
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	0.7
Benzo(a)pyrene	mg/kg	<0.05	0.06	<0.05	0.1	0.4
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	0.1	0.3
Total +ve PAH's	mg/kg	<0.05	0.06	<0.05	0.72	3.8
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	0.6
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	0.6
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	0.7
Surrogate p-Terphenyl-d14	%	109	104	107	108	130

PAHs in Soil						
Our Reference		357812-21	357812-22	357812-24	357812-25	357812-27
Your Reference	UNITS	BH11_0.2	BH12_0.15	BH13_0.25	BH14_0.1	BH16_0.3
Depth		0.2	0.15	0.25	0.1	0.3
Date Sampled		29/07/2024	29/07/2024	29/07/2024	29/07/2024	29/07/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/07/2024	31/07/2024	31/07/2024	31/07/2024	31/07/2024
Date analysed	-	01/08/2024	01/08/2024	01/08/2024	01/08/2024	31/07/2024
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	0.3	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	1.4	<0.1	0.2	0.2
Pyrene	mg/kg	0.1	1.6	<0.1	0.2	0.2
Benzo(a)anthracene	mg/kg	<0.1	1	<0.1	0.1	0.1
Chrysene	mg/kg	<0.1	0.8	<0.1	<0.1	0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	2	<0.2	0.2	<0.2
Benzo(a)pyrene	mg/kg	0.05	1.2	<0.05	0.1	0.08
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	0.6	<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	0.9	<0.1	0.1	<0.1
Total +ve PAH's	mg/kg	0.2	9.7	<0.05	0.89	0.66
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	1.7	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	1.7	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	1.7	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	109	107	104	110	116

PAHs in Soil		
Our Reference		357812-28
Your Reference	UNITS	DUP01
Depth		-
Date Sampled		29/07/2024
Type of sample		Soil
Date extracted	-	31/07/2024
Date analysed	-	01/08/2024
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	0.4
Anthracene	mg/kg	0.1
Fluoranthene	mg/kg	1.9
Pyrene	mg/kg	2.0
Benzo(a)anthracene	mg/kg	1.2
Chrysene	mg/kg	1.0
Benzo(b,j+k)fluoranthene	mg/kg	2.2
Benzo(a)pyrene	mg/kg	1.4
Indeno(1,2,3-c,d)pyrene	mg/kg	0.7
Dibenzo(a,h)anthracene	mg/kg	0.2
Benzo(g,h,i)perylene	mg/kg	1.0
Total +ve PAH's	mg/kg	12
Benzo(a)pyrene TEQ calc (zero)	mg/kg	2.0
Benzo(a)pyrene TEQ calc(half)	mg/kg	2.0
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	2.0
Surrogate p-Terphenyl-d14	%	113

Organochlorine Pesticides in soil						
Our Reference		357812-1	357812-7	357812-9	357812-13	357812-15
Your Reference	UNITS	BH01_0.1	BH04_0.15	BH05_0.1	BH07_0.1	BH08_0.1
Depth		0.1	0.15	0.1	0.1	0.1
Date Sampled		29/07/2024	29/07/2024	29/07/2024	29/07/2024	29/07/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/07/2024	31/07/2024	31/07/2024	31/07/2024	31/07/2024
Date analysed	-	01/08/2024	01/08/2024	01/08/2024	01/08/2024	01/08/2024
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate 4-Chloro-3-NBTF	%	66	83	106	99	108
Total Positive Aldrin+Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1

Organochlorine Pesticides in soil						
Our Reference		357812-18	357812-21	357812-22	357812-24	357812-25
Your Reference	UNITS	BH10_0.1	BH11_0.2	BH12_0.15	BH13_0.25	BH14_0.1
Depth		0.1	0.2	0.15	0.25	0.1
Date Sampled		29/07/2024	29/07/2024	29/07/2024	29/07/2024	29/07/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/07/2024	31/07/2024	31/07/2024	31/07/2024	31/07/2024
Date analysed	-	01/08/2024	01/08/2024	01/08/2024	01/08/2024	01/08/2024
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate 4-Chloro-3-NBTF	%	111	105	90	99	102
Total Positive Aldrin+Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1

Organochlorine Pesticides in soil		
Our Reference		357812-28
Your Reference	UNITS	DUP01
Depth		-
Date Sampled		29/07/2024
Type of sample		Soil
Date extracted	-	31/07/2024
Date analysed	-	01/08/2024
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
Mirex	mg/kg	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1
Surrogate 4-Chloro-3-NBTF	%	94
Total Positive Aldrin+Dieldrin	mg/kg	<0.1

Organophosphorus Pesticides in Soil						
Our Reference		357812-1	357812-7	357812-9	357812-13	357812-15
Your Reference	UNITS	BH01_0.1	BH04_0.15	BH05_0.1	BH07_0.1	BH08_0.1
Depth		0.1	0.15	0.1	0.1	0.1
Date Sampled		29/07/2024	29/07/2024	29/07/2024	29/07/2024	29/07/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/07/2024	31/07/2024	31/07/2024	31/07/2024	31/07/2024
Date analysed	-	01/08/2024	01/08/2024	01/08/2024	01/08/2024	01/08/2024
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Mevinphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phorate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Disulfoton	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion-Methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenthion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methidathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenamiphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phosalone	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Coumaphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate 4-Chloro-3-NBTF	%	66	83	106	99	108

Organophosphorus Pesticides in Soil						
Our Reference		357812-18	357812-21	357812-22	357812-24	357812-25
Your Reference	UNITS	BH10_0.1	BH11_0.2	BH12_0.15	BH13_0.25	BH14_0.1
Depth		0.1	0.2	0.15	0.25	0.1
Date Sampled		29/07/2024	29/07/2024	29/07/2024	29/07/2024	29/07/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/07/2024	31/07/2024	31/07/2024	31/07/2024	31/07/2024
Date analysed	-	01/08/2024	01/08/2024	01/08/2024	01/08/2024	01/08/2024
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Mevinphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phorate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Disulfoton	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion-Methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenthion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methidathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenamiphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phosalone	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Coumaphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate 4-Chloro-3-NBTF	%	111	105	90	99	102

Organophosphorus Pesticides in Soil		
Our Reference		357812-28
Your Reference	UNITS	DUP01
Depth		-
Date Sampled		29/07/2024
Type of sample		Soil
Date extracted	-	31/07/2024
Date analysed	-	01/08/2024
Dichlorvos	mg/kg	<0.1
Mevinphos	mg/kg	<0.1
Phorate	mg/kg	<0.1
Dimethoate	mg/kg	<0.1
Diazinon	mg/kg	<0.1
Disulfoton	mg/kg	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1
Parathion-Methyl	mg/kg	<0.1
Ronnel	mg/kg	<0.1
Fenitrothion	mg/kg	<0.1
Malathion	mg/kg	<0.1
Chlorpyriphos	mg/kg	<0.1
Fenthion	mg/kg	<0.1
Parathion	mg/kg	<0.1
Bromophos-ethyl	mg/kg	<0.1
Methidathion	mg/kg	<0.1
Fenamiphos	mg/kg	<0.1
Ethion	mg/kg	<0.1
Phosalone	mg/kg	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1
Coumaphos	mg/kg	<0.1
Surrogate 4-Chloro-3-NBTF	%	94

Acid Extractable metals in soil						
Our Reference		357812-1	357812-4	357812-6	357812-7	357812-9
Your Reference	UNITS	BH01_0.1	BH02_0.25	BH03_0.3	BH04_0.15	BH05_0.1
Depth		0.1	0.25	0.3	0.15	0.1
Date Sampled		29/07/2024	29/07/2024	29/07/2024	29/07/2024	29/07/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	31/07/2024	31/07/2024	31/07/2024	31/07/2024	31/07/2024
Date analysed	-	01/08/2024	01/08/2024	01/08/2024	01/08/2024	01/08/2024
Arsenic	mg/kg	9	11	10	5	8
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	2
Chromium	mg/kg	18	37	30	12	35
Copper	mg/kg	41	57	17	26	280
Lead	mg/kg	110	170	28	33	470
Mercury	mg/kg	0.1	0.2	0.2	<0.1	0.2
Nickel	mg/kg	9	16	11	5	13
Zinc	mg/kg	82	170	34	74	270

Acid Extractable metals in soil						
Our Reference		357812-12	357812-13	357812-15	357812-17	357812-18
Your Reference	UNITS	BH06_0.3	BH07_0.1	BH08_0.1	BH09_0.3	BH10_0.1
Depth		0.3	0.1	0.1	0.3	0.1
Date Sampled		29/07/2024	29/07/2024	29/07/2024	29/07/2024	29/07/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	31/07/2024	31/07/2024	31/07/2024	31/07/2024	31/07/2024
Date analysed	-	01/08/2024	01/08/2024	01/08/2024	01/08/2024	01/08/2024
Arsenic	mg/kg	5	<4	7	9	6
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	14	6	15	19	15
Copper	mg/kg	22	8	44	34	35
Lead	mg/kg	31	33	35	72	50
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	5	3	9	8	10
Zinc	mg/kg	10	31	130	43	51

Acid Extractable metals in soil						
Our Reference		357812-21	357812-22	357812-24	357812-25	357812-27
Your Reference	UNITS	BH11_0.2	BH12_0.15	BH13_0.25	BH14_0.1	BH16_0.3
Depth		0.2	0.15	0.25	0.1	0.3
Date Sampled		29/07/2024	29/07/2024	29/07/2024	29/07/2024	29/07/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	31/07/2024	31/07/2024	31/07/2024	31/07/2024	31/07/2024
Date analysed	-	01/08/2024	01/08/2024	01/08/2024	01/08/2024	01/08/2024
Arsenic	mg/kg	9	9	11	7	6
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	16	20	19	18	16
Copper	mg/kg	23	45	14	27	18
Lead	mg/kg	52	180	24	970	62
Mercury	mg/kg	<0.1	0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	6	11	5	7	5
Zinc	mg/kg	76	95	85	85	41

Acid Extractable metals in soil		
Our Reference		357812-28
Your Reference	UNITS	DUP01
Depth		-
Date Sampled		29/07/2024
Type of sample		Soil
Date prepared	-	31/07/2024
Date analysed	-	01/08/2024
Arsenic	mg/kg	12
Cadmium	mg/kg	0.7
Chromium	mg/kg	33
Copper	mg/kg	79
Lead	mg/kg	140
Mercury	mg/kg	0.2
Nickel	mg/kg	24
Zinc	mg/kg	150

Moisture						
Our Reference		357812-1	357812-4	357812-6	357812-7	357812-9
Your Reference	UNITS	BH01_0.1	BH02_0.25	BH03_0.3	BH04_0.15	BH05_0.1
Depth		0.1	0.25	0.3	0.15	0.1
Date Sampled		29/07/2024	29/07/2024	29/07/2024	29/07/2024	29/07/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	31/07/2024	31/07/2024	31/07/2024	31/07/2024	31/07/2024
Date analysed	-	01/08/2024	01/08/2024	01/08/2024	01/08/2024	01/08/2024
Moisture	%	19	19	24	25	20

Moisture						
Our Reference		357812-12	357812-13	357812-15	357812-17	357812-18
Your Reference	UNITS	BH06_0.3	BH07_0.1	BH08_0.1	BH09_0.3	BH10_0.1
Depth		0.3	0.1	0.1	0.3	0.1
Date Sampled		29/07/2024	29/07/2024	29/07/2024	29/07/2024	29/07/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	31/07/2024	31/07/2024	31/07/2024	31/07/2024	31/07/2024
Date analysed	-	01/08/2024	01/08/2024	01/08/2024	01/08/2024	01/08/2024
Moisture	%	27	17	32	16	28

Moisture						
Our Reference		357812-21	357812-22	357812-24	357812-25	357812-27
Your Reference	UNITS	BH11_0.2	BH12_0.15	BH13_0.25	BH14_0.1	BH16_0.3
Depth		0.2	0.15	0.25	0.1	0.3
Date Sampled		29/07/2024	29/07/2024	29/07/2024	29/07/2024	29/07/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	31/07/2024	31/07/2024	31/07/2024	31/07/2024	31/07/2024
Date analysed	-	01/08/2024	01/08/2024	01/08/2024	01/08/2024	01/08/2024
Moisture	%	22	23	22	40	17

Moisture		
Our Reference		357812-28
Your Reference	UNITS	DUP01
Depth		-
Date Sampled		29/07/2024
Type of sample		Soil
Date prepared	-	31/07/2024
Date analysed	-	01/08/2024
Moisture	%	65

Asbestos ID - soils						
Our Reference		357812-1	357812-7	357812-9	357812-13	357812-15
Your Reference	UNITS	BH01_0.1	BH04_0.15	BH05_0.1	BH07_0.1	BH08_0.1
Depth		0.1	0.15	0.1	0.1	0.1
Date Sampled		29/07/2024	29/07/2024	29/07/2024	29/07/2024	29/07/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	05/08/2024	05/08/2024	05/08/2024	05/08/2024	05/08/2024
Sample mass tested	g	Approx. 55g	Approx. 50g	Approx. 50g	Approx. 55g	Approx. 40g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Grey coarse-grained soil & rocks
Asbestos ID in soil	-	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
Asbestos comments	-	Nil	Nil	Nil	Nil	Nil
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils						
Our Reference		357812-18	357812-21	357812-22	357812-24	357812-25
Your Reference	UNITS	BH10_0.1	BH11_0.2	BH12_0.15	BH13_0.25	BH14_0.1
Depth		0.1	0.2	0.15	0.25	0.1
Date Sampled		29/07/2024	29/07/2024	29/07/2024	29/07/2024	29/07/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	05/08/2024	05/08/2024	05/08/2024	05/08/2024	05/08/2024
Sample mass tested	g	Approx. 50g	Approx. 55g	Approx. 45g	Approx. 50g	Approx. 40g
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	-	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
Asbestos comments	-	Nil	Nil	Nil	Nil	Nil
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

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.
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-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.

