REPORT TO

T&P CHIMES DEVELOPMENT PTY LTD

ON

DETAILED SITE INVESTIGATION

FOR

PROPOSED MIXED-USE DEVELOPMENT

AT

45-53 MACLEAY STREET, POTTS POINT, NSW

Date: 3 February 2026

Ref: E34303Brpt3.Rev5-DSI

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E34303Brpt3.Rev3-DSI	Revised Report – SEARs update	30 October 2025
E34303Brpt3.Rev4-DSI	Revised Report – Minor SEARs update	26 November 2025
E34303Brpt3.Rev5-DSI	Revised Report – Minor update to client name	3 February 2026

Executive Summary

This Detailed (Stage 2) Site Contamination Investigation (DSI) has been prepared by JK Environments (JKE) on behalf of T&P Chimes Development Pty Ltd (the Applicant) to accompany a State Significant Development Application (SSDA) for a shop top housing development at 45-53 Macleay Street, Potts Point (the site).

The proposal seeks approval for the construction and operation of a 16-storey shop-top housing development comprising:

- 44 apartments, including:
  - 23 affordable apartments on podium level 1 and 2 which will be managed by a community housing provider (CHP) for 15 years;
  - 21 market apartments over 12 levels;
- Ground floor retail;
- Four levels of basement for parking, services and storage;
- Vehicular and loading access from McDonald Street; and
- Landscaping and communal open space.

This report has been prepared in response to the requirements contained within the Secretary's Environmental Assessment Requirements (SEARs) dated 16 May 2025 issued for the SSDA (SSD-83867719). Specifically, this report has been prepared to respond to the SEARS requirement issued below.

Table – SEARs Requirement

Item	Description of Requirement	Section Reference (this report)
11. Contamination and Remediation	In accordance with Chapter 4 of the State Environmental Planning Policy (Resilience and Hazards) 2021, assess and quantify any soil and groundwater contamination and demonstrate that the site is suitable (or will be suitable, after remediation) for the development.	This is a DSI report and addresses the second stage of the contamination assessment process. The conclusions and recommendations of the DSI are presented in Section 8.

The purpose of the DSI is to make an assessment of site contamination and establish whether the site needs to be remediated. The site location is shown on Figure 1 and the investigation was confined to the site boundaries as shown on Figure 2 attached in the appendices. JKE note that a previous revision of the DSI was prepared to address the requirement outlined under Contention No. 2 of the Land and Environment Court (LEC) proceeding (case number 2023/00115313) with regards to Chapter 4 of State Environmental Planning Policy (Resilience and Hazards) 2021 (formerly known as SEPP55).

JKE has previously undertaken a Preliminary Site Investigation (PSI) for the proposed development. A summary of this information has been included in Section 2. This report should be read in conjunction with the PSI report.

JKE understand that the client has engaged Ms Rowena Salmon, NSW EPA accredited site auditor to undertake a site audit with regards to the Contaminated Land Management (CLM) Act (1997). An Interim Audit Advice (IAA) Letter No. 1 was issued by Ramboll dated 31 October 2022. A summary of the IAA is presented in Section 2.1.3. The DSI should be issued to the auditor for review as part of the audit process.

JKE prepared a Sampling Analysis Quality Plan (SAQP) for the DSI in July 2023. The SAQP is attached in the appendices. A summary of and deviations to the SAQP are summarised in Section 4.

Our geotechnical division JK Geotechnics (JKG) was commissioned by the client to undertake a geotechnical investigation at the site in conjunction with the DSI. The results of the geotechnical investigation are presented in a separate report (Project Ref: 34303PE2rpt), which should be read in conjunction with this DSI report.

Based on a review of the supplied information, we understand that following demolition, the proposed development will include construction of a 16-storey shop top housing building four basement levels which will extent to the north and west site boundaries. A deep planting zone of approximately 223m^2 is proposed along the south site boundary. Excavation to a depth of approximately 13m below current surface levels is proposed for the basements.

The primary aims of the investigation were to identify any past or present potentially contaminating activities at the site, identify the potential for site contamination, and make an assessment of the soil, soil vapour and groundwater contamination conditions in order to inform site remediation (if required). The DSI was also designed to assess the potential for acid sulfate soil (ASS) to be disturbed during the development and to provide preliminary waste classification data for off-site disposal of soil waste which may be generated during the proposed development works.

The DSI objectives are to:
- Provide a summary of the past site use(s) based on a review of the PSI report;
- Assess the current site conditions and use(s) via a site walkover inspection;
- Investigate the potential contamination sources/areas of environmental concern (AEC) and contaminants of potential concern (CoPC) identified in the PSI;
- Assess the soil, soil vapour and groundwater contamination conditions via implementation of a sampling and analysis program;
- Update and reassess the conceptual site model (CSM);
- Assess the potential risks posed by contamination to the receptors identified in the CSM (Tier 1 assessment);
- Assess the potential for ASS to be disturbed during the proposed development works and if an ASS management plan (ASSMP) is required for the proposed development;
- Provide a preliminary waste classification for off-site disposal of soil;
- Assess whether the site is suitable or can be made suitable for the proposed development (from a contamination viewpoint); and
- Assess whether further intrusive investigation and/or remediation is required.

The scope of work included the following:
- Review of site information, including background and site history information presented in the PSI report;
- Preparation of a CSM and SAQP;
- Implementation of the SAQP;
- Interpretation of the analytical results against the adopted Site Assessment Criteria (SAC);
- Data Quality Assessment; and
- Preparation of a DSI report including a Tier 1 risk assessment.