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-4	357812-7
Date extracted	-			31/07/2024	1	31/07/2024	31/07/2024		31/07/2024	31/07/2024
Date analysed	-			06/08/2024	1	06/08/2024	06/08/2024		06/08/2024	06/08/2024
TRH C_6 - C_9	mg/kg	25	Org-023	<25	1	<25	<25	0	92	87
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	1	<25	<25	0	92	87
Benzene	mg/kg	0.2	Org-023	<0.2	1	<0.2	<0.2	0	92	88
Toluene	mg/kg	0.5	Org-023	<0.5	1	<0.5	<0.5	0	89	85
Ethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	91	86
m+p-xylene	mg/kg	2	Org-023	<2	1	<2	<2	0	94	89
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	92	88
Naphthalene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	101	1	75	76	1	93	93

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	21	31/07/2024	05/08/2024		[NT]	[NT]
Date analysed	-			[NT]	21	06/08/2024	06/08/2024		[NT]	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	[NT]	21	<25	<25	0	[NT]	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	[NT]	21	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	[NT]	21	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	[NT]	21	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	[NT]	21	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	[NT]	21	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-023	[NT]	21	<1	<1	0	[NT]	[NT]
Naphthalene	mg/kg	1	Org-023	[NT]	21	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	21	101	80	23	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	357812-7
Date extracted	-			31/07/2024	1	31/07/2024	31/07/2024		31/07/2024	31/07/2024
Date analysed	-			01/08/2024	1	01/08/2024	01/08/2024		01/08/2024	01/08/2024
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	1	<50	<50	0	110	92
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	1	<100	<100	0	104	102
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	1	<100	<100	0	86	110
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	1	<50	<50	0	110	92
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	1	120	110	9	104	102
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	1	<100	<100	0	86	110
Surrogate o-Terphenyl	%		Org-020	71	1	76	75	1	98	100

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	21	31/07/2024	31/07/2024		[NT]	[NT]
Date analysed	-			[NT]	21	01/08/2024	01/08/2024		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	21	<50	<50	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	21	<100	<100	0	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	21	<100	<100	0	[NT]	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	[NT]	21	<50	<50	0	[NT]	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	[NT]	21	<100	<100	0	[NT]	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	[NT]	21	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-020	[NT]	21	96	98	2	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	357812-7
Date extracted	-			31/07/2024	1	31/07/2024	31/07/2024		31/07/2024	31/07/2024
Date analysed	-			01/08/2024	1	01/08/2024	01/08/2024		01/08/2024	01/08/2024
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	82	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	76	88
Fluorene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	76	86
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	1	0.1	0.2	67	94	115
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	0.6	0.8	29	86	118
Pyrene	mg/kg	0.1	Org-022/025	<0.1	1	0.7	0.9	25	84	112
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	0.5	0.5	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	1	0.4	0.5	22	68	85
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	1	0.9	1	11	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	1	0.58	0.67	14	78	95
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	1	0.3	0.4	29	[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	0.5	0.6	18	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	75	1	83	83	0	90	105

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	21	31/07/2024	01/08/2024		[NT]	[NT]
Date analysed	-			[NT]	21	01/08/2024	01/08/2024		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-022/025	[NT]	21	0.1	<0.1	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	21	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	21	0.05	<0.05	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	21	109	131	18	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	357812-7
Date extracted	-			31/07/2024	1	31/07/2024	31/07/2024		31/07/2024	31/07/2024
Date analysed	-			01/08/2024	1	01/08/2024	01/08/2024		01/08/2024	01/08/2024
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	88	94
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	86	94
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	90	94
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	88	94
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	98	102
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	82	92
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	92	106
Endrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	90	108
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	104
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	88	98
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Mirex	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	66	1	66	81	20	77	95

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	21	31/07/2024	01/08/2024		[NT]	[NT]
Date analysed	-			[NT]	21	01/08/2024	01/08/2024		[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
HCB	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Mirex	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	[NT]	21	105	86	20	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	357812-7
Date extracted	-			31/07/2024	1	31/07/2024	31/07/2024		31/07/2024	31/07/2024
Date analysed	-			01/08/2024	1	01/08/2024	01/08/2024		01/08/2024	01/08/2024
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	102	92
Mevinphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Phorate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Disulfoton	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Parathion-Methyl	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	80	88
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	72	108
Malathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	80	94
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	78	92
Fenthion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	70	98
Bromophos-ethyl	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Methidathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fenamiphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	80	94
Phosalone	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Coumaphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	66	1	66	81	20	77	95

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	21	31/07/2024	01/08/2024		[NT]	[NT]
Date analysed	-			[NT]	21	01/08/2024	01/08/2024		[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Mevinphos	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Phorate	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Disulfoton	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Parathion-Methyl	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Fenthion	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Methidathion	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Fenamiphos	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Phosalone	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Coumaphos	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	[NT]	21	105	86	20	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	357812-7
Date prepared	-			31/07/2024	1	31/07/2024	31/07/2024		31/07/2024	31/07/2024
Date analysed	-			01/08/2024	1	01/08/2024	01/08/2024		01/08/2024	01/08/2024
Arsenic	mg/kg	4	Metals-020	<4	1	9	9	0	106	101
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	96	84
Chromium	mg/kg	1	Metals-020	<1	1	18	19	5	101	92
Copper	mg/kg	1	Metals-020	<1	1	41	40	2	99	99
Lead	mg/kg	1	Metals-020	<1	1	110	110	0	102	90
Mercury	mg/kg	0.1	Metals-021	<0.1	1	0.1	0.1	0	104	93
Nickel	mg/kg	1	Metals-020	<1	1	9	9	0	101	92
Zinc	mg/kg	1	Metals-020	<1	1	82	80	2	99	76

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	21	31/07/2024	31/07/2024		[NT]	[NT]
Date analysed	-			[NT]	21	01/08/2024	01/08/2024		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	21	9	8	12	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	21	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	21	16	15	6	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	21	23	25	8	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	21	52	48	8	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	21	6	7	15	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	21	76	80	5	[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.

Report Comments

Asbestos: A portion of the supplied sample was sub-sampled for asbestos according to ASB-001 asbestos subsampling procedure. We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab/MPL recommends supplying 40-60g or 500ml of sample in its own container.

Note: Samples requested for testing were sub-sampled from bags provided by the client.

COC: 30/07/24 1305

CHAIN OF CUSTODY FORM - Client

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ENVIROLAB GROUP
National phone number 1300 424 344

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.com.au

Adelaide Office - Envirolab Services
7a The Parade, Norwood, SA 5067
✆ 08 7087 6800 | ✉ adelaide@envirolab.com.au

Brisbane Office - Envirolab Services
20a, 10-20 Depot St, Banyo, QLD 4014
✆ 07 3266 9532 | ✉ brisbane@envirolab.com.au

Darwin Office - Envirolab Services
Unit 7, 17 Willes Rd, Berrimah, NT 0820
✆ 08 8967 1201 | ✉ darwin@envirolab.com.au

Client: Reditus Consulting	Client Project Name/Number/Site etc (ie report title): 24109 - Rhodes DSI
Contact Person: Dean Stafford	
Project Mgr: Dean Stafford	PO No.: 24109
Sampler: Tiarni Wiersma	Envirolab Quote No. :
Address: Unit 1A, Level 1, 29-33 Waratah Street Kirrawee NSW	Date results required: STANDARD
	Or choose: standard / same day / 1 day / 2 day / 3 day *Note: Inform lab in advance if urgent turnaround is required - surcharges apply*
Phone: 02 9521 6567 Mob: 0487 340 857	Additional report format: esdat
Email Invoice To: accounts@reditusconsulting.com deanstafford@reditus.com.au	Lab Comments:
Email Results To: deanstafford@reditus.com.au tiarniwiersma@reditus.com.au	

Sample information					Tests Required														Comments
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Combo 5b (fill - opps)	Combo 3 (natural)	Asbestos (NEPM)	pH and Cation Exchange Capacity	HOLD										Provide as much information about the sample as you can
1	BH01_0.1	0.1	29.07.2024	Soil	x		x												
2	BH01_0.3	0.3	29.07.2024	Soil					x										
3	BH02_0.1	0.1	29.07.2024	Soil					x										
4	BH02_0.25	0.25	29.07.2024	Soil		x													
5	BH03_0.1	0.1	29.07.2024	Soil					x										
6	BH03_0.3	0.3	29.07.2024	Soil		x													
7	BH04_0.15	0.15	29.07.2024	Soil	x		x												
8	BH04_0.3	0.3	29.07.2024	Soil					x										
9	BH05_0.1	0.1	29.07.2024	Soil	x		x												
10	BH05_0.3	0.3	29.07.2024	Soil					x										
11	BH06_0.1	0.1	29.07.2024	Soil					x										
12	BH06_0.3	0.3	29.07.2024	Soil		x													
13	BH07_0.1	0.1	29.07.2024	Soil	x		x												
14	BH07_0.3	0.3	29.07.2024	Soil					x										
15	BH08_0.1	0.1	29.07.2024	Soil	x		x												
				Sample Count	5	3	5		7										

Please tick the box if observed settled sediment present in water samples is to be included in the extraction and/or analysis

Relinquished by (Company): Reditus	Received by (Company): ELS SYD	Lab Use Only	
Print Name: Tiarni Wiersma	Print Name: Christine Ho	Job number: 357812	Cooling: Ice / Ice pack / None
Date & Time: 30.07/2024	Date & Time: 0930 30/7/24	Temperature: 3°C	Security seal: Intact / Broken / None
Signature: T.Wiersma	Signature:	TAT Req - SAME day / 1 / 2 / 3 / 4 / STD	

#357812.

CHAIN OF CUSTODY FORM - Client

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ENVIROLAB GROUP
National phone number 1300 424 344

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.com.au

Adelaide Office - Envirolab Services
7a The Parade, Norwood, SA 5067
✆ 08 7087 6800 | ✉ adelaide@envirolab.com.au

Brisbane Office - Envirolab Services
20a, 10-20 Depot St, Banyo, QLD 4014
✆ 07 3266 9532 | ✉ brisbane@envirolab.com.au

Darwin Office - Envirolab Services
Unit 7, 17 Willes Rd, Berrimah, NT 0820
✆ 08 8967 1201 | ✉ darwin@envirolab.com.au

Client: Reditus Consulting	**Client Project Name/Number/Site etc (ie report title):** 24109 - Rhodes DSI
Contact Person: Dean Stafford	
Project Mgr: Dean Stafford	**PO No.: 24109**
Sampler: Tiarni Wiersma	**Envirolab Quote No. :**
Address: Unit 1A, Level 1, 29-33 Waratah Street Kirrawee NSW	**Date results required:** STANDARD **Or choose:** standard / same day / 1 day / 2 day / 3 day *Note: Inform lab in advance if urgent turnaround is required - surcharges apply*
Phone: 02 9521 6567 **Mob:** 0487 340 857	**Additional report format: esdat**
Email Invoice To: accounts@reditusconsulting.com, deanstafford@reditus.com.au	**Lab Comments:**
Email Results To: deanstafford@reditus.com.au, tiarniwiersma@reditus.com.au	

Sample information					Tests Required														Comments
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Combo 5b (fill - opps)	Combo 3 (natural)	Asbestos (NEPM)	pH and Cation Exchange Capacity	HOLD										Provide as much information about the sample as you can
16	BH09_0.1	0.1	29.07.2024	Soil															
17	BH09_0.3	0.3	29.07.2024	Soil		x													
18	BH10_0.1	0.1	29.07.2024	Soil	x		x												
19	BH10_0.3	0.3	29.07.2024	Soil					x										
20	BH11_0.05	0.05	29.07.2024	Soil					x										
21	BH11_0.2	0.2	29.07.2024	Soil	x		x												
22	BH12_0.15	0.15	29.07.2024	Soil	x		x												
23	BH13_0.1	0.1	29.07.2024	Soil					x										
24	BH13_0.25	0.25	29.07.2024	Soil	x		x												
25	BH14_0.1	0.1	29.07.2024	Soil	x		x		x										
26	BH16_0.1	0.1	29.07.2024	Soil					x										
27	BH16_0.3	0.3	29.07.2024	Soil		x													
28	DUP01		29.07.2024	Soil	x														
5/0	TRIP01		29.07.2024	Soil	x														Please Forward to ALS
				Sample Count	7	2	5		5										

☐ *Please tick the box if observed settled sediment present in water samples is to be included in the extraction and/or analysis*

Relinquished by (Company): Reditus	**Received by (Company):**	*Lab Use Only*	
Print Name: Tiarni Wiersma	**Print Name:** CH	**Job number:** 357812	**Cooling:** Ice / Ice pack / None
Date & Time: 30.07/2024	**Date & Time:** 30/7/24 0930	**Temperature:** 3°C	**Security seal:** Intact / Broken / None
Signature: T.Wiersma	**Signature:**	**TAT Req - SAME day / 1 / 2 / 3 / 4 / STD**	

#357812.

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	Reditus Consulting
Attention	Tiarni Wiersma

Sample Login Details

Your reference	24109 - Rhodes DSI
Envirolab Reference	357812
Date Sample Received	30/07/2024
Date Instructions Received	30/07/2024
Date Results Expected to be Reported	06/08/2024

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	28 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	3
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Insufficient sample for NEPM asbestos.

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:

svTRH (C10-C40) in Soil						
Our Reference		359034-1	359034-2	359034-4	359034-5	359034-7
Your Reference	UNITS	BH15_0.1	BH17_0.1	BH18_0.25	BH19_0.1	BH20_0.2
Depth		0.1	0.1	0.25	0.1	0.2
Date Sampled		08/08/2024	08/08/2024	08/08/2024	08/08/2024	08/08/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/08/2024	14/08/2024	14/08/2024	14/08/2024	14/08/2024
Date analysed	-	15/08/2024	15/08/2024	15/08/2024	15/08/2024	15/08/2024
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	120	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	120	<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	140	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	140	<50	<50	<50
Surrogate o-Terphenyl	%	94	94	93	92	96

svTRH (C10-C40) in Soil						
Our Reference		359034-8	359034-10	359034-11	359034-12	359034-13
Your Reference	UNITS	BH21_0.2	BH22_0.25	BH23_0.15	BH24_0.1	BH25_0.25
Depth		0.2	0.25	0.15	0.1	0.25
Date Sampled		08/08/2024	08/08/2024	08/08/2024	08/08/2024	08/08/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/08/2024	14/08/2024	14/08/2024	14/08/2024	14/08/2024
Date analysed	-	15/08/2024	15/08/2024	15/08/2024	15/08/2024	15/08/2024
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	110	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	190	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	300	<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	240	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	240	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	480	<50	<50
Surrogate o-Terphenyl	%	95	93	97	91	93

svTRH (C10-C40) in Soil		
Our Reference		359034-14
Your Reference	UNITS	DUP2
Depth		-
Date Sampled		08/08/2024
Type of sample		Soil
Date extracted	-	14/08/2024
Date analysed	-	15/08/2024
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	%	90

PAHs in Soil						
Our Reference		359034-1	359034-2	359034-4	359034-5	359034-7
Your Reference	UNITS	BH15_0.1	BH17_0.1	BH18_0.25	BH19_0.1	BH20_0.2
Depth		0.1	0.1	0.25	0.1	0.2
Date Sampled		08/08/2024	08/08/2024	08/08/2024	08/08/2024	08/08/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/08/2024	14/08/2024	14/08/2024	14/08/2024	14/08/2024
Date analysed	-	15/08/2024	15/08/2024	15/08/2024	15/08/2024	15/08/2024
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.2	0.2	<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	0.1	0.2	0.08	<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	0.54	1.0	0.08	<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	%	110	108	110	107	107

PAHs in Soil						
Our Reference		359034-8	359034-10	359034-11	359034-12	359034-13
Your Reference	UNITS	BH21_0.2	BH22_0.25	BH23_0.15	BH24_0.1	BH25_0.25
Depth		0.2	0.25	0.15	0.1	0.25
Date Sampled		08/08/2024	08/08/2024	08/08/2024	08/08/2024	08/08/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/08/2024	14/08/2024	14/08/2024	14/08/2024	14/08/2024
Date analysed	-	20/08/2024	15/08/2024	15/08/2024	20/08/2024	15/08/2024
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1	0.2	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.4	0.2	0.1	0.3	0.1
Pyrene	mg/kg	0.5	0.1	<0.1	0.3	0.1
Benzo(a)anthracene	mg/kg	0.4	<0.1	<0.1	0.2	<0.1
Chrysene	mg/kg	0.3	<0.1	<0.1	0.2	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	0.6	<0.2	<0.2	0.3	<0.2
Benzo(a)pyrene	mg/kg	0.4	0.1	0.07	0.2	0.07
Indeno(1,2,3-c,d)pyrene	mg/kg	0.2	<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	0.2	<0.1	<0.1	0.1	<0.1
Total +ve PAH's	mg/kg	3.1	0.4	0.2	1.7	0.3
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	0.6	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	114	109	108	110	104

PAHs in Soil		
Our Reference		359034-14
Your Reference	UNITS	DUP2
Depth		-
Date Sampled		08/08/2024
Type of sample		Soil
Date extracted	-	14/08/2024
Date analysed	-	15/08/2024
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	0.1
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	0.1
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	0.3
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	%	108

Moisture						
Our Reference		359034-1	359034-2	359034-4	359034-5	359034-7
Your Reference	UNITS	BH15_0.1	BH17_0.1	BH18_0.25	BH19_0.1	BH20_0.2
Depth		0.1	0.1	0.25	0.1	0.2
Date Sampled		08/08/2024	08/08/2024	08/08/2024	08/08/2024	08/08/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/08/2024	14/08/2024	14/08/2024	14/08/2024	14/08/2024
Date analysed	-	15/08/2024	15/08/2024	15/08/2024	15/08/2024	15/08/2024
Moisture	%	19	6.4	23	20	26

Moisture						
Our Reference		359034-8	359034-10	359034-11	359034-12	359034-13
Your Reference	UNITS	BH21_0.2	BH22_0.25	BH23_0.15	BH24_0.1	BH25_0.25
Depth		0.2	0.25	0.15	0.1	0.25
Date Sampled		08/08/2024	08/08/2024	08/08/2024	08/08/2024	08/08/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/08/2024	14/08/2024	14/08/2024	14/08/2024	14/08/2024
Date analysed	-	15/08/2024	15/08/2024	15/08/2024	15/08/2024	15/08/2024
Moisture	%	22	24	17	19	18

Moisture		
Our Reference		359034-14
Your Reference	UNITS	DUP2
Depth		-
Date Sampled		08/08/2024
Type of sample		Soil
Date prepared	-	14/08/2024
Date analysed	-	15/08/2024
Moisture	%	19

Asbestos ID - soils NEPM - ASB-001						
Our Reference		359034-1	359034-2	359034-5	359034-8	359034-10
Your Reference	UNITS	BH15_0.1	BH17_0.1	BH19_0.1	BH21_0.2	BH22_0.25
Depth		0.1	0.1	0.1	0.2	0.25
Date Sampled		08/08/2024	08/08/2024	08/08/2024	08/08/2024	08/08/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	16/08/2024	16/08/2024	16/08/2024	16/08/2024	16/08/2024
Sample mass tested	g	556.1	640.62	638.17	439.65	469.33
Sample Description	-	Brown sandy soil & rocks	Brown sandy 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 comments	-	Nil	Nil	Nil	Nil	Nil

Asbestos ID - soils NEPM - ASB-001			
Our Reference		359034-11	359034-12
Your Reference	UNITS	BH23_0.15	BH24_0.1
Depth		0.15	0.1
Date Sampled		08/08/2024	08/08/2024
Type of sample		Soil	Soil
Date analysed	-	16/08/2024	16/08/2024
Sample mass tested	g	458.57	490.56
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected
Total Asbestos#1	g/kg	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–
FA and AF Estimation*	g	–	–
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001
Asbestos comments	-	Nil	Nil

Misc Inorg - Soil			
Our Reference		359034-5	359034-7
Your Reference	UNITS	BH19_0.1	BH20_0.2
Depth		0.1	0.2
Date Sampled		08/08/2024	08/08/2024
Type of sample		Soil	Soil
Date prepared	-	13/08/2024	13/08/2024
Date analysed	-	16/08/2024	16/08/2024
pH 1:5 soil:water	pH Units	7.8	7.9

CEC			
Our Reference		359034-5	359034-7
Your Reference	UNITS	BH19_0.1	BH20_0.2
Depth		0.1	0.2
Date Sampled		08/08/2024	08/08/2024
Type of sample		Soil	Soil
Date prepared	-	19/08/2024	19/08/2024
Date analysed	-	19/08/2024	19/08/2024
Exchangeable Ca	meq/100g	31	7.5
Exchangeable K	meq/100g	1.1	0.2
Exchangeable Mg	meq/100g	1.8	0.7
Exchangeable Na	meq/100g	<0.1	<0.1
Cation Exchange Capacity	meq/100g	33	8.4

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. NOTE#1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF relative to the sample mass tested) NOTE#2 The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation = Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.
Inorg-001	pH - Measured using pH meter and electrode. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.
Metals-020	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-OES analytical finish.
Metals-021	Determination of Mercury by Cold Vapour AAS.
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.

Method ID	Methodology Summary
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. 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.
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-4	[NT]
Date extracted	-			14/08/2024	1	14/08/2024	14/08/2024		14/08/2024	[NT]
Date analysed	-			15/08/2024	1	15/08/2024	15/08/2024		15/08/2024	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	<25	1	<25	<25	0	116	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	1	<25	<25	0	116	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	1	<0.2	<0.2	0	111	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	1	<0.5	<0.5	0	117	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	113	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	1	<2	<2	0	120	[NT]
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	118	[NT]
Naphthalene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	107	1	112	108	4	123	[NT]

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]	14	14/08/2024	14/08/2024		[NT]	[NT]
Date analysed	-			[NT]	14	15/08/2024	15/08/2024		[NT]	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	[NT]	14	<25	<25	0	[NT]	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	[NT]	14	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	[NT]	14	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	[NT]	14	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	[NT]	14	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	[NT]	14	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-023	[NT]	14	<1	<1	0	[NT]	[NT]
Naphthalene	mg/kg	1	Org-023	[NT]	14	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	14	99	108	9	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			14/08/2024	1	14/08/2024	14/08/2024		14/08/2024	[NT]
Date analysed	-			14/08/2024	1	15/08/2024	15/08/2024		15/08/2024	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	1	<50	<50	0	88	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	1	<100	<100	0	86	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	1	<100	<100	0	88	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	1	<50	<50	0	88	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	1	<100	<100	0	86	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	1	<100	<100	0	88	[NT]
Surrogate o-Terphenyl	%		Org-020	88	1	94	95	1	87	[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]	14	14/08/2024	14/08/2024		[NT]	[NT]
Date analysed	-			[NT]	14	15/08/2024	15/08/2024		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	14	<50	<50	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	14	<100	<100	0	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	14	<100	<100	0	[NT]	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	[NT]	14	<50	<50	0	[NT]	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	[NT]	14	<100	<100	0	[NT]	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	[NT]	14	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-020	[NT]	14	90	91	1	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			14/08/2024	1	14/08/2024	14/08/2024		14/08/2024	[NT]
Date analysed	-			20/08/2024	1	15/08/2024	15/08/2024		20/08/2024	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	80	[NT]
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	70	[NT]
Fluorene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	68	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	90	[NT]
Anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	1	0.2	0.1	67	92	[NT]
Pyrene	mg/kg	0.1	Org-022/025	<0.1	1	0.1	0.1	0	92	[NT]
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	74	[NT]
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	0.1	0.1	0	86	[NT]
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	106	1	110	111	1	110	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	14	14/08/2024	14/08/2024		[NT]	[NT]
Date analysed	-			[NT]	14	15/08/2024	15/08/2024		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	14	0.1	0.2	67	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-022/025	[NT]	14	0.1	0.1	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	0.1	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	14	<0.2	0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	14	0.1	0.2	67	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	14	108	104	4	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			14/08/2024	1	14/08/2024	14/08/2024		14/08/2024	[NT]
Date analysed	-			15/08/2024	1	15/08/2024	15/08/2024		15/08/2024	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	86	[NT]
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	88	[NT]
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	82	[NT]
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	88	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	94	[NT]
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	88	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	100	[NT]
Endrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	94	[NT]
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	88	[NT]
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	78	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Mirex	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	106	1	109	109	0	103	[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	14/08/2024	14/08/2024		[NT]	[NT]
Date analysed	-			[NT]	14	15/08/2024	15/08/2024		[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]
Mirex	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	[NT]	14	105	103	2	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			14/08/2024	1	14/08/2024	14/08/2024		14/08/2024	[NT]
Date analysed	-			15/08/2024	1	15/08/2024	15/08/2024		15/08/2024	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	98	[NT]
Mevinphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Phorate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Disulfoton	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Parathion-Methyl	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	80	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	68	[NT]
Malathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	80	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	82	[NT]
Fenthion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	70	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Methidathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fenamiphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	84	[NT]
Phosalone	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Coumaphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	106	1	109	109	0	103	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	14	14/08/2024	14/08/2024		[NT]	[NT]
Date analysed	-			[NT]	14	15/08/2024	15/08/2024		[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Mevinphos	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Phorate	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Disulfoton	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Parathion-Methyl	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Fenthion	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Methidathion	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Fenamiphos	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Phosalone	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Coumaphos	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	[NT]	14	105	103	2	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date prepared	-			14/08/2024	1	14/08/2024	14/08/2024		14/08/2024	[NT]
Date analysed	-			15/08/2024	1	15/08/2024	15/08/2024		15/08/2024	[NT]
Arsenic	mg/kg	4	Metals-020	<4	1	8	10	22	96	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	89	[NT]
Chromium	mg/kg	1	Metals-020	<1	1	21	25	17	90	[NT]
Copper	mg/kg	1	Metals-020	<1	1	31	48	43	91	[NT]
Lead	mg/kg	1	Metals-020	<1	1	160	270	51	92	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	0.2	67	96	[NT]
Nickel	mg/kg	1	Metals-020	<1	1	4	8	67	90	[NT]
Zinc	mg/kg	1	Metals-020	<1	1	200	240	18	96	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	14	14/08/2024	14/08/2024		[NT]	[NT]
Date analysed	-			[NT]	14	15/08/2024	15/08/2024		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	14	10	9	11	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	14	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	14	25	25	0	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	14	32	30	6	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	14	140	86	48	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	14	7	5	33	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	14	93	58	46	[NT]	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date prepared	-			13/08/2024	[NT]	[NT]	[NT]	[NT]	13/08/2024	[NT]
Date analysed	-			16/08/2024	[NT]	[NT]	[NT]	[NT]	16/08/2024	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	101	[NT]

QUALITY CONTROL: CEC						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			19/08/2024	[NT]	[NT]	[NT]	[NT]	19/08/2024	[NT]
Date analysed	-			19/08/2024	[NT]	[NT]	[NT]	[NT]	19/08/2024	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	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.

Report Comments

Acid Extractable Metals in Soil:
-The laboratory RPD acceptance criteria has been exceeded for 359034-1 for Cu,Pb and Ni. Therefore a triplicate result has been issued as laboratory sample number 359034-15.
-The laboratory RPD acceptance criteria has been exceeded for 359034-14 for Pb and Zn. Therefore a triplicate result has been issued as laboratory sample number 359034-16.

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.

CHAIN OF CUSTODY FORM - Client

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ENVIROLAB GROUP
National phone number 1300 424 344

Sydney Lab - Envirolab Services
12 Ashley St, Chatswood, NSW 2067
① 02 9910 6200 | ✉ sydney@envirolab.com.au

Perth Lab - MPL Laboratories
16-18 Hayden Crt, Myaree, WA 6154
① 08 9317 2505 | ✉ lab@mpl.com.au

Melbourne Lab - Envirolab Services
25 Research Drive, Croydon South, VIC 3136
① 03 9763 2500 | ✉ melbourne@envirolab.com.au

Adelaide Office - Envirolab Services
7a The Parade, Norwood, SA 5067
① 08 7087 6800 | ✉ adelaide@envirolab.com.au

Brisbane Office - Envirolab Services
20a, 10-20 Depot St, Banyo, QLD 4014
① 07 3266 9532 | ✉ brisbane@envirolab.com.au

Darwin Office - Envirolab Services
Unit 7, 17 Willes Rd, Berrimah, NT 0820
① 08 8967 1201 | ✉ darwin@envirolab.com.au

Client: Reditus Consulting	Client Project Name/Number/Site etc (ie report title): 24109
Contact Person: Dean Stafford	PO No.:
Project Mgr: Dean Stafford	Envirolab Quote No. :
Sampler: Tiarni Wiersma	Date results required: STANDARD
Address: Unit 1A, Level 1, 29-33 Waratah Street Kirrawee NSW	Or choose: standard / same day / 1 day / 2 day / 3 day *Note: Inform lab in advance if urgent turnaround is required - surcharges apply*
Phone: 02 9521 6567 Mob: 0487 340 857	Additional report format: esdat
Email Invoice To: accounts@reditusconsulting.com deanstafford@reditus.com.au	Lab Comments:
Email Results To: deanstafford@reditus.com.au tiarniwiersma@reditus.com.au	

already received # 358862

Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Combo 5b (fill samples)	Combo 3 (natural)	Asbestos (NEPM)	pH and Cation Exchange Capacity	HOLD	pHfox	Chromium reducible suite (Cr+)									Comments
	GBH02_6.0	6	9.08.2024						x											Provide as much information about the sample as you can
	GBH02_7.0	7	9.08.2024							x	x									
	GBH02_9.0	9	9.08.2024							x	x									
	GBH02_12.0	12	9.08.2024							x	x									
1	BH15_0.1	0.1	8.08.2024	Soil	x		x													
2	BH17_0.1	0.1	8.08.2024	Soil	x		x													
3	BH18_0.1	0.1	8.08.2024	Soil					x											
4	BH18_0.25	0.25	8.08.2024	Soil		x														
5	BH19_0.1	0.1	8.08.2024	Soil	x		x	x												
6	BH20_0.05	0.05	8.08.2024	Soil					x											
7	BH20_0.2	0.2	8.08.2024	Soil		x		x												
8	BH21_0.2	0.2	8.08.2024	Soil	x		x													
9	BH22_0.1	0.1	8.08.2024	Soil					x											
10	BH22_0.25	0.25	8.08.2024	Soil	x		x													
11	BH23_0.15	0.15	8.08.2024	Soil	x		x													
12	BH24_0.1	0.1	8.08.2024	Soil	x		x													
13	BH25_0.25	0.25	8.08.2024	Soil		x														
14	DUP2	-	8.08.2024	Soil	x															
5/6	TRIP2	-	8.08.2024	Soil	x															Please send to ALS
				Sample Count	9	3	7	2	4	3	3	0	0	0	0	0	0	0	0	

☐ *Please tick the box if observed settled sediment present in water samples is to be included in the extraction and/or analysis*

Relinquished by (Company): Reditus	Received by (Company): ELS SYD	*Lab Use Only*	
Print Name: Tiarni Wiersma	Print Name: Katy Wayne	Job number: 359034	Cooling: Ice / Ice pack / None
Date & Time: 9.08.2024	Date & Time: 9/8/24 1545	Temperature: 2°C	Security seal: Intact / Broken / None
Signature: t.wiersma	Signature:	TAT Req - SAME day / 1 / 2 / 3 / 4 / STD	

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	Reditus Consulting
Attention	Dean Stafford

Sample Login Details

Your reference	24109
Envirolab Reference	359034
Date Sample Received	09/08/2024
Date Instructions Received	13/08/2024
Date Results Expected to be Reported	20/08/2024

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	14 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	2
Cooling Method	Ice
Sampling Date Provided	YES

Comments

BH21_0.2 - Samples labelled as BH21_0.15

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:

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.