The DSI included a review of existing project information, a site inspection, soil sampling from nine locations including seven boreholes and two test pits, soil vapour sampling from five sub-slab vapour pins and groundwater sampling from three monitoring wells (see Figure 2). The following potential contamination sources were identified at the site: fill material; use of pesticides; hazardous building materials from existing or former structures; and off-site dry cleaners with the closest one located approximately 60m to the south of the site.

The sampling locations encountered fill materials to depths of approximately 0.15mBGL to 0.85mBGL, underlain by sandstone bedrock. The sandstone was at shallow depths occurring below the concrete pavement in BH3. The fill contained inclusions of igneous and sandstone gravel, slag, roots and root fibres, trace of brick, concrete and plastic fragments and clay fine. There was no fibre cement fragments (FCF) or asbestos containing material (ACM) identified in any of the bulk asbestos quantification field screening samples.

The DSI identified potential health risks associated with carcinogenic polycyclic aromatic hydrocarbons (PAHs) in fill soil. Potential ecological risks from total recoverable hydrocarbons (TRHs) in fill soil were also identified (see Figure 3). Risks associated with soil vapour and groundwater were assessed to be low based on the DSI data. Further sampling and risk assessment is required and this is to occur under the provisions of the remediation action plan (RAP) as noted below.

The DSI identified that remediation of the site will be required. Additional investigation is also required to address the data gaps identified in Section 7.4. However, we consider that it would be reasonable to include the requirements for further investigation within the RAP because a large portion of this work will need to occur after demolition. It is expected that remediation will include the removal/off-site disposal of fill associated with the basement excavation.

JKE is of the opinion that the site can be made suitable for the proposed development via remediation. The DSI recommends the following mitigation measures:

1. Preparation and implementation of a RAP. The RAP must include a data gap investigation (DGI) to address the data gaps identified in Section 7.4; and
2. Preparation of a validation assessment report for the remediation works undertaken at the site.

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

Based on the DIS results, JKE is of the opinion that the site contamination does not trigger the requirements to notify the NSW EPA under NSW EPA Guidelines on the Duty to Report Contamination under Section 60 of the CLM Act 1997 (2015), and provided the recommendations outlined in the DSI are implemented.

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

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Attachments

Abbreviations

Asbestos Fines/Fibrous Asbestos	**AF/FA**
Ambient Background Concentrations	**ABC**
Added Contaminant Limits	**ACL**
Asbestos Containing Material	**ACM**
Australian Drinking Water Guidelines	**ADWG**
Area of Environmental Concern	**AEC**
Australian Height Datum	**AHD**
Acid Sulfate Soil	**ASS**
Acid Sulfate Soil Management Plan	**ASSMP**
Acid Sulfate Soil Management Advisory Committee	**ASSMAC**
Above-Ground Storage Tank	**AST**
Before You Dig Australia	**BYDA**
Below Ground Level	**BGL**
Benzo(a)pyrene Toxicity Equivalent Factor	**BaP TEQ**
Bureau of Meteorology	**BOM**
Benzene, Toluene, Ethylbenzene, Xylene	**BTEX**
Cation Exchange Capacity	**CEC**
Combined Risk Value	**CRV**
Contaminated Land Management	**CLM**
Contaminant(s) of Potential Concern	**CoPC**
Chain of Custody	**COC**
Conceptual Site Model	**CSM**
Development Application	**DA**
Data Quality Indicator	**DQI**
Data Quality Objective	**DQO**
Detailed Site Investigation	**DSI**
Dynamic Cone Penetration	**DCP**
Ecological Investigation Level	**EIL**
Ecological Screening Level	**ESL**
Environmental Management Plan	**EMP**
Excavated Natural Material	**ENM**
Environment Protection Authority	**EPA**
Environmental Site Assessment	**ESA**
Fibre Cement Fragment(s)	**FCF**
General Approval of Immobilisation	**GAI**
Health Investigation Level	**HILs**
Health Screening Level	**HSL**
Health Screening Level-Site Specific Assessment	**HSL-SSA**
International Organisation of Standardisation	**ISO**
Interim Audit Advice	**IAA**
JK Environments	**JKE**
JK Geotechnics	**JKG**
Land and Environment Court	**LEC**
Lab Control Spike	**LCS**
Local Environmental Plan	**LEP**
Light Non-Aqueous Phase Liquid	**LNAPL**
Map Grid of Australia	**MGA**
National Association of Testing Authorities	**NATA**
National Environmental Protection Measure	**NEPM**
Organochlorine Pesticides	**OCP**
Organophosphate Pesticides	**OPP**
Polycyclic Aromatic Hydrocarbons	**PAH**
Potential ASS	**PASS**