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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

CERTIFICATE OF ANALYSIS 359075

Client Details

Client	Reditus Consulting
Attention	Dean Stafford
Address	Shop 1, 29-33 Waratah St, KIRRAWEE, NSW, 2232

Sample Details

Your Reference	**24109**
Number of Samples	3 Soil, 2 Concrete
Date samples received	13/08/2024
Date completed instructions received	13/08/2024

Analysis Details

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

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

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

Report Details

Date results requested by	20/08/2024
Date of Issue	20/08/2024

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
Jenny He, Senior Chemist

Authorised By
Nancy Zhang, Laboratory Manager

coc: 09/08/24 1708

CHAIN OF CUSTODY FORM - Client

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ENVIROLAB GROUP
National phone number 1300 424 344

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.com.au

Adelaide Office - Envirolab Services
7a The Parade, Norwood, SA 5067
✆ 08 7087 6800 | ✉ adelaide@envirolab.com.au

Brisbane Office - Envirolab Services
20a, 10-20 Depot St, Banyo, QLD 4014
✆ 07 3266 9532 | ✉ brisbane@envirolab.com.au

Darwin Office - Envirolab Services
Unit 7, 17 Willes Rd, Berrimah, NT 0820
✆ 08 8967 1201 | ✉ darwin@envirolab.com.au

Client: Reditus Consulting	Client Project Name/Number/Site etc (ie report title): 24109
Contact Person: Dean Stafford	
Project Mgr: Dean Stafford	PO No.:
Sampler: Tiarni Wiersma	Envirolab Quote No. :
Address: Unit 1A, Level 1, 29-33 Waratah Street Kirrawee NSW	Date results required: STANDARD Or choose: standard / same day / 1 day / 2 day / 3 day *Note: Inform lab in advance if urgent turnaround is required - surcharges apply*
Phone: 02 9521 6567 Mob: 0487 340 857	Additional report format: esdat
Email Invoice To: accounts@reditusconsulting.com, deanstafford@reditus.com.au	Lab Comments:
Email Results To: deanstafford@reditus.com.au, tiarniwiersma@reditus.com.au	

Sample information					Tests Required														Comments
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Combo 5b (fill samples)	Combo 3 (natural)	Asbestos (NEPM)	pH and Cation Exchange Capacity	HOLD	pHfox	Chromium reducible suite (CrS)								Provide as much information about the sample as you can
1	GBH02_6.0	6	9.08.2024						X										
2	GBH02_7.0	7	9.08.2024							X	X								
3	GBH02_9.0	9	9.08.2024							X	X								
4	GBH02_12.0	12	9.08.2024							X	X								
				Sample Count					1	3	3								

Please tick the box if observed settled sediment present in water samples is to be included in the extraction and/or analysis

Relinquished by (Company): Reditus	Received by (Company): ELS SYD	Lab Use Only	
Print Name: Dean Stafford	Print Name: Katy Wayne	Job number: 358862	Cooling: Ice / Ice pack / None
Date & Time: 08/04/2024	Date & Time: 9/8/24 1545	Temperature: 4°C	Security seal: Intact / Broken / None
Signature:	Signature:	TAT Req - SAME day / 1 / 2 / 3 / 4 (STD)	

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	Reditus Consulting
Attention	Dean Stafford

Sample Login Details

Your reference	24109
Envirolab Reference	359075
Date Sample Received	13/08/2024
Date Instructions Received	13/08/2024
Date Results Expected to be Reported	20/08/2024

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	3 Soil, 2 Concrete
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	9
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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ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	Reditus Consulting
Attention	Dean Stafford

Sample Login Details

Your reference	24109
Envirolab Reference	359259
Date Sample Received	15/08/2024
Date Instructions Received	15/08/2024
Date Results Expected to be Reported	22/08/2024

Sample Condition

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

Comments

Nil

Please direct any queries to:

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

Analysis Underway, details on the following page:

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ABN 37 112 535 645
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ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	sPOCAS field test	Chromium Suite
GBH4_5.0-5	✓	✓
GBH4_10.0-10	✓	✓
GBH4_15.0-15	✓	✓

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.

vTRH(C6-C10)/BTEXN in Water						
Our Reference		359867-1	359867-2	359867-3	359867-4	359867-5
Your Reference	UNITS	MW01	MW03	MW04	DUP1	Trip Blank
Date Sampled		22/08/2024	22/08/2024	22/08/2024	22/08/2024	22/08/2024
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	23/08/2024	23/08/2024	23/08/2024	23/08/2024	23/08/2024
Date analysed	-	23/08/2024	23/08/2024	23/08/2024	23/08/2024	23/08/2024
TRH C_6 - C_9	µg/L	<10	<10	12	<10	<10
TRH C_6 - C_{10}	µg/L	11	<10	15	12	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	11	<10	15	12	<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	%	94	98	99	99	97
Surrogate Toluene-d8	%	101	101	103	101	102
Surrogate 4-Bromofluorobenzene	%	106	106	108	107	105

vTRH(C6-C10)/BTEXN in Water			
Our Reference		359867-6	359867-7
Your Reference	UNITS	Trip Spike	MW06
Date Sampled		22/08/2024	22/08/2024
Type of sample		Water	Water
Date extracted	-	23/08/2024	23/08/2024
Date analysed	-	23/08/2024	23/08/2024
TRH C_6 - C_9	µg/L	[NA]	<10
TRH C_6 - C_{10}	µg/L	[NA]	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	[NA]	<10
Benzene	µg/L	95%	<1
Toluene	µg/L	96%	<1
Ethylbenzene	µg/L	104%	<1
m+p-xylene	µg/L	105%	<2
o-xylene	µg/L	106%	<1
Naphthalene	µg/L	[NA]	<1
Surrogate Dibromofluoromethane	%	93	97
Surrogate Toluene-d8	%	102	101
Surrogate 4-Bromofluorobenzene	%	109	107

svTRH (C10-C40) in Water						
Our Reference		359867-1	359867-2	359867-3	359867-4	359867-7
Your Reference	UNITS	MW01	MW03	MW04	DUP1	MW06
Date Sampled		22/08/2024	22/08/2024	22/08/2024	22/08/2024	22/08/2024
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	27/08/2024	27/08/2024	27/08/2024	27/08/2024	27/08/2024
Date analysed	-	27/08/2024	27/08/2024	27/08/2024	27/08/2024	27/08/2024
TRH C_{10} - C_{14}	µg/L	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	µg/L	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	µg/L	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	µg/L	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16}	µg/L	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50	<50	<50	<50	<50
TRH >C_{16} - C_{34}	µg/L	<100	<100	<100	<100	<100
TRH >C_{34} - C_{40}	µg/L	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	µg/L	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	81	101	96	105	96

PAHs in Water						
Our Reference		359867-1	359867-2	359867-3	359867-4	359867-7
Your Reference	UNITS	MW01	MW03	MW04	DUP1	MW06
Date Sampled		22/08/2024	22/08/2024	22/08/2024	22/08/2024	22/08/2024
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	27/08/2024	27/08/2024	27/08/2024	27/08/2024	27/08/2024
Date analysed	-	27/08/2024	27/08/2024	27/08/2024	27/08/2024	28/08/2024
Naphthalene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
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	%	78	100	86	101	87

HM in water - dissolved						
Our Reference		359867-1	359867-2	359867-3	359867-4	359867-7
Your Reference	UNITS	MW01	MW03	MW04	DUP1	MW06
Date Sampled		22/08/2024	22/08/2024	22/08/2024	22/08/2024	22/08/2024
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	26/08/2024	26/08/2024	26/08/2024	26/08/2024	26/08/2024
Date analysed	-	26/08/2024	26/08/2024	26/08/2024	26/08/2024	26/08/2024
Arsenic-Dissolved	µg/L	5	12	<1	<1	1
Cadmium-Dissolved	µg/L	0.1	<0.1	1.1	1.2	<0.1
Chromium-Dissolved	µg/L	11	<1	<1	<1	<1
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	10	24	180	180	50
Zinc-Dissolved	µg/L	23	4	560	560	73

Method ID	Methodology Summary
Metals-021	Determination of Mercury by Cold Vapour AAS.
Metals-022	Determination of various metals by ICP-MS. Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements. Salt forms (e.g. FeO, PbO, ZnO) are determined stoichiometrically from the base metal concentration.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. 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: vTRH(C6-C10)/BTEXN in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			23/08/2024	1	23/08/2024	26/08/2024		23/08/2024	[NT]
Date analysed	-			23/08/2024	1	23/08/2024	27/08/2024		23/08/2024	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	1	<10	12	18	97	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	1	11	16	37	97	[NT]
Benzene	µg/L	1	Org-023	<1	1	<1	<1	0	92	[NT]
Toluene	µg/L	1	Org-023	<1	1	<1	<1	0	93	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	100	[NT]
m+p-xylene	µg/L	2	Org-023	<2	1	<2	<2	0	100	[NT]
o-xylene	µg/L	1	Org-023	<1	1	<1	<1	0	101	[NT]
Naphthalene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	95	1	94	97	3	96	[NT]
Surrogate Toluene-d8	%		Org-023	100	1	101	102	1	103	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	107	1	106	106	0	114	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	359867-2
Date extracted	-			27/08/2024	1	27/08/2024	27/08/2024		27/08/2024	27/08/2024
Date analysed	-			27/08/2024	1	27/08/2024	27/08/2024		27/08/2024	27/08/2024
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	1	<50	<50	0	103	114
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	1	<100	<100	0	108	115
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	1	<100	<100	0	100	103
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	1	<50	<50	0	103	114
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	1	<100	<100	0	108	115
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	1	<100	<100	0	100	103
Surrogate o-Terphenyl	%		Org-020	94	1	81	97	18	87	116

QUALITY CONTROL: PAHs in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	359867-2
Date extracted	-			27/08/2024	1	27/08/2024	27/08/2024		27/08/2024	27/08/2024
Date analysed	-			28/08/2024	1	27/08/2024	27/08/2024		27/08/2024	27/08/2024
Naphthalene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	80	92
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	83
Fluorene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	75	86
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	81	83
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	76	81
Pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	74	83
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	84	80
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	63	73
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	103	1	78	94	19	82	98

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	359867-2
Date prepared	-			26/08/2024	1	26/08/2024	26/08/2024		26/08/2024	26/08/2024
Date analysed	-			26/08/2024	1	26/08/2024	26/08/2024		26/08/2024	26/08/2024
Arsenic-Dissolved	µg/L	1	Metals-022	<1	1	5	[NT]		96	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	1	0.1	[NT]		99	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	1	11	[NT]		87	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	1	<1	[NT]		92	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	1	1	[NT]		101	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	1	<0.05	<0.05	0	119	##
Nickel-Dissolved	µg/L	1	Metals-022	<1	1	10	[NT]		90	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	1	23	[NT]		93	[NT]

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	359867-3
Date prepared	-			[NT]	2	26/08/2024	26/08/2024		[NT]	26/08/2024
Date analysed	-			[NT]	2	26/08/2024	26/08/2024		[NT]	26/08/2024
Arsenic-Dissolved	µg/L	1	Metals-022	[NT]	2	12	13	8	[NT]	98
Cadmium-Dissolved	µg/L	0.1	Metals-022	[NT]	2	<0.1	<0.1	0	[NT]	97
Chromium-Dissolved	µg/L	1	Metals-022	[NT]	2	<1	<1	0	[NT]	99
Copper-Dissolved	µg/L	1	Metals-022	[NT]	2	<1	<1	0	[NT]	92
Lead-Dissolved	µg/L	1	Metals-022	[NT]	2	<1	<1	0	[NT]	85
Mercury-Dissolved	µg/L	0.05	Metals-021	[NT]	2	<0.05	[NT]		[NT]	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	[NT]	2	24	26	8	[NT]	#
Zinc-Dissolved	µg/L	1	Metals-022	[NT]	2	4	4	0	[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 HM in water - dissolved - # 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.
-## Low spike recovery was obtained for this sample. The sample was re-digested and re-spiked and the low recovery was confirmed. This is due to matrix interferences. However, an acceptable recovery was obtained for the LCS.

COC 22/8/24, 1802

CHAIN OF CUSTODY FORM - Client

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ENVIROLAB GROUP
National phone number 1300 424 344

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.com.au

Adelaide Office - Envirolab Services
7a The Parade, Norwood, SA 5067
08 7087 6800 | adelaide@envirolab.com.au

Brisbane Office - Envirolab Services
20a, 10-20 Depot St, Banyo, QLD 4014
07 3266 9532 | brisbane@envirolab.com.au

Darwin Office - Envirolab Services
Unit 7, 17 Willes Rd, Berrimah, NT 0820
08 8967 1201 | darwin@envirolab.com.au

Client: Reditus Consulting	Client Project Name/Number/Site etc (ie report title): 24109
Contact Person: Dean Stafford	PO No.:
Project Mgr: Dean Stafford	Envirolab Quote No. :
Sampler: Tiarni Wiersma	Date results required: STANDARD (29.8.24)
Address: Unit 1A, Level 1, 29-33 Waratah Street Kirrawee NSW	Or choose: standard / ~~same day / 1 day / 2 day / 3 day~~ *Note: Inform lab in advance if urgent turnaround is required - surcharges apply*
Phone: 02 9521 6567 Mob: 0487 340 857	Additional report format: esdat
Email Invoice To: accounts@reditusconsulting.com deanstafford@reditus.com.au	Lab Comments:
Email Results To: deanstafford@reditus.com.au tiarniwiersma@reditus.com.au	

Sample Information					Tests Required														Comments
Envirolab Sample ID	Client Sample ID or Information	Depth	Date sampled	Type of sample	Combo 3	Analyse													Provide as much information about the sample as you can
1	MW01	-	22/08/2024	Water	X														
NL	MW02	-	22/08/2024	Water	X														
2	MW03	-	22/08/2024	Water	X														
3	MW04	-	22/08/2024	Water	X														
4	DUP1	-	22/08/2024	Water	X														
5/10	TRIP1	-	22/08/2024	Water	X														Please send to ALS
5	Trip blank	-	22/08/2024	Water		X													
6	trip spike	-	22/08/2024	Water		X													
7	MW06			W.															
				Sample Count	6	2	0	0	0	0	0	0	0	0	0	0	0	0	

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

Job No

Date Received
Time Received
Received By:
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

☐ *Please tick the box if observed settled sediment present in water samples is to be included in the extraction and/or analysis*

Relinquished by (Company): Reditus	Received by (Company): ALS SYD	*Lab Use Only*	
Print Name: Tiarni Wiersma	Print Name: O. WILLIAMS	Job number: 359867	Cooling: Ice / Ice pack / None
Date & Time: 22.08.24	Date & Time: 22/8/24 1830	Temperature: 2.	Security seal: Intact / Broken / None
Signature: T.Wiersma	Signature:	TAT Req - SAME day / 1 / 2 / 3 / 4 STD	

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	Reditus Consulting
Attention	Dean Stafford

Sample Login Details

Your reference	24109
Envirolab Reference	359867
Date Sample Received	22/08/2024
Date Instructions Received	22/08/2024
Date Results Expected to be Reported	29/08/2024

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	7 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	2
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

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

Analysis Underway, details on the following page:

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TRIP01	----	----	----	----
			Sampling date / time	29-Jul-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES2425194-001	--------	--------	--------	--------
				Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**26.1**	----	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**6**	----	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg	**15**	----	----	----	----
Copper	7440-50-8	5	mg/kg	**27**	----	----	----	----
Lead	7439-92-1	5	mg/kg	**38**	----	----	----	----
Nickel	7440-02-0	2	mg/kg	**10**	----	----	----	----
Zinc	7440-66-6	5	mg/kg	**33**	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	----	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	----	----	----	----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	----	----	----	----
gamma-BHC - (Lindane)	58-89-9	0.05	mg/kg	<0.05	----	----	----	----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	----	----	----	----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	----	----	----	----
Aldrin	309-00-2	0.05	mg/kg	<0.05	----	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	----	----	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	----	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	----	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	----	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	----	----	----	----
Dieldrin	60-57-1	0.05	mg/kg	<0.05	----	----	----	----
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	----	----	----	----
Endrin	72-20-8	0.05	mg/kg	<0.05	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TRIP01	----	----	----	----
				Sampling date / time	29-Jul-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2425194-001	--------	--------	--------	--------
					Result	----	----	----	----
EP068A: Organochlorine Pesticides (OC) - Continued									
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	----	----	----	----
^ **Endosulfan (sum)**	115-29-7	0.05	mg/kg		<0.05	----	----	----	----
4.4`-DDD	72-54-8	0.05	mg/kg		<0.05	----	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	----	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	----	----	----	----
4.4`-DDT	50-29-3	0.2	mg/kg		<0.2	----	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	----	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	----	----	----	----
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg		<0.05	----	----	----	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.05	mg/kg		<0.05	----	----	----	----
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		<0.05	----	----	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05	----	----	----	----
Monocrotophos	6923-22-4	0.2	mg/kg		<0.2	----	----	----	----
Dimethoate	60-51-5	0.05	mg/kg		<0.05	----	----	----	----
Diazinon	333-41-5	0.05	mg/kg		<0.05	----	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.05	----	----	----	----
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2	----	----	----	----
Malathion	121-75-5	0.05	mg/kg		<0.05	----	----	----	----
Fenthion	55-38-9	0.05	mg/kg		<0.05	----	----	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05	----	----	----	----
Parathion	56-38-2	0.2	mg/kg		<0.2	----	----	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.05	----	----	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05	----	----	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.05	----	----	----	----
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TRIP01	----	----	----	----
				Sampling date / time	29-Jul-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2425194-001	--------	--------	--------	--------
					Result	----	----	----	----
EP068B: Organophosphorus Pesticides (OP) - Continued									
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	----	----	----	----
Ethion	563-12-2	0.05	mg/kg		<0.05	----	----	----	----
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	----	----	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg		<0.5	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg		<0.5	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg		<0.5	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg		<0.5	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	----	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg		<0.5	----	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg		<0.5	----	----	----	----
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg		**0.6**	----	----	----	----
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg		**1.2**	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TRIP01	----	----	----	----
				Sampling date / time	29-Jul-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2425194-001	--------	--------	--------	--------
					Result	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons - Continued									
C10 - C14 Fraction	----	50	mg/kg		<50	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg		<100	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	----	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg		<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg		<10	----	----	----	----
>C10 - C16 Fraction	----	50	mg/kg		<50	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		<100	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	----	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg		<50	----	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg		<50	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	----	----	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	----	----	----	----
^ **Sum of BTEX**	----	0.2	mg/kg		<0.2	----	----	----	----
^ **Total Xylenes**	----	0.5	mg/kg		<0.5	----	----	----	----
Naphthalene	91-20-3	1	mg/kg		<1	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**112**	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		**89.6**	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TRIP01	----	----	----	----
				Sampling date / time	29-Jul-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2425194-001	--------	--------	--------	--------
					Result	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates - Continued									
Phenol-d6	13127-88-3	0.5	%		**87.0**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		**82.2**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		**52.2**	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**86.5**	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%		**83.8**	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		**83.8**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**95.4**	----	----	----	----
Toluene-D8	2037-26-5	0.2	%		**101**	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		**99.4**	----	----	----	----

CHAIN OF CUSTODY FORM - Client

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ENVIROLAB GROUP
National phone number 1300 424 344

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.com.au

Adelaide Office - Envirolab Services
7a The Parade, Norwood, SA 5067
08 7087 6800 | adelaide@envirolab.com.au

Brisbane Office - Envirolab Services
20a, 10-20 Depot St, Banyo, QLD 4014
07 3266 9532 | brisbane@envirolab.com.au

Darwin Office - Envirolab Services
Unit 7, 17 Willes Rd, Berrimah, NT 0820
08 8967 1201 | darwin@envirolab.com.au

Relinquished by:
ELS SYD
31/7/24 1125
KC

Client: Reditus Consulting	Client Project Name/Number/Site etc (ie report title): 24109 - Rhodes DSI
Contact Person: Dean Stafford	
Project Mgr: Dean Stafford	PO No.: 24109
Sampler: Tiarni Wiersma	Envirolab Quote No. :
Address: Unit 1A, Level 1, 29-33 Waratah Street Kirrawee NSW	Date results required: STANDARD
	Or choose: standard / same day / 1 day / 2 day / 3 day *Note: Inform lab in advance if urgent turnaround is required - surcharges apply*
Phone: 02 9521 6567 Mob: 0487 340 857	Additional report format: esdat
Email Invoice To: accounts@reditusconsulting.com deanstafford@reditus.com.au	Lab Comments:
Email Results To: deanstafford@reditus.com.au tiarniwiersma@reditus.com.au	

Environmental Division Sydney
Work Order Reference
ES2425194

Telephone : +61-2-8784 8555

	Sample Information				Tests Required																	
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Combo 5b (fill - opps)	Combo 3 (natural)	Asbestos (NEPM)	pH and Cation Exchange Capacity	HOLD													Pr ab
16	BH09_0.1	0.1	29.07.2024	Soil																		
17	BH09_0.3	0.3	29.07.2024	Soil		x																
18	BH10_0.1	0.1	29.07.2024	Soil	x		x															
19	BH10_0.3	0.3	29.07.2024	Soil					x													
20	BH11_0.05	0.05	29.07.2024	Soil					x													
21	BH11_0.2	0.2	29.07.2024	Soil	x		x															
22	BH12_0.15	0.15	29.07.2024	Soil	x		x															
23	BH13_0.1	0.1	29.07.2024	Soil					x													
24	BH13_0.25	0.25	29.07.2024	Soil	x		x															
25	BH14_0.1	0.1	29.07.2024	Soil	x		x		x													
26	BH16_0.1	0.1	29.07.2024	Soil					x													
27	BH16_0.3	0.3	29.07.2024	Soil		x																
28	DUP01	-	29.07.2024	Soil	x																	
30	TRIP01	-	29.07.2024	Soil	x																	
																					Please Forward to ALS	
				Sample Count	7	2	5		5													

Please tick the box if observed settled sediment present in water samples is to be included in the extraction and/or analysis

Relinquished by (Company): Reditus	Received by (Company):	Lab Use Only	
Print Name: Tiarni Wiersma	Print Name: CH.	Job number: 357812	Cooling: Ice / Ice pack / None
Date & Time: 30.07.2024	Date & Time: 30/7/24 0930	Temperature: 3°C	Security seal: Intact / Broken / None
Signature: T.Wiersma	Signature:	TAT Req - SAME day / 1 / 2 / 3 / 4 / STD	

Rec: 31/7/24 1435

#357812

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **ES2425194**

Client	: **REDITUS CONSULTING PTY LTD.**	Laboratory	: Environmental Division Sydney
Contact	: Dean Stafford	Contact	: Customer Services ES
Address	: 1A/29-33 Waratah Street KIRRAWEE	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: deanstafford@reditus.com.au	E-mail	: ALSEnviro.Sydney@ALSGlobal.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 24109- Rhodes DSI	Page	: 1 of 2
Order number	: 24109	Quote number	: EP2023REDITUS0001 (EN/333)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	:		
Sampler	: TIARNI WIERSMA		

Dates

Date Samples Received	: 31-Jul-2024 14:35	Issue Date	: 01-Aug-2024
Client Requested Due Date	: 07-Aug-2024	Scheduled Reporting Date	: **07-Aug-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 7.4'C - Ice Bricks present
Receipt Detail	:	No. of samples received / analysed	: 1 / 1

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Unless otherwise stated, analytical work for this work order will be conducted at ALS Sydney, NATA accreditation no. 825, site no. 10911.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

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

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - S-12 OC/OP Pesticides	SOIL - S-26 8 metals/TRH/BTEXN/PAH
ES2425194-001	29-Jul-2024 00:00	TRIP01	✓	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

ACCOUNTS		
- A4 - AU Tax Invoice (INV)	Email	accounts@reditusconsulting.com
Dean Stafford		
- *AU Certificate of Analysis - NATA (COA)	Email	deanstafford@reditus.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	deanstafford@reditus.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	deanstafford@reditus.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	deanstafford@reditus.com.au
- A4 - AU Tax Invoice (INV)	Email	deanstafford@reditus.com.au
- Chain of Custody (CoC) (COC)	Email	deanstafford@reditus.com.au
- EDI Format - ENMRG (ENMRG)	Email	deanstafford@reditus.com.au
- EDI Format - ESDAT (ESDAT)	Email	deanstafford@reditus.com.au
Esdat Deliverables		
- EDI Format - ESDAT (ESDAT)	Email	reditusconsulting@esdat.com.au
TIARNI WIERSMA		
- *AU Certificate of Analysis - NATA (COA)	Email	tiarniwiersma@reditus.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	tiarniwiersma@reditus.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	tiarniwiersma@reditus.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	tiarniwiersma@reditus.com.au
- Chain of Custody (CoC) (COC)	Email	tiarniwiersma@reditus.com.au
- EDI Format - ENMRG (ENMRG)	Email	tiarniwiersma@reditus.com.au
- EDI Format - ESDAT (ESDAT)	Email	tiarniwiersma@reditus.com.au

QUALITY CONTROL REPORT

Work Order	: **ES2425194**	Page	: 1 of 10
Client	: **REDITUS CONSULTING PTY LTD.**	Laboratory	: Environmental Division Sydney
Contact	: Dean Stafford	Contact	: Customer Services ES
Address	: 1A/29-33 Waratah Street KIRRAWEE	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 24109- Rhodes DSI	Date Samples Received	: 31-Jul-2024
Order number	: 24109	Date Analysis Commenced	: 02-Aug-2024
C-O-C number	: ----	Issue Date	: 07-Aug-2024
Sampler	: TIARNI WIERSMA		
Site	:		
Quote number	: EN/333		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 5966795)									
ES2425194-001	TRIP01	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	15	16	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	10	9	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	6	5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	27	28	5.1	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	38	47	21.5	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	33	38	14.1	No Limit
ES2425223-018	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	6	7	14.9	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5966798)									
ES2425210-002	Anonymous	EA055: Moisture Content	----	0.1 (1.0)*	%	12.6	13.3	4.9	0% - 50%
ES2425223-021	Anonymous	EA055: Moisture Content	----	0.1 (1.0)*	%	14.6	15.0	2.8	0% - 50%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 5966794)									
ES2425194-001	TRIP01	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES2425223-018	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 5963927) - continued									
ES2425195-001	Anonymous	EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 5963925)									
ES2425195-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5963926)									
ES2425195-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5964772)									
ES2425022-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES2425022-014	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5963926)									
ES2425195-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5964772)									
ES2425022-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5964772) - continued									
ES2425022-014	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080: BTEXN (QC Lot: 5964772)									
ES2425022-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES2425022-014	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5966795)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	121.1 mg/kg	96.4	88.0	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	0.74 mg/kg	103	70.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	19.6 mg/kg	117	68.0	132
EG005T: Copper	7440-50-8	5	mg/kg	<5	52.9 mg/kg	97.5	89.0	111
EG005T: Lead	7439-92-1	5	mg/kg	<5	60.8 mg/kg	96.5	82.0	119
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.3 mg/kg	99.7	80.0	120
EG005T: Zinc	7440-66-6	5	mg/kg	<5	139.3 mg/kg	92.8	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5966794)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.087 mg/kg	98.3	70.0	125
EP068A: Organochlorine Pesticides (OC) (QCLot: 5963927)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	84.7	69.0	113
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	83.1	65.0	117
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	78.9	67.0	119
EP068: gamma-BHC - (Lindane)	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	92.1	68.0	116
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	76.7	65.0	117
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	78.4	67.0	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	85.7	69.0	115
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	82.7	62.0	118
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	83.2	63.0	117
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	85.2	66.0	116
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	86.8	64.0	116
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	92.2	66.0	116
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	89.4	67.0	115
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	102	67.0	123
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	82.3	69.0	115
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	78.7	69.0	121
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	91.6	56.0	120
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	91.5	62.0	124
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	81.2	66.0	120
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	89.6	64.0	122

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP068A: Organochlorine Pesticides (OC) (QCLot: 5963927) - continued								
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	76.2	54.0	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 5963927)								
EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	0.5 mg/kg	88.7	59.0	119
EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	88.5	62.0	128
EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	0.5 mg/kg	75.2	54.0	126
EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	0.5 mg/kg	79.0	67.0	119
EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	0.5 mg/kg	83.9	70.0	120
EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	0.5 mg/kg	79.6	72.0	120
EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	0.5 mg/kg	75.5	68.0	120
EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	0.5 mg/kg	74.2	68.0	122
EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	0.5 mg/kg	78.4	69.0	117
EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	0.5 mg/kg	93.4	76.0	118
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	0.5 mg/kg	104	64.0	122
EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	0.5 mg/kg	82.2	70.0	116
EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	0.5 mg/kg	85.9	69.0	121
EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	0.5 mg/kg	84.0	66.0	118
EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	0.5 mg/kg	84.6	68.0	124
EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	0.5 mg/kg	84.4	62.0	112
EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	0.5 mg/kg	79.2	68.0	120
EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	0.5 mg/kg	88.3	65.0	127
EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	0.5 mg/kg	52.9	41.0	123
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 5963925)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	94.5	77.0	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	97.4	72.0	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	91.3	73.0	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	97.4	72.0	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	97.2	75.0	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	97.0	77.0	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	96.9	73.0	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	97.3	74.0	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	93.6	69.0	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	98.5	75.0	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	97.1	68.0	116

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 5963925) - continued								
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	96.1	74.0	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	93.0	70.0	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	89.4	61.0	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	84.2	62.0	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	90.8	63.0	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5963926)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	104	75.0	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	107	77.0	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	110	71.0	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5964772)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	114	72.2	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5963926)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	107	77.0	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	106	74.0	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	109	63.0	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5964772)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	112	72.4	133
EP080: BTEXN (QCLot: 5964772)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	105	76.0	124
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	115	78.5	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	103	77.4	121
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	111	78.2	121
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	114	81.3	121
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	109	78.8	122

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5966795)							
ES2425194-001	TRIP01	EG005T: Arsenic	7440-38-2	50 mg/kg	96.3	70.0	130

Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055)							
TRIP01	29-Jul-2024	----	----	----	04-Aug-2024	12-Aug-2024	✓
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
TRIP01	29-Jul-2024	04-Aug-2024	25-Jan-2025	✓	07-Aug-2024	25-Jan-2025	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T)							
TRIP01	29-Jul-2024	04-Aug-2024	26-Aug-2024	✓	07-Aug-2024	26-Aug-2024	✓
EP068A: Organochlorine Pesticides (OC)							
Soil Glass Jar - Unpreserved (EP068)							
TRIP01	29-Jul-2024	02-Aug-2024	12-Aug-2024	✓	02-Aug-2024	11-Sep-2024	✓
EP068B: Organophosphorus Pesticides (OP)							
Soil Glass Jar - Unpreserved (EP068)							
TRIP01	29-Jul-2024	02-Aug-2024	12-Aug-2024	✓	02-Aug-2024	11-Sep-2024	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM))							
TRIP01	29-Jul-2024	02-Aug-2024	12-Aug-2024	✓	02-Aug-2024	11-Sep-2024	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP071)							
TRIP01	29-Jul-2024	02-Aug-2024	12-Aug-2024	✓	03-Aug-2024	11-Sep-2024	✓
Soil Glass Jar - Unpreserved (EP080)							
TRIP01	29-Jul-2024	02-Aug-2024	12-Aug-2024	✓	05-Aug-2024	12-Aug-2024	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP071)							
TRIP01	29-Jul-2024	02-Aug-2024	12-Aug-2024	✓	03-Aug-2024	11-Sep-2024	✓
Soil Glass Jar - Unpreserved (EP080)							
TRIP01	29-Jul-2024	02-Aug-2024	12-Aug-2024	✓	05-Aug-2024	12-Aug-2024	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080)							
TRIP01	29-Jul-2024	02-Aug-2024	12-Aug-2024	✓	05-Aug-2024	12-Aug-2024	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	8	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	8	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	8	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3)
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270 Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM Schedule B(3).
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015 Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM Schedule B(3).
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM Schedule B(3) amended.