Polychlorinated Biphenyls	**PCBs**
Per-and Polyfluoroalkyl Substances	**PFAS**
Perfluorooctanoic Acid	**PFOA**
Perfluorooctanesulfonic Acid	**PFOS**
Perfluorohexane Sulfonate	**PFHxS**
Photo-ionisation Detector	**PID**
Protection of the Environment Operations	**POEO**
Practical Quantitation Limit	**PQL**
Preliminary Site Investigation	**PSI**
Quality Assurance	**QA**
Quality Control	**QC**
Remediation Action Plan	**RAP**
Relative Percentage Difference	**RPD**
Site Assessment Criteria	**SAC**
Sampling, Analysis and Quality Plan	**SAQP**
Secretary's Environmental Assessment Requirements	**SEARs**
Site Audit Statement	**SAS**
Site Audit Report	**SAR**
State Environmental Planning Policy	**SEPP**
Site Specific Assessment	**SSA**
Source, Pathway, Receptor	**SPR**
Specific Contamination Concentration	**SCC**
Standard Penetration Test	**SPT**
Standing Water Level	**SWL**
State Significant Development	**SSD**
Trip Blank	**TB**
Toxicity Characteristic Leaching Procedure	**TCLP**
Total Recoverable Hydrocarbons	**TRH**
Trip Spike	**TS**
Upper Confidence Limit	**UCL**
United States Environmental Protection Agency	**USEPA**
Underground Storage Tank	**UST**
Virgin Excavated Natural Material	**VENM**
Volatile Organic Compounds	**VOC**
Volatile Organic Chlorinated Compounds	**VOCC**
World Health Organisation	**WHO**
Work Health and Safety	**WHS**

Units

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

1 INTRODUCTION

This Detailed Site Investigation (DSI) has been prepared by JK Environments (JKE) on behalf of T&P Chimes Development Pty Ltd (the Applicant) to accompany a State Significant Development Application (SSDA) for a for a shop top housing development at 45-53 Macleay Street, Potts Point (the site).

The proposal seeks approval for the construction and operation of a 16-storey shop-top housing development comprising:

- 44 apartments, including:
  - 23 affordable apartments on podium level 1 and 2 which will be managed by a community housing provider (CHP) for 15 years;
  - 21 market apartments over 12 levels;
- Ground floor retail;
- Four levels of basement for parking, services and storage;
- Vehicular and loading access from McDonald Street; and
- Landscaping and communal open space.

1.1 Response to SEARs

This report has been prepared in response to the requirements contained within the Secretary's Environmental Assessment Requirements (SEARs) dated 16 May 2025 issued for the SSDA (SSD-83867719). Specifically, this report has been prepared to respond to the SEARS requirement issued below.

Table 1-1: SEARs Requirement

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11. Contamination and Remediation	In accordance with Chapter 4 of the State Environmental Planning Policy (Resilience and Hazards) 2021, assess and quantify any soil and groundwater contamination and demonstrate that the site is suitable (or will be suitable, after remediation) for the development.	This is a DSI report and addresses the second stage of the contamination assessment process. The conclusions and recommendations of the DSI are presented in Section 8.

1.2 DSI Report Introduction

The purpose of the DSI is to make an assessment of site contamination and establish whether the site needs to be remediated. The site location is shown on Figure 1 and the investigation was confined to the site boundaries as shown on Figure 2 attached in the appendices.

The DSI has been formerly prepared to address the requirement outlined under Contention No. 2 of the Land and Environment Court (LEC) proceeding (case number 2023/00115313) with regards to Chapter 4 of State Environmental Planning Policy (Resilience and Hazards) 2021[1] (formerly known as SEPP55).

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

JKE has previously undertaken a Preliminary Site Investigation (PSI)[2] for the proposed development. A summary of this information has been included in Section 2. This report should be read in conjunction with the PSI report.

JKE understand that the client has engaged Ms Rowena Salmon, NSW EPA accredited site auditor to undertake a site audit with regards to the Contaminated Land Management (CLM) Act (1997)[3]. An Interim Audit Advice (IAA) Letter No. 1 was issued by Ramboll dated 31 October 2022[4]. A summary of the IAA is presented in Section 2.1.3. The DSI should be issued to the auditor for review as part of the audit process.

JKE prepared a Sampling Analysis Quality Plan (SAQP) for the DSI in July 2023[5]. The SAQP is attached in the appendices. A summary of and deviations to the SAQP are summarised in Section 4.

A preliminary geotechnical assessment was previously undertaken by JK Geotechnics (JKG). The results of the preliminary assessment are presented in a separate report (Ref: 34303Rrpt, dated 26 August 2021)[6]. JKG was commissioned by the client to undertake a geotechnical investigation at the site in conjunction with the DSI. The results of the geotechnical investigation are presented in a separate report (Ref: 34303RErpt Rev1, dated 5 February 2024)[7], which should be read in conjunction with this DSI report.

1.3 Proposed Development Details

Based on a review of the supplied information, we understand that following demolition, the proposed development will include construction of a 16-storey shop top housing building four basement levels which will extent to the north and west site boundaries. A deep planting zone of approximately 223m^2 is proposed along the south site boundary. Excavation to a depth of approximately 13m below current surface levels is proposed for the basements.

1.4 Aims and Objectives

The primary aims of the investigation were to identify any past or present potentially contaminating activities at the site, identify the potential for site contamination, and make an assessment of the soil, soil vapour and groundwater contamination conditions in order to inform site remediation if required.

The DSI was also designed to assess the potential for acid sulfate soil (ASS) to be disturbed during the development and to provide preliminary waste classification data for off-site disposal of soil waste which may be generated during the proposed development works.