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM Schedule B(3).
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

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NATA Laboratory Reports

ALS ES2426839
Field Triplicate • Soil

CERTIFICATE OF ANALYSIS

Work Order	: **ES2426839**	Page	: 1 of 8
Client	: **REDITUS CONSULTING PTY LTD.**	Laboratory	: Environmental Division Sydney
Contact	: Dean Stafford	Contact	: Customer Services ES
Address	: 1A/29-33 Waratah Street KIRRAWEE	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 24109	Date Samples Received	: 14-Aug-2024 15:00
Order number	: ----	Date Analysis Commenced	: 19-Aug-2024
C-O-C number	: ----	Issue Date	: 21-Aug-2024 18:07
Sampler	: TIARNI WIERSMA		
Site	:		
Quote number	: EN/333		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TRIP2	----	----	----	----
			Sampling date / time	08-Aug-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES2426839-001	--------	--------	--------	--------
				Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**19.6**	----	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**11**	----	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg	**33**	----	----	----	----
Copper	7440-50-8	5	mg/kg	**42**	----	----	----	----
Lead	7439-92-1	5	mg/kg	**39**	----	----	----	----
Nickel	7440-02-0	2	mg/kg	**11**	----	----	----	----
Zinc	7440-66-6	5	mg/kg	**196**	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	----	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	----	----	----	----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	----	----	----	----
gamma-BHC - (Lindane)	58-89-9	0.05	mg/kg	<0.05	----	----	----	----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	----	----	----	----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	----	----	----	----
Aldrin	309-00-2	0.05	mg/kg	<0.05	----	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	----	----	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	----	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	----	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	----	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	----	----	----	----
Dieldrin	60-57-1	0.05	mg/kg	<0.05	----	----	----	----
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	----	----	----	----
Endrin	72-20-8	0.05	mg/kg	<0.05	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TRIP2	----	----	----	----
				Sampling date / time	08-Aug-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2426839-001	--------	--------	--------	--------
					Result	----	----	----	----
EP068A: Organochlorine Pesticides (OC) - Continued									
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	----	----	----	----
^ **Endosulfan (sum)**	115-29-7	0.05	mg/kg		<0.05	----	----	----	----
4.4`-DDD	72-54-8	0.05	mg/kg		<0.05	----	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	----	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	----	----	----	----
4.4`-DDT	50-29-3	0.2	mg/kg		<0.2	----	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	----	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	----	----	----	----
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg		<0.05	----	----	----	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.05	mg/kg		<0.05	----	----	----	----
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		<0.05	----	----	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05	----	----	----	----
Monocrotophos	6923-22-4	0.2	mg/kg		<0.2	----	----	----	----
Dimethoate	60-51-5	0.05	mg/kg		<0.05	----	----	----	----
Diazinon	333-41-5	0.05	mg/kg		<0.05	----	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.05	----	----	----	----
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2	----	----	----	----
Malathion	121-75-5	0.05	mg/kg		<0.05	----	----	----	----
Fenthion	55-38-9	0.05	mg/kg		<0.05	----	----	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05	----	----	----	----
Parathion	56-38-2	0.2	mg/kg		<0.2	----	----	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.05	----	----	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05	----	----	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.05	----	----	----	----
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TRIP2	----	----	----	----
				Sampling date / time	08-Aug-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2426839-001	--------	--------	--------	--------
					Result	----	----	----	----
EP068B: Organophosphorus Pesticides (OP) - Continued									
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	----	----	----	----
Ethion	563-12-2	0.05	mg/kg		<0.05	----	----	----	----
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	----	----	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg		<0.5	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg		<0.5	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg		<0.5	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg		<0.5	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	----	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg		<0.5	----	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg		<0.5	----	----	----	----
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg		**0.6**	----	----	----	----
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg		**1.2**	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TRIP2	----	----	----	----
				Sampling date / time	08-Aug-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2426839-001	--------	--------	--------	--------
					Result	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons - Continued									
C10 - C14 Fraction	----	50	mg/kg		<50	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg		<100	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	----	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg		<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg		<10	----	----	----	----
>C10 - C16 Fraction	----	50	mg/kg		<50	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		<100	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	----	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg		<50	----	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg		<50	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	----	----	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	----	----	----	----
^ **Sum of BTEX**	----	0.2	mg/kg		<0.2	----	----	----	----
^ **Total Xylenes**	----	0.5	mg/kg		<0.5	----	----	----	----
Naphthalene	91-20-3	1	mg/kg		<1	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**124**	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		**129**	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TRIP2	----	----	----	----
				Sampling date / time	08-Aug-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2426839-001	--------	--------	--------	--------
					Result	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates - Continued									
Phenol-d6	13127-88-3	0.5	%		**84.2**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		**86.0**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		**74.4**	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**86.4**	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%		**86.7**	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		**83.1**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**92.4**	----	----	----	----
Toluene-D8	2037-26-5	0.2	%		**93.7**	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		**97.8**	----	----	----	----

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **ES2426839**

Client	: **REDITUS CONSULTING PTY LTD.**	Laboratory	: Environmental Division Sydney
Contact	: Dean Stafford	Contact	: Customer Services ES
Address	: 1A/29-33 Waratah Street KIRRAWEE	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: deanstafford@reditus.com.au	E-mail	: ALSEnviro.Sydney@ALSGlobal.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 24109	Page	: 1 of 2
Order number	: ----	Quote number	: EP2023REDITUS0001 (EN/333)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	:		
Sampler	: TIARNI WIERSMA		

Dates

Date Samples Received	: 14-Aug-2024 15:00	Issue Date	: 16-Aug-2024
Client Requested Due Date	: 21-Aug-2024	Scheduled Reporting Date	: **21-Aug-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 11.3'C, 11.2'C, 10'C - Ice Bricks present
Receipt Detail	:	No. of samples received / analysed	: 1 / 1

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Unless otherwise stated, analytical work for this work order will be conducted at ALS Sydney, NATA accreditation no. 825, site no. 10911.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

QUALITY CONTROL REPORT

Work Order	: **ES2426839**	Page	: 1 of 11
Client	: **REDITUS CONSULTING PTY LTD.**	Laboratory	: Environmental Division Sydney
Contact	: Dean Stafford	Contact	: Customer Services ES
Address	: 1A/29-33 Waratah Street KIRRAWEE	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 24109	Date Samples Received	: 14-Aug-2024
Order number	: ----	Date Analysis Commenced	: 19-Aug-2024
C-O-C number	: ----	Issue Date	: 21-Aug-2024
Sampler	: TIARNI WIERSMA		
Site	:		
Quote number	: EN/333		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 5997244)									
ES2426839-001	TRIP2	EG005T: Lead	7439-92-1	5	mg/kg	39	28	32.8	No Limit
ES2426839-001	TRIP2	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	33	34	5.1	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	11	11	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	11	11	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	42	29	34.8	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	196	169	14.8	0% - 20%
ES2426842-010	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	7	7	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	2	2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	8	9	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	13	13	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	58	58	0.0	0% - 50%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5997248)									
ES2426842-002	Anonymous	EA055: Moisture Content	----	0.1 (1.0)*	%	17.7	18.1	2.2	0% - 50%
ES2426875-003	Anonymous	EA055: Moisture Content	----	0.1 (1.0)*	%	27.0	26.0	3.9	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 5997245)									
ES2426839-001	TRIP2	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES2426842-010	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP068A: Organochlorine Pesticides (OC) (QC Lot: 5995548)									
ES2426828-001	Anonymous	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC - (Lindane)	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
ES2426875-021	Anonymous	EP068: alpha-BHC	319-84-6	0.05 (0.25)*	mg/kg	<0.25	<0.25	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05 (0.25)*	mg/kg	<0.25	<0.25	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05 (0.25)*	mg/kg	<0.25	<0.25	0.0	No Limit
		EP068: gamma-BHC - (Lindane)	58-89-9	0.05 (0.25)*	mg/kg	<0.25	<0.25	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05 (0.25)*	mg/kg	<0.25	<0.25	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05 (0.25)*	mg/kg	<0.25	<0.25	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05 (0.25)*	mg/kg	<0.25	<0.25	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05 (0.25)*	mg/kg	<0.25	<0.25	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05 (0.25)*	mg/kg	<0.25	<0.25	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05 (0.25)*	mg/kg	<0.25	<0.25	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05 (0.25)*	mg/kg	<0.25	<0.25	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05 (0.25)*	mg/kg	<0.25	<0.25	0.0	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05 (0.25)*	mg/kg	<0.25	<0.25	0.0	No Limit
		EP068: Endrin	72-20-8	0.05 (0.25)*	mg/kg	<0.25	<0.25	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05 (0.25)*	mg/kg	<0.25	<0.25	0.0	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05 (0.25)*	mg/kg	<0.25	<0.25	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05 (0.25)*	mg/kg	<0.25	<0.25	0.0	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP068A: Organochlorine Pesticides (OC) (QC Lot: 5995548) - continued									
ES2426875-021	Anonymous	EP068: Endosulfan sulfate	1031-07-8	0.05 (0.25)*	mg/kg	<0.25	<0.25	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05 (0.25)*	mg/kg	<0.25	<0.25	0.0	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2 (1.0)*	mg/kg	<1.0	<1.0	0.0	No Limit
		EP068: Methoxychlor	72-43-5	0.2 (1.0)*	mg/kg	<1.0	<1.0	0.0	No Limit
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 5995548)									
ES2426828-001	Anonymous	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
ES2426875-021	Anonymous	EP068: Dichlorvos	62-73-7	0.05 (0.25)*	mg/kg	<0.25	<0.25	0.0	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05 (0.25)*	mg/kg	<0.25	<0.25	0.0	No Limit
		EP068: Dimethoate	60-51-5	0.05 (0.25)*	mg/kg	<0.25	<0.25	0.0	No Limit
		EP068: Diazinon	333-41-5	0.05 (0.25)*	mg/kg	<0.25	<0.25	0.0	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05 (0.25)*	mg/kg	<0.25	<0.25	0.0	No Limit
		EP068: Malathion	121-75-5	0.05 (0.25)*	mg/kg	<0.25	<0.25	0.0	No Limit
		EP068: Fenthion	55-38-9	0.05 (0.25)*	mg/kg	<0.25	<0.25	0.0	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05 (0.25)*	mg/kg	<0.25	<0.25	0.0	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05 (0.25)*	mg/kg	<0.25	<0.25	0.0	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05 (0.25)*	mg/kg	<0.25	<0.25	0.0	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05 (0.25)*	mg/kg	<0.25	<0.25	0.0	No Limit
		EP068: Fenamiphos	22224-92-6	0.05 (0.25)*	mg/kg	<0.25	<0.25	0.0	No Limit
		EP068: Prothiofos	34643-46-4	0.05 (0.25)*	mg/kg	<0.25	<0.25	0.0	No Limit
		EP068: Ethion	563-12-2	0.05 (0.25)*	mg/kg	<0.25	<0.25	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 5995548) - continued									
ES2426875-021	Anonymous	EP068: Carbophenothion	786-19-6	0.05 (0.25)*	mg/kg	<0.25	<0.25	0.0	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05 (0.25)*	mg/kg	<0.25	<0.25	0.0	No Limit
		EP068: Monocrotophos	6923-22-4	0.2 (1.0)*	mg/kg	<1.0	<1.0	0.0	No Limit
		EP068: Parathion-methyl	298-00-0	0.2 (1.0)*	mg/kg	<1.0	<1.0	0.0	No Limit
		EP068: Parathion	56-38-2	0.2 (1.0)*	mg/kg	<1.0	<1.0	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 5995546)									
ES2426875-021	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	0.6	0.8	25.8	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	0.6	0.8	28.6	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5995547)									
ES2426828-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES2426875-021	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	820	810	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	890	900	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5996587)									
ES2426593-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES2426842-002	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5995547)									

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5995547) - continued									
ES2426828-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES2426875-021	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	1530	1470	4.0	0% - 50%
		EP071: >C34 - C40 Fraction	----	100	mg/kg	600	560	5.6	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5996587)									
ES2426593-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES2426842-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080: BTEXN (QC Lot: 5996587)									
ES2426593-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES2426842-002	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5997244)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	121.1 mg/kg	107	88.0	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	0.74 mg/kg	117	70.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	19.6 mg/kg	126	68.0	132
EG005T: Copper	7440-50-8	5	mg/kg	<5	52.9 mg/kg	107	89.0	111
EG005T: Lead	7439-92-1	5	mg/kg	<5	60.8 mg/kg	118	82.0	119
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.3 mg/kg	113	80.0	120
EG005T: Zinc	7440-66-6	5	mg/kg	<5	139.3 mg/kg	105	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5997245)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.087 mg/kg	99.2	70.0	125
EP068A: Organochlorine Pesticides (OC) (QCLot: 5995548)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	85.6	69.0	113
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	94.4	65.0	117
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	94.6	67.0	119
EP068: gamma-BHC - (Lindane)	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	94.5	68.0	116
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	91.7	65.0	117
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	91.7	67.0	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	95.6	69.0	115
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	92.9	62.0	118
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	92.6	63.0	117
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	95.7	66.0	116
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	91.4	64.0	116
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	94.8	66.0	116
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	94.1	67.0	115
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	96.0	67.0	123
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	102	69.0	115
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	95.7	69.0	121
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	84.1	56.0	120
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	95.2	62.0	124
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	85.0	66.0	120
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	92.7	64.0	122