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[2] JKE (2025). *Report to Time and Place on Preliminary (Stage 1) Site Contamination Investigation for Proposed Mixed-Use Development at 45-53 Macleay Street, Potts Point, NSW.* (Ref: E34303Brpt.Rev3, dated 10 November 2025) (referred to as PSI)
[3] Contaminated Land Management Act 1997 (NSW) (referred to as CLM Act 1997)
[4] Ramboll (2022). Interim Audit Advice Letter No. 1 – Preliminary (Stage 1) Site Contamination Investigation, 45-53 Macleay Street, Potts Point, NSW. Dated 31 October 2022 (referred to as IAA)
[5] JKE (2023). *Report to Time and Place on Sampling Analysis Quality Plan for Detailed Site Investigation for Proposed Residential Development at 45-53 Macleay Street, Potts Point, NSW.* (Ref: E34303Brpt2-SAQP, dated 31 July 2023) (referred to as SAQP)
[6] JKG, (2021). *Report to Time and Place Development Pty Ltd on Preliminary Geotechnical Assessment for Proposed Redevelopment at 45-53 Macleay Street, Potts Point, NSW.* (referred to as JKG 2021 report)
[7] JKG, (2024). *Report to Time and Place Development Pty Ltd on Geotechnical Investigation for Proposed Redevelopment at 45-53 Macleay Street, Potts Point, NSW.* (referred to as JKG 2024 report)

The DSI objectives are to:

- Provide a summary of the past site use(s) based on a review of the PSI report;
- Assess the current site conditions and use(s) via a site walkover inspection;
- Investigate the potential contamination sources/areas of environmental concern (AEC) and contaminants of potential concern (CoPC) identified in the PSI;
- Assess the soil, soil vapour and groundwater contamination conditions via implementation of a sampling and analysis program;
- Update and reassess the conceptual site model (CSM);
- Assess the potential risks posed by contamination to the receptors identified in the CSM (Tier 1 assessment);
- Assess the potential for ASS to be disturbed during the proposed development works and if an ASS management plan (ASSMP) is required for the proposed development;
- Provide a preliminary waste classification for off-site disposal of soil;
- Assess whether the site is suitable or can be made suitable for the proposed development (from a contamination viewpoint); and
- Assess whether further intrusive investigation and/or remediation is required.

1.5 Scope of Work

The investigation was undertaken generally in accordance with a JKE proposal (Ref: EP58656B2) of 1 June 2023 and written acceptance from the client in the form of a Consultancy Agreement. The scope of work included the following:

- Review of site information, including background and site history information presented in the PSI report;
- Preparation of a CSM and SAQP;
- Implementation of the SAQP;
- Interpretation of the analytical results against the adopted Site Assessment Criteria (SAC);
- Data Quality Assessment; and
- Preparation of a DSI report including a Tier 1 risk assessment.

The scope of work was undertaken with reference to the National Environmental Protection (Assessment of Site Contamination) Measure 1999 as amended (2013)[8], other guidelines made under or with regards to the Contaminated Land Management Act (1997)[9] and SEPP Resilience and Hazards 2021.

The ASS assessment will be undertaken with reference to the National Acid Sulfate Soil Guidance (2018) documents and the Acid Sulfate Soil Management Advisory Committee (ASSMAC) Acid Sulfate Soil Manual (1998)[10].

A list of reference documents/guidelines is included in the appendices.

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

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

[10] Acid Sulfate Soils Management Advisory Committee (ASSMAC), (1998). *Acid Sulfate Soils Manual* (ASS Manual 1998)

2 SITE INFORMATION

2.1 Background

2.1.1 Summary of PSI Report

JKE was commissioned to undertake a PSI for the proposed development. The primary aims of the PSI were to: identify past or present potentially contaminating activities at the site; identify the potential for site contamination; and assess the need for further investigation.

The objectives of the PSI were to:

- Provide an appraisal of the past site use(s) based on a review of historical records;
- Assess the current site conditions and land use by completing a site walkover inspection;
- Identify potential contamination sources/AEC and CoPC;
- Prepare a CSM; and
- Assess whether an intrusive investigation is required.

The scope of works included: review of site information, including background and site history information from various sources outlined in the report; walkover site inspection; and preparation of a PSI report presenting the results of the assessment, including a CSM.

Based on the site history assessment, JKE identified the site and surrounds have historically been used for a mixture of residential and commercial purposes. Historical businesses registered at the site had included a medical practitioner and hotel. In more recent time, the site has been used for activities such as hotel and high-rise residential.

Potential AEC identified at the site included:

- Fill material (i.e. historically imported soil) at the site (entire site);
- Use of pesticides within the site;
- Hazardous building materials within current and former buildings/structures; and
- Current and historical dry cleaners located up-gradient and within close proximity of the site.

The PSI recommended that the following to be undertaken at the site:

- A DSI should be undertaken to characterise the site contamination conditions and establish whether the site is suitable for the proposed development, or whether remediation is required;
- An ASS assessment to establish the potential for actual or potential ASS to be present, and assess the need to prepare an ASSMP; and
- A hazardous building materials survey undertaken prior to demolition of the buildings. Following demolition of the buildings (and preferably prior to removal of the hardstand), an asbestos clearance certificate should be obtained.

The PSI also recommend that a waste classification be undertaken to classify material to be excavated for the proposed development.

2.1.2 Summary of JKG Geotechnical Reports

JKG was commissioned in 2021 to undertake a preliminary desktop geotechnical assessment for the proposed development. The purpose of the assessment was to review JKG database of nearby geotechnical investigations and complete a site inspection.

The report identified the following likely subsurface conditions at the site:

- Sandy fill below the paved surfaces estimated to extent to a depth of approximately 1.5mBGL;
- An intermittent layer of residual clayey or sandy soils of an estimated maximum thickness of approximately 0.5m;
- Below the fill and/or residual soils, weathered sandstone bedrock is expected to be encountered at a maximum depth of approximately 1.5mBGL. On first contact, the sandstone is expected to be of variable quality ranging between extremely weathered and highly weathered and typically of very low to low strength with soil strength bands associated with the extremely weathered bedrock. Below approximately 2m to 4m depth, the sandstone is expected to improve to typically moderately to slightly weathered and of low to medium strength. The defects in the sandstone are expected to comprise sub-horizontal clay seams, extremely weathered seams and steeply inclined joints; and
- Localised very small quantities of groundwater seepage may be encountered within the soil profile at the soil-bedrock interface and possibly along discrete defects within the rock mass.

JKG was commissioned in 2023 to undertake a geotechnical investigation for the proposed development. The investigation included drilling three boreholes (BH1 to BH3), excavation of two test pits (TP4 and TP5) and completion of two Dynamic Cone Penetration (DCP) tests (DCP4 & DCP5) at selected locations. A summary of the subsurface conditions encountered during the JKG 2023 investigation is presented in Section 5.2.

2.1.3 Summary of IAA No. 1

Ramboll was engaged to review the PSI and provide an IAA for the proposed development. The IAA stated that the recommendations outlined in the PSI report were applicable and recommended the following:

- Develop a SAQP for the DSI. The SAQP should also include ASS sampling and a search of SafeWork NSW dangerous goods records. Review and approval of the SAQP by an EPA Accredited Site Auditor was required;
- Completion of the DSI and the hazardous building materials survey. The hazardous building materials survey should be completed prior to site demolition whilst the DSI can be undertaken prior to or post demolition (but prior to development);
- Development of a DSI report presenting the findings from the investigation. The DSI report must draw conclusions on the suitability of the site for its intended use and must be reviewed and approved by an EPA Accredited Site Auditor. The DSI conclusions should consider the development design (once completed).
  - If the results of the DSI indicate the site is suitable for the proposed future land use, the appointed EPA Accredited Site Auditor will prepare a Section A Site Audit Statement (SAS) and supporting Site Audit Report (SAR) confirming the suitability of the site for the intended use;
  - If DSI results indicate remediation of site soil and/or groundwater is required, a site-specific Remediation Action Plan (RAP) must be prepared to detail how the site can be made suitable (from a contamination perspective) for the proposed future land use. The RAP needs to consider

the proposed development design and must be reviewed and approved by an EPA Accredited Site Auditor. It is appropriate for the RAP to be completed following development design and prior to submission of a further DA for construction of the development;

  - If a RAP is required, validation of the remediation works is required to be documented in a Validation Report confirming that the works have been undertaken in accordance with the RAP and certifying the suitability of the site post-remediation. The appointed EPA Accredited Site Auditor will then prepare a Section A SAS and supporting SAR confirming the site suitability. It is appropriate for the SAS/SAR to be prepared prior to occupation of the development; and

- Submission of SAS and supporting SAR confirming suitability of the site for the proposed end use to the NSW EPA and the City as required for a Statutory Audit (if audit requirement included in future consent conditions).

2.2 Site Identification

Table 2-1: Site Identification

Current Site Owner (certificate of title):	The owners of Strata Plan No. 934
Site Address:	45-53 Macleay Street, Potts Point, NSW
Lot & Deposited Plan:	SP934
Current Land Use:	Residential
Proposed Land Use:	Mixed Use - Residential and commercial (ground floor retail)
Local Government Authority (LGA):	City of Sydney
Current Zoning:	B4 – Mixed use
Site Area (m^2) (approx.):	1,300
RL (AHD in m) (approx.):	27-28
Geographical Location (decimal degrees) (approx. centre of site):	Latitude: -33.86839 Longitude: 151.22548
Site Plans:	See Figures attached in Appendix A

2.3 Site Location and Regional Setting

The site is located in a predominantly residential and commercial area of Potts Point and is bound by Macleay Street to the east and accessed from McDonald Street to the north. The site is located approximately 170m to the west of Elizabeth Bay. Department of Defence facility (HMAS Kuttabul) is located to the north of the site.

2.4 Topography

The regional topography is characterised by a plateau that falls towards the east and west. The regional topography declines steeply towards the east and west at points located approximately 100m away from the site. The site is located on the peak of the plateau and generally falls to the north at approximately 1°-2°. Parts of the site appear to have been levelled to account for the slope and accommodate the existing development.

2.5 Site Inspection

A walkover inspection of the site was undertaken by JKE for the DSI on 31 July 2023. The inspection was limited to accessible areas of the site and immediate surrounds. An internal inspection of buildings was not undertaken. Selected site photographs obtained during the inspection are attached in the appendices. A summary of the inspection findings is outlined below:

2.5.1 Current Site Use and/or Indicators of Former Site Use

At the time of the DSI inspection, the site was occupied by a large residential apartment building including paved common areas used for access and resident vehicle parking. An under-croft parking was located beneath the residential building which provided access to the upper floors of the apartment. No indicators of former site use were observed during the inspection.

2.5.2 Buildings, Structures and Roads

The site was occupied by a ten-storey residential apartment building of concrete construction. With the exception of landscaped areas located along the northern and eastern street frontages, the open areas of the site were concrete paved and used as a car park associated with the residential apartments. Basements were not observed during the inspection. The onsite building and pavements generally appeared in good condition based on a cursory external inspection. There was considered to be a potential for hazardous building materials to be present based on the age of the building.

2.5.3 Boundary Conditions, Soil Stability and Erosion

The site boundaries were defined by adjacent building walls to the south, onsite building wall to the north, landscaped area to the east and steel post fencing to the west. Evidence of soil instability or erosion were not observed onsite during the inspection.

2.5.4 Presence of Drums/Chemical Storage and Waste

Access into the apartment building was not possible during the inspection. However, based on the residential use of the site and the lack of indicators for sources of contamination, JKE is of the opinion that there is unlikely to be drums, significant quantities of chemicals and/or waste stored at the site that may cause potential onsite contamination.

2.5.5 Evidence of Cut and Fill

The site appeared to have been levelled to accommodate for the current development. Based on the JKG desktop review, fill is anticipated to be present below the pavements at the site. Fill was also evident in the landscaped areas.

2.5.6 Visible or Olfactory Indicators of Contamination (odours, spills etc)

Visible or olfactory indicators of contamination, including indicators of potential above or underground fuel storage tanks (ASTs/USTs) were not observed the site during the inspection.

2.5.7 Drainage and Services

Surface water generated from rainfall would generally be expected to be intercepted and collected by onsite building guttering and routed to the local stormwater infrastructure. Excess rainfall forming overland flow would be expected to flow overland across impermeable site surfaces (concrete pavements) towards the north in sympathy of the site topography. Landscaped areas located along the northern and eastern site boundaries would be expected to allow infiltration of effective rainfall and any surface runoff generated from up-gradient areas. Onsite stormwater drains are also expected to collect and intercept runoff to the local municipal stormwater infrastructure.

2.5.8 Sensitive Environments

Sensitive environments such as wetlands, ponds, creeks or extensive areas of natural vegetation were not identified on site or in the immediate surrounds. Elizabeth Bay is located approximately 170m to the east and cross-gradient of the site.

2.5.9 Landscaped Areas and Visible Signs of Plant Stress

Native and exotic vegetation including ground cover, shrubs and small trees approximately 1m to 3m in height were observed in the landscaped areas at the site. Based on a cursory inspection, visible stress or dieback were not observed from the onsite vegetation.

2.6 Surrounding Land Use

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

- North – Macdonald Street, residential apartments and HMAS Kuttabul located further to the north;
- South – Residential apartments with ground floor retail businesses including a hotel (Holiday Lodge), bar/restaurant (Yellow) and two dry cleaners (Challis Avenue Laundry & Dry Cleaning and Macleay Street Laundrette) located further to the south;
- East – Macleay Street, residential apartments and Elizabeth Bay located further to the east; and
- West – Macdonald Lane, residential apartments and Sydney Cove located further to the west.

JKE is of the opinion that the adjacent dry cleaners located to the south of the site is a potential off-site contamination source as the closest dry cleaner (Challis Avenue Laundry & Dry Cleaning) is located approximately 60m of the site boundary and is up-gradient (shown on Figure 2).

2.7 Underground Services

The 'Before You Dig Australia' (BYDA) plans were reviewed for the DSI in order to establish whether any major underground services exist at the site or in the immediate vicinity that could act as a preferential pathway for contamination migration.

The majority of the services were location along the north and east site boundaries outside the site. An electrical substation was located adjacent to the north site boundary and outside the site. A copy of the Ausgrid plan showing the substation is attached in the appendices. Major services were not identified that would be expected to act as preferential pathways for contamination migration.

2.8 Local Meteorology

Key meteorological data for Sydney Observatory weather station available on the Bureau of Meteorology (BOM)[11] website has been reviewed for the DSI. JKE note the following for 2022-23:

- The highest rainfall occurred in March 2022, with a total of 554mm;
- The lowest rainfall occurred in June 2022, with a total of 16.8mm; and
- In the lead up to the DSI, JKE note that the rainfall between May and July 2023 ranged from 17.8mm (June) to 61.6mm (May).

2.9 Section 10.7 Planning Certificate

The section 10.7 (2 and 5) planning certificates were reviewed for the PSI. A summary of the relevant information is outlined below:

- The land is not deemed to be: significantly contaminated; subject to a management order; subject of an approved voluntary management proposal; or subject to an on-going management order under the provisions of the CLM Act 1997;
- Council has not identified that a SAS has been received in respect to the land;
- The land is not located within a Class 1 or Class 2 ASS risk area;
- The land has not been identified as land that is within an environmentally sensitive area, buffer area or an ecologically sensitive area;
- The land has not been certified as biodiversity certified land under the Biodiversity Conservation Act 2016;
- The land has not been identified as being listed on the loose-fill asbestos insulation register; and
- The land has been identified as located within a heritage conservation area under the Sydney Local Environmental Plan (LEP) 2012.

[11] http://www.bom.gov.au/climate/averages/tables/cw_066062.shtml visited on 29 August 2023

2.10 Summary of Site History

Review of the site history information presented in the PSI report indicated the following:

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

Year(s)	On-site - Potential Land Use / Activities	Off-site - Potential Land Use / Activities
1930-1961	Site was occupied by a number of terraces. Site use was likely residential, possibly including commercial land use.	Predominantly residential including some commercial landuse. Circa 1942 – Land reclamation had commenced within an area located to the north-east of the site.
1961-1965	Redevelopment of the site occurred which included the demolition of onsite buildings followed by the construction of a multi-storey building. The majority of the open areas of the site appeared to have been surfaced by pavement.	Additional multi-storey buildings had been constructed within the site surrounds. Commercial landuse had increased.
1965-present	High-rise residential and hotel use.	Residential and commercial landuse.

2.11 Review of SafeWork NSW Records for Dangerous Goods

SafeWork NSW records in relation to the registered storage of dangerous goods were reviewed for the DSI. Copies of relevant documents are attached in the appendices. The search did not identify any licences to store dangerous goods including USTs, ASTs or chemicals at the site.

2.12 Summary of Regional Geology and Hydrogeology

2.12.1 Regional Geology

Review of regional geological information undertaken for the PSI indicates that the site is underlain by Hawkesbury Sandstone, which typically consists of medium to coarse grained quartz sandstone with minor shale and laminite lenses.

2.12.2 Acid Sulfate Soil (ASS) Risk and Planning

Review of ASS information undertaken for the PSI indicates that the site is located within a Class 5 ASS risk area. Works in a Class 5 risk area that could pose an environmental risk in terms of ASS include works within 500m of adjacent Class 1,2,3,4 land which are likely to lower the water table below 1m AHD on the adjacent Class 1,2,3,4 land. ASS Class 1 and 2 areas are located within 500m to the north, west and east of the site.

2.12.3 Hydrogeology

Hydrogeological information was reviewed for the PSI. The report indicates that the regional aquifer on-site and in the areas immediately surrounding the site includes porous, extensive aquifers of low to moderate productivity. There was a total of 64 registered bores within the report buffer of 2,000m. In summary:

- The nearest registered bore was located approximately 170m to the east of the site. This was utilised for domestic purposes;
- The majority of the bores were registered for monitoring and domestic purposes;
- There were no nearby bores (i.e. within 500m) registered for recreational or irrigation uses; and
- The drillers log information from the closest registered bores typically identified fill soil to depths of 0.5-1.5m, underlain by sandstone bedrock and deep sands. Standing water level (SWL) in the bores ranged from approximately 0.1mBGL to 1mBGL.

The information reviewed for the PSI indicates that the subsurface conditions at the site are likely to consist of relatively low permeability (residual) soils overlying shallow bedrock. The potential for viable groundwater abstraction and use of groundwater under these conditions is considered to be relatively low. There is a reticulated water supply in the area and consumption of groundwater is not expected to occur. Use of groundwater is not proposed as part of the development.

2.13 Receiving Water Bodies

Surface water bodies were not identified in the immediate vicinity of the site. The closest surface water body is Elizabeth Bay located approximately 170m to the east of the site. This is down-gradient from site and considered to be a potential receptor.

3 CONCEPTUAL SITE MODEL

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

Table 3-1: Review of CSM

Contaminant source(s) and contaminants of concern	**Potential contamination sources/contaminating activities:** fill material; use of pesticides; hazardous building materials from existing or former structures; and off-site dry cleaners with the closest one located approximately 60m to the south of the site (see Figure 2). **Contaminants of potential concern (CoPC)**: **Fill/soil:** Heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), petroleum hydrocarbons (referred to as total recoverable hydrocarbons – TRHs), benzene, toluene, ethylbenzene and xylene (BTEX), polycyclic aromatic hydrocarbons (PAHs), organochlorine pesticides (OCPs), organophosphate pesticides (OPPs), polychlorinated biphenyls (PCBs) and asbestos. **Soil vapour:** TRH/BTEX and naphthalene (BTEXN), and volatile organic compounds (VOCs), possibly including chlorinated solvents. **Groundwater:** Heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc); PAHs; TRHs; BTEX and VOCs. Based on the site inspection and historical assessment, JKE was of the opinion that there is a low potential for the site to have been used for activities associated with point sources of Per- and Polyfluoroalkyl Substances (PFAS) (as outlined in Appendix B of the PFAS National Environmental Management Plan 2020) [12]. Though it is noted that PFAS can be associated with dry cleaning practices due to water proofing on clothing and therefore PFAS was included in the DSI as a CoPC.
Affected media	Soil, soil vapour and groundwater have been identified as potentially affected media.
Receptor identification	Human receptors include site occupants/users (including adults and children), construction workers and intrusive maintenance workers. Off-site human receptors include adjacent land users, groundwater users and recreational water users within Elizabeth Bay. Ecological receptors include terrestrial organisms and plants within unpaved areas (including the proposed landscaped areas), and marine ecology in Elizabeth Bay.
Exposure pathways and mechanisms	Potential exposure pathways relevant to the human receptors include ingestion, dermal absorption and inhalation of dust (all contaminants) and vapours (volatile TRH, naphthalene, VOCs and BTEX). The potential for exposure would typically be associated with the construction and excavation works, and future use of the site. Potential exposure pathways for ecological receptors include primary contact and ingestion. Exposure during future site use could occur via direct contact with soil in unpaved areas such as gardens, inhalation of airborne asbestos fibres during soil disturbance, or inhalation of vapours within enclosed spaces such as buildings and basements.

[12] Heads of EPA Australia and New Zealand, (2020). *PFAS National Environmental Management Plan Version 2.0* (referred to as PFAS NEMP)

	Exposure to groundwater contamination is unlikely to occur in the Elizabeth Bay through direct migration as there would be some level of dilution as the water travels 170m to the bay. However, groundwater has the potential to enter the bay via the stormwater system (which is expected to discharge into the bay) in a drained basement scenario. The following have been identified as potential exposure mechanisms for site contamination: • Vapour intrusion into the proposed basement and/or building (either from soil contamination or volatilisation of contaminants from groundwater); • Contact (dermal, ingestion or inhalation) with exposed soils in landscaped areas and/or unpaved areas; • Contact with groundwater during construction, or possibly in the proposed basement in a drained basement scenario; • Migration of groundwater off-site and into nearby water bodies, including aquatic ecosystems and those being used for recreation; and • Migration of groundwater off-site into areas where groundwater is being utilised as a resource (i.e. for irrigation).
Presence of preference pathways for contaminant movement	None identified. To be reviewed in the event mobile contamination impacts are encountered.

4 SAMPLING, ANALYSIS AND QUALITY PLAN

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

- Data Quality Objectives (DQOs) were developed to define the type and quality of data required to achieve the project objectives outlined in Section 1.4;
- Soil samples for the DSI were obtained from a total of nine sampling locations which included seven boreholes (BH1 to BH3 and BH6 to BH9) and two test pits (TP5 and TP10) generally spread across the site, as shown on the attached Figure 2;
- Soil samples for the ASS screening was limited to three boreholes (BH1 to BH3) as should on Figure 2;
- Soil samples were obtained using a combination of hand tools and drill rig equipped with spiral flight augers (150mm diameter) and SPT sampler between 31 July and 1 August 2023;
- Three groundwater monitoring wells were installed in boreholes BH1 (MW1), BH2 (MW2), and BH3 (MW3) during the DSI, as shown on Figure 2. The wells were generally positioned to identify any potential impacts from groundwater flowing from off-site contamination sources located to the south of the site;
- The monitoring well construction details are documented on the borehole log for BH1, BH2 and BH3 attached in the appendices;
- Soil vapour samples were obtained from five sub-slab pins (SV1 to SV5) as shown on Figure 2. The pins were generally positioned to identify any potential impacts from off-site contamination sources located to the south of the site;
- The monitoring wells were developed on 4 August 2023. All wells were developed (i.e. water was pumped out) until they were effectively dry using a submersible electrical pump. The field monitoring records and calibration data are included in the appendices;
- The monitoring wells were allowed to recharge for five days after development. Groundwater samples were obtained on 10 August 2023. Steady state conditions were achieved in MW1 during sampling. Sampling from MW2 and MW3 was undertaken during draw down due to slow recharge. The field monitoring records and calibration data are attached in the appendices; and
- The SAC adopted for assessing the DSI results are outlined in the SAQP.

4.1 Deviations to the SAQP

The following deviations to the SAQP are noted:

- The intent was to, where practicable, position the soil sampling locations on a systematic plan with a grid spacing of approximately 15m between sampling locations as outlined in the SAQP. However, due to onsite obstructions including buildings, structures, buried services, and client requests to minimise disruptions to the existing tenants, the sampling locations were ultimately placed on a judgemental sampling plan and were broadly positioned for site coverage. This sampling plan was considered suitable to make an assessment of potential risks associated with the AEC and CoPC identified in the CSM, and assess whether further investigation/remediation is warranted;
- Sampling was not undertaken from TP4 which was excavated by JKG to expose the footings associated with the adjacent property located to the south of the site;
- The fill was not fully penetrated in BH7, BH9 and BH10 due to hand auger refusal, however, it was inferred that the refusal occurred on sandstone bedrock;

- Asbestos bulk quantification/field screening did not occur from BH2, BH3, BH8 and BH9. Sandstone bedrock was encountered directly under the pavement in BH2 and BH3. Adequate sample return could not be obtained from BH8 and BH9 due to the shallow nature of the fill profiles which inhibited the collection of an adequate bulk sample;
- The sample volumes for asbestos bulk quantification/field screening for a limited number of samples was below 10L. The low volume was due to the use of augers which limited the sample return particularly in subsurface fill profiles; and
- Due to concerns regarding the reinstatement of test pits, test pitting was limited to the existing garden bed located in the south-east section of the site.

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

4.2 Laboratory Analysis

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

Table 4-1: Laboratory Details

Samples	Laboratory	Report Reference
All primary samples and field QA/QC samples including (intra-laboratory duplicates, trip blanks, trip spikes, shroud and field rinsate samples)	Envirolab Services Pty Ltd NSW, NATA Accreditation Number – 2901 (ISO/IEC 17025 compliance)	329656, 329656-A, 329662, 329662-A, 330183 and 329836.
Inter-laboratory duplicates	Envirolab Services Pty Ltd VIC, NATA Accreditation Number – 2901 (ISO/IEC 17025 compliance)	38969 and 39094

5 RESULTS

5.1 Summary of Data (QA/QC) Evaluation

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

5.2 Subsurface Conditions

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

Table 5-1: Summary of Subsurface Conditions

Profile	Description
Pavement	Concrete pavement was encountered at the surface at majority of the locations and ranged in thickness from approximately 100mm to 200mm. Pavement was not encountered in TP3, BH7 and TP10.
Fill	Fill was encountered at the surface or beneath the pavement in majority of the boreholes and test pits and extended to depths of approximately 0.15mBGL to 0.85mBGL. BH7, BH9 and TP10 were terminated in the fill at a maximum depth of approximately 0.65mBGL. Fill was not encountered in BH3. Granular road base was encountered in BH2 below the concrete pavement. The fill typically comprised silty sand and silty clayey sand with inclusions of igneous and sandstone gravel