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP068A: Organochlorine Pesticides (OC) (QCLot: 5995548) - continued								
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	82.7	54.0	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 5995548)								
EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	0.5 mg/kg	85.0	59.0	119
EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	92.4	62.0	128
EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	0.5 mg/kg	74.0	54.0	126
EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	0.5 mg/kg	95.5	67.0	119
EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	0.5 mg/kg	98.1	70.0	120
EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	0.5 mg/kg	93.7	72.0	120
EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	0.5 mg/kg	80.8	68.0	120
EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	0.5 mg/kg	91.2	68.0	122
EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	0.5 mg/kg	92.9	69.0	117
EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	0.5 mg/kg	97.5	76.0	118
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	0.5 mg/kg	77.2	64.0	122
EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	0.5 mg/kg	92.5	70.0	116
EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	0.5 mg/kg	89.9	69.0	121
EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	0.5 mg/kg	93.0	66.0	118
EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	0.5 mg/kg	84.6	68.0	124
EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	0.5 mg/kg	91.9	62.0	112
EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	0.5 mg/kg	94.1	68.0	120
EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	0.5 mg/kg	95.8	65.0	127
EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	0.5 mg/kg	77.6	41.0	123
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 5995546)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	82.5	77.0	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	86.5	72.0	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	90.7	73.0	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	89.3	72.0	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	100	75.0	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	105	77.0	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	101	73.0	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	102	74.0	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	76.8	69.0	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	79.0	75.0	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	74.4	68.0	116

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 5995546) - continued								
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	84.0	74.0	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	75.4	70.0	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	79.9	61.0	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	75.9	62.0	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	76.6	63.0	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5995547)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	103	75.0	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	104	77.0	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	102	71.0	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5996587)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	109	72.2	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5995547)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	107	77.0	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	95.2	74.0	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	78.1	63.0	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5996587)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	99.8	72.4	133
EP080: BTEXN (QCLot: 5996587)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	109	76.0	124
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	107	78.5	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	101	77.4	121
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	107	78.2	121
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	102	81.3	121
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	99.1	78.8	122

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5997244)							
ES2426839-001	TRIP2	EG005T: Arsenic	7440-38-2	50 mg/kg	84.7	70.0	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5997244) - continued							
ES2426839-001	TRIP2	EG005T: Cadmium	7440-43-9	50 mg/kg	98.5	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	74.3	68.0	132
		EG005T: Copper	7440-50-8	250 mg/kg	96.2	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	94.2	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	104	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	104	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5997245)							
ES2426839-001	TRIP2	EG035T: Mercury	7439-97-6	5 mg/kg	85.9	70.0	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 5995548)							
ES2426875-021	Anonymous	EP068: gamma-BHC - (Lindane)	58-89-9	0.5 mg/kg	110	70.0	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	87.1	70.0	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	90.6	70.0	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	97.7	70.0	130
		EP068: Endrin	72-20-8	2 mg/kg	87.3	70.0	130
		EP068: 4.4`-DDT	50-29-3	2 mg/kg	79.8	70.0	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 5995548)							
ES2426875-021	Anonymous	EP068: Diazinon	333-41-5	0.5 mg/kg	93.5	70.0	130
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	77.6	70.0	130
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	75.4	70.0	130
		EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	83.5	70.0	130
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	91.1	70.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 5995546)							
ES2426875-021	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	76.6	70.0	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	91.8	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5995547)							
ES2426875-021	Anonymous	EP071: C10 - C14 Fraction	----	480 mg/kg	117	73.0	137
		EP071: C15 - C28 Fraction	----	3100 mg/kg	115	53.0	131
		EP071: C29 - C36 Fraction	----	2060 mg/kg	131	52.0	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5996587)							
ES2426593-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	99.0	60.4	142
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5995547)							
ES2426875-021	Anonymous	EP071: >C10 - C16 Fraction	----	860 mg/kg	112	73.0	137
		EP071: >C16 - C34 Fraction	----	4320 mg/kg	128	53.0	131
		EP071: >C34 - C40 Fraction	----	890 mg/kg	121	52.0	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5996587)							
ES2426593-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	94.4	61.1	142

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP080: BTEXN (QCLot: 5996587)							
ES2426593-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	92.2	62.1	122
		EP080: Toluene	108-88-3	2.5 mg/kg	95.5	66.6	119
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	92.3	67.4	123
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	96.5	66.4	121
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	95.3	70.7	121
		EP080: Naphthalene	91-20-3	2.5 mg/kg	95.4	61.1	115

Sample Container(s)/Preservation Non-Compliances

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

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - S-12 OC/OP Pesticides	SOIL - S-26 8 metals/TRH/BTEXN/PAH
ES2426839-001	08-Aug-2024 00:00	TRIP2	✓	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

ACCOUNTS		
- A4 - AU Tax Invoice (INV)	Email	accounts@reditusconsulting.com
Dean Stafford		
- *AU Certificate of Analysis - NATA (COA)	Email	deanstafford@reditus.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	deanstafford@reditus.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	deanstafford@reditus.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	deanstafford@reditus.com.au
- A4 - AU Tax Invoice (INV)	Email	deanstafford@reditus.com.au
- Chain of Custody (CoC) (COC)	Email	deanstafford@reditus.com.au
- EDI Format - ENMRG (ENMRG)	Email	deanstafford@reditus.com.au
- EDI Format - ESDAT (ESDAT)	Email	deanstafford@reditus.com.au
Esdat Deliverables		
- EDI Format - ESDAT (ESDAT)	Email	reditusconsulting@esdat.com.au
TIARNI WIERSMA		
- *AU Certificate of Analysis - NATA (COA)	Email	tiarniwiersma@reditus.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	tiarniwiersma@reditus.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	tiarniwiersma@reditus.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	tiarniwiersma@reditus.com.au
- Chain of Custody (CoC) (COC)	Email	tiarniwiersma@reditus.com.au
- EDI Format - ENMRG (ENMRG)	Email	tiarniwiersma@reditus.com.au
- EDI Format - ESDAT (ESDAT)	Email	tiarniwiersma@reditus.com.au

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2426839**	Page	: 1 of 4
Client	: **REDITUS CONSULTING PTY LTD.**	Laboratory	: Environmental Division Sydney
Contact	: Dean Stafford	Telephone	: +61-2-8784 8555
Project	: 24109	Date Samples Received	: 14-Aug-2024
Site	:	Issue Date	: 21-Aug-2024
Sampler	: TIARNI WIERSMA	No. of samples received	: 1
Order number	: ----	No. of samples analysed	: 1

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055)							
TRIP2	**08-Aug-2024**	**----**	----	----	**19-Aug-2024**	22-Aug-2024	✓
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
TRIP2	**08-Aug-2024**	**19-Aug-2024**	04-Feb-2025	✓	**20-Aug-2024**	04-Feb-2025	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T)							
TRIP2	**08-Aug-2024**	**19-Aug-2024**	05-Sep-2024	✓	**21-Aug-2024**	05-Sep-2024	✓
EP068A: Organochlorine Pesticides (OC)							
Soil Glass Jar - Unpreserved (EP068)							
TRIP2	**08-Aug-2024**	**19-Aug-2024**	22-Aug-2024	✓	**20-Aug-2024**	28-Sep-2024	✓
EP068B: Organophosphorus Pesticides (OP)							
Soil Glass Jar - Unpreserved (EP068)							
TRIP2	**08-Aug-2024**	**19-Aug-2024**	22-Aug-2024	✓	**20-Aug-2024**	28-Sep-2024	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM))							
TRIP2	**08-Aug-2024**	**19-Aug-2024**	22-Aug-2024	✓	**19-Aug-2024**	28-Sep-2024	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080)							
TRIP2	**08-Aug-2024**	**19-Aug-2024**	22-Aug-2024	✓	**19-Aug-2024**	22-Aug-2024	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP080)							
TRIP2	**08-Aug-2024**	**19-Aug-2024**	22-Aug-2024	✓	**19-Aug-2024**	22-Aug-2024	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080)							
TRIP2	**08-Aug-2024**	**19-Aug-2024**	22-Aug-2024	✓	**19-Aug-2024**	22-Aug-2024	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	10	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	3	20	**15.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3)
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270 Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM Schedule B(3).
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015 Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM Schedule B(3).
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM Schedule B(3) amended.

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM Schedule B(3).
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

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NATA Laboratory Reports

ALS ES2427802
Field Triplicate • Groundwater

CERTIFICATE OF ANALYSIS

Work Order	: **ES2427802**	Page	: 1 of 6
Client	: **REDITUS CONSULTING PTY LTD.**	Laboratory	: Environmental Division Sydney
Contact	: Dean Stafford	Contact	: Customer Services ES
Address	: 1A/29-33 Waratah Street KIRRAWEE	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 24109	Date Samples Received	: 23-Aug-2024 17:40
Order number	: ----	Date Analysis Commenced	: 26-Aug-2024
C-O-C number	: ----	Issue Date	: 30-Aug-2024 22:03
Sampler	: TIARNI WIERSMA		
Site	:		
Quote number	: EN/333		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW

General Comments

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

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

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

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

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

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

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

- EP075 (SIM): Where reported, Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	TRIP1	----	----	----	----
				Sampling date / time	22-Aug-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2427802-001	--------	--------	--------	--------
					Result	----	----	----	----
EG020F: Dissolved Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		**0.0010**	----	----	----	----
Chromium	7440-47-3	0.001	mg/L		<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L		<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		**0.181**	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		**0.520**	----	----	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L		<1.0	----	----	----	----
Acenaphthylene	208-96-8	1.0	µg/L		<1.0	----	----	----	----
Acenaphthene	83-32-9	1.0	µg/L		<1.0	----	----	----	----
Fluorene	86-73-7	1.0	µg/L		<1.0	----	----	----	----
Phenanthrene	85-01-8	1.0	µg/L		<1.0	----	----	----	----
Anthracene	120-12-7	1.0	µg/L		<1.0	----	----	----	----
Fluoranthene	206-44-0	1.0	µg/L		<1.0	----	----	----	----
Pyrene	129-00-0	1.0	µg/L		<1.0	----	----	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L		<1.0	----	----	----	----
Chrysene	218-01-9	1.0	µg/L		<1.0	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L		<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L		<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L		<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L		<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L		<1.0	----	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	µg/L		<0.5	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	TRIP1	----	----	----	----
				Sampling date / time	22-Aug-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2427802-001	--------	--------	--------	--------
					Result	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L		<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L		**190**	----	----	----	----
C29 - C36 Fraction	----	50	µg/L		<50	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		**190**	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		**200**	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		**200**	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	----	----	----	----
Toluene	108-88-3	2	µg/L		<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	----	----	----	----
^ Total Xylenes	----	2	µg/L		<2	----	----	----	----
^ Sum of BTEX	----	1	µg/L		<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%		**25.2**	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	TRIP1	----	----	----	----
				Sampling date / time	22-Aug-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2427802-001	--------	--------	--------	--------
					Result	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates - Continued									
2-Chlorophenol-D4	93951-73-6	1.0	%		**55.8**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	1.0	%		**70.3**	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%		**76.3**	----	----	----	----
Anthracene-d10	1719-06-8	1.0	%		**87.8**	----	----	----	----
4-Terphenyl-d14	1718-51-0	1.0	%		**85.4**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**92.8**	----	----	----	----
Toluene-D8	2037-26-5	2	%		**98.2**	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**107**	----	----	----	----

QUALITY CONTROL REPORT

Work Order	: **ES2427802**	Page	: 1 of 7
Client	: **REDITUS CONSULTING PTY LTD.**	Laboratory	: Environmental Division Sydney
Contact	: Dean Stafford	Contact	: Customer Services ES
Address	: 1A/29-33 Waratah Street KIRRAWEE	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 24109	Date Samples Received	: 23-Aug-2024
Order number	: ----	Date Analysis Commenced	: 26-Aug-2024
C-O-C number	: ----	Issue Date	: 30-Aug-2024
Sampler	: TIARNI WIERSMA		
Site	:		
Quote number	: EN/333		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 6018875)									
EN2409672-002	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	0.0001	0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.001	0.002	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.024	0.024	0.0	0% - 20%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.025	0.025	0.0	No Limit
ES2428078-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.003	0.003	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.011	0.011	0.0	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 6018876)									
EW2403867-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ME2401362-005	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 6011715)									
ES2427690-001	Anonymous	EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Naphthalene	91-20-3	1	µg/L	3.5	3.0	16.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	1	µg/L	1.2	1.2	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 6011715) - continued									
ES2427690-001	Anonymous	EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	<1.0	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6011716)									
ES2427690-001	Anonymous	EP071: C15 - C28 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6012201)									
ES2427652-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES2427685-002	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	40	40	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6011716)									
ES2427690-001	Anonymous	EP071: >C10 - C16 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6012201)									
ES2427652-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
ES2427685-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	30	20	0.0	No Limit
EP080: BTEXN (QC Lot: 6012201)									
ES2427652-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES2427685-002	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP080: BTEXN (QC Lot: 6012201) - continued									
ES2427685-002	Anonymous	EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit

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

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

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 6018875)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	94.2	85.0	114
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	89.0	84.0	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	89.2	85.0	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	91.8	81.0	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	89.7	83.0	111
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	91.1	82.0	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	92.8	81.0	117
EG035F: Dissolved Mercury by FIMS (QCLot: 6018876)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	104	83.0	105
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 6011715)								
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	68.6	50.0	94.0
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	76.8	63.6	114
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	74.7	62.2	113
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	72.0	63.9	115
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	82.9	62.6	116
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	84.2	64.3	116
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	87.1	63.6	118
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	88.1	63.1	118
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	84.4	64.1	117
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	79.9	62.5	116
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	5 µg/L	94.1	61.7	119
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	74.0	63.0	115
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	88.4	63.3	117
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	83.1	59.9	118
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	86.8	61.2	117
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	84.8	59.1	118
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6011716)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	84.9	53.7	97.0
EP071: C15 - C28 Fraction	----	100	µg/L	<100	600 µg/L	82.7	63.3	107
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	91.1	58.3	120

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6012201)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	85.4	75.0	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6011716)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	86.8	53.9	95.5
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	700 µg/L	108	57.8	110
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	300 µg/L	70.5	50.5	115
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6012201)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	76.6	75.0	127
EP080: BTEXN (QCLot: 6012201)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	95.0	68.3	119
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	96.9	73.5	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	97.8	73.8	122
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	105	73.0	122
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	105	76.4	123
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	104	75.5	124

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG020F: Dissolved Metals by ICP-MS (QCLot: 6018875)							
ES2427788-001	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	92.4	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	86.7	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	88.3	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	94.7	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	91.3	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	89.9	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	92.0	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 6018876)							
ES2427802-001	TRIP1	EG035F: Mercury	7439-97-6	0.01 mg/L	74.4	70.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 6011715)							
ES2427690-002	Anonymous	EP075(SIM): Acenaphthene	83-32-9	20 µg/L	# Not Determined	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 6011715) - continued							
ES2427690-002	Anonymous	EP075(SIM): Pyrene	129-00-0	20 µg/L	# 64.4	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6011716)							
ES2427690-002	Anonymous	EP071: C10 - C14 Fraction	----	200 µg/L	# Not Determined	70.0	130
		EP071: C15 - C28 Fraction	----	250 µg/L	# Not Determined	71.0	130
		EP071: C29 - C36 Fraction	----	200 µg/L	114	67.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6012201)							
ES2427652-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	93.6	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6011716)							
ES2427690-002	Anonymous	EP071: >C10 - C16 Fraction	----	250 µg/L	# Not Determined	70.0	130
		EP071: >C16 - C34 Fraction	----	350 µg/L	88.9	75.0	130
		EP071: >C34 - C40 Fraction	----	150 µg/L	116	67.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6012201)							
ES2427652-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	87.9	70.0	130
EP080: BTEXN (QCLot: 6012201)							
ES2427652-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	105	70.0	130
		EP080: Toluene	108-88-3	25 µg/L	107	70.0	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	105	70.0	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	109	70.0	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	109	70.0	130
		EP080: Naphthalene	91-20-3	25 µg/L	104	70.0	130

Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2.4.6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72	143
Toluene-D8	2037-26-5	75	131
4-Bromofluorobenzene	460-00-4	73	137

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2427802**	Page	: 1 of 5
Client	: **REDITUS CONSULTING PTY LTD.**	Laboratory	: Environmental Division Sydney
Contact	: Dean Stafford	Telephone	: +61-2-8784 8555
Project	: 24109	Date Samples Received	: 23-Aug-2024
Site	:	Issue Date	: 30-Aug-2024
Sampler	: TIARNI WIERSMA	No. of samples received	: 1
Order number	: ----	No. of samples analysed	: 1

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	ES2427690--002	Anonymous	**Acenaphthene**	83-32-9	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	ES2427690--002	Anonymous	**Pyrene**	129-00-0	64.4 %	70.0-130%	**Recovery less than lower data quality objective**
EP080/071: Total Petroleum Hydrocarbons	ES2427690--002	Anonymous	**C10 - C14 Fraction**	----	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP080/071: Total Petroleum Hydrocarbons	ES2427690--002	Anonymous	**C15 - C28 Fraction**	----	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP080/071: Total Recoverable Hydrocarbons - NEPM 2	ES2427690--002	Anonymous	**>C10 - C16 Fraction**	----	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Analysis Holding Time Compliance

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

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

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

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

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)							
TRIP1	**22-Aug-2024**	**----**	----	**----**	**28-Aug-2024**	18-Feb-2025	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F)							
TRIP1	**22-Aug-2024**	**----**	----	**----**	**29-Aug-2024**	19-Sep-2024	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM))							
TRIP1	**22-Aug-2024**	**27-Aug-2024**	29-Aug-2024	✓	**29-Aug-2024**	06-Oct-2024	✓

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071)							
TRIP1	**22-Aug-2024**	**27-Aug-2024**	29-Aug-2024	✓	**30-Aug-2024**	06-Oct-2024	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
TRIP1	**22-Aug-2024**	**26-Aug-2024**	05-Sep-2024	✓	**27-Aug-2024**	05-Sep-2024	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071)							
TRIP1	**22-Aug-2024**	**27-Aug-2024**	29-Aug-2024	✓	**30-Aug-2024**	06-Oct-2024	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
TRIP1	**22-Aug-2024**	**26-Aug-2024**	05-Sep-2024	✓	**27-Aug-2024**	05-Sep-2024	✓
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080)							
TRIP1	**22-Aug-2024**	**26-Aug-2024**	05-Sep-2024	✓	**27-Aug-2024**	05-Sep-2024	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **WATER**

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

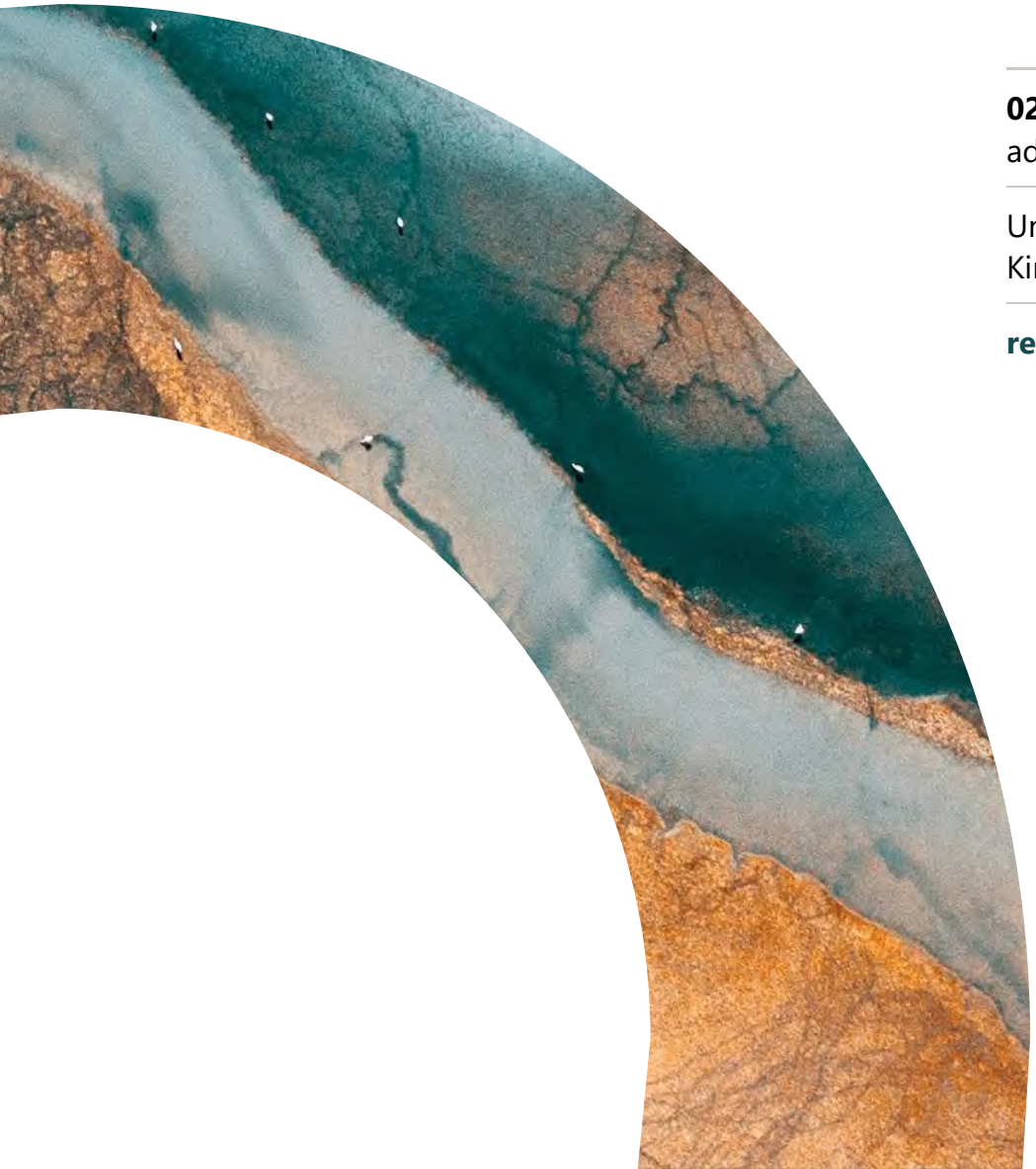
Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Dissolved Mercury by FIMS	EG035F	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	6	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	7	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Dissolved Mercury by FIMS	EG035F	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Dissolved Mercury by FIMS	EG035F	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Dissolved Mercury by FIMS	EG035F	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015 The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM Schedule B(3)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for purging.



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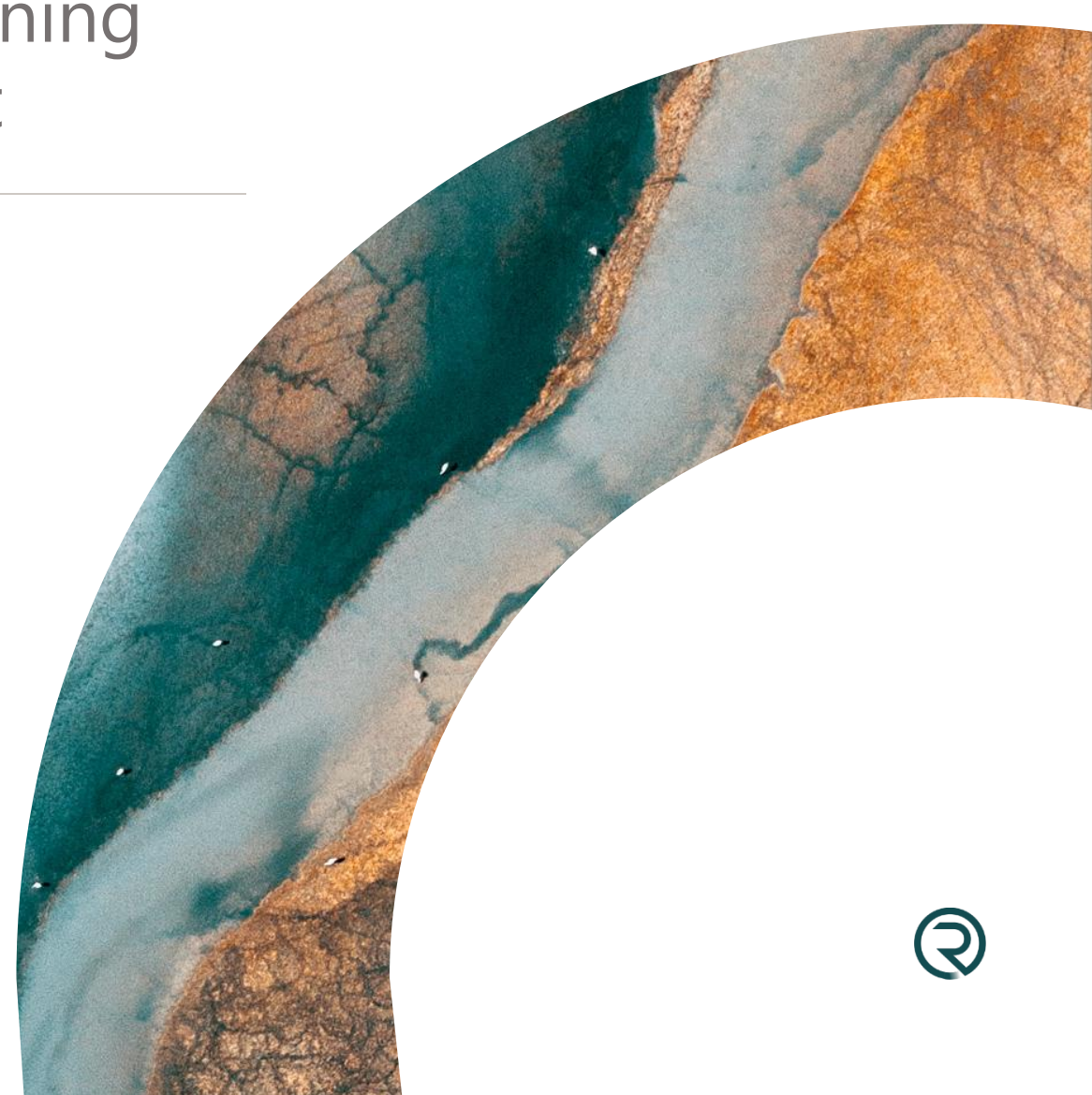
02 9521 6567
admin@reditusconsulting.com

Unit 1A, 29-33 Waratah Street,
Kirrawee NSW 2232

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Acid Sulfate Soil Load Screening Sheet

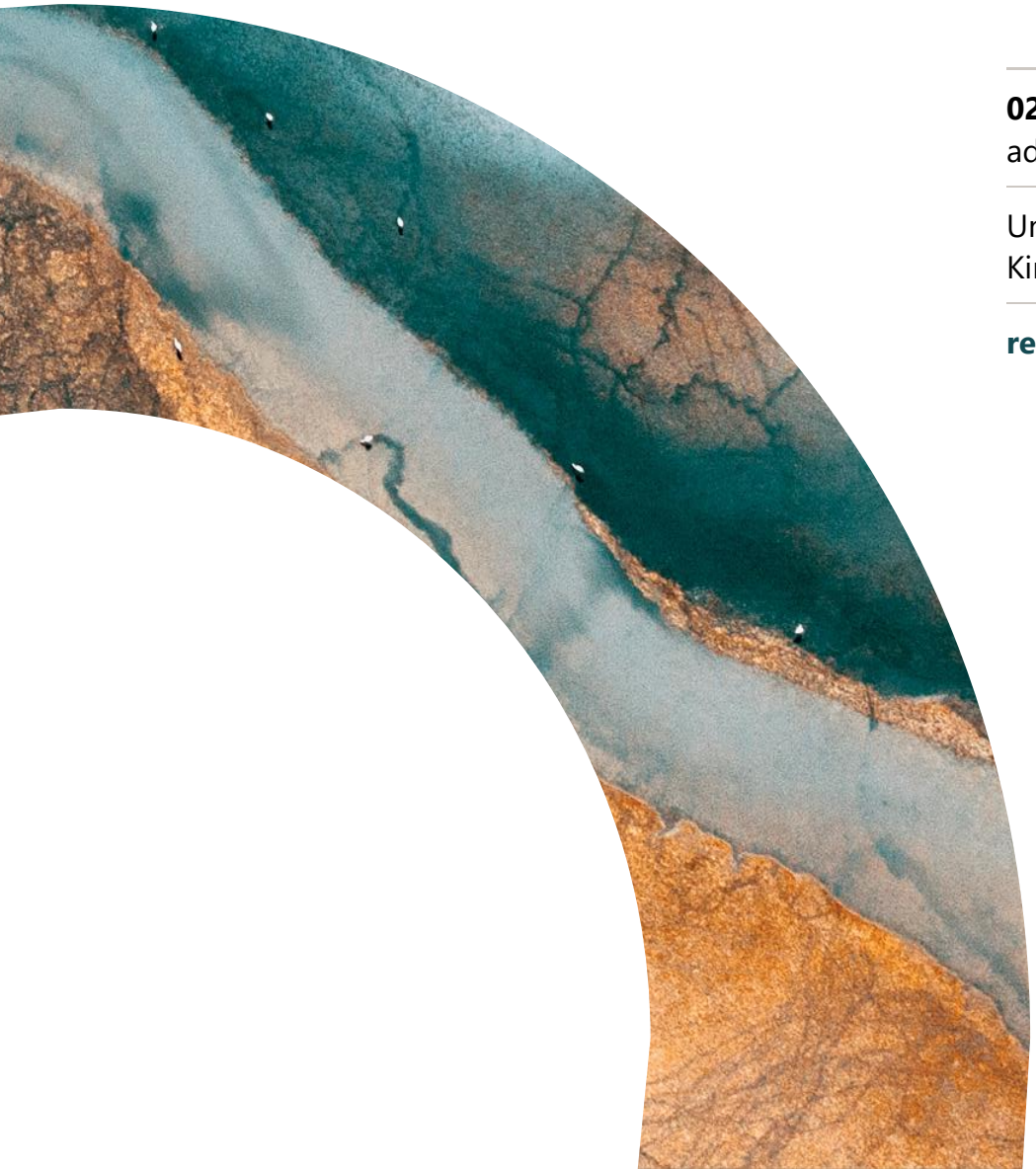


Acid Sulfate Soils Load Screening Sheet

SOURCE SITE DETAILS	
Project Name:	
Address:	
Lot & DP:	
Site Contact Name:	
Site Contact Phone Number:	

REBURIAL SITE DETAILS	
Company/Landfill Name:	
Address:	

SOIL SCREENING DETAILS	
Date:	
Time of soil disturbance/excavation:	
Transporter Company Name:	
Transporter Address:	
Transporter Contact Details:	
Transporter Vehicle Registration:	
Approximate Volume of Soil:	
pH of Load (must be >5.6):	
Time of pH testing:	
Load Tester's Name:	
Load Tester's Phone Number:	
Load Tester's Signature:	



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02 9521 6567
admin@reditusconsulting.com

Unit 1A, 29-33 Waratah Street,
Kirrawee NSW 2232

reditus.com.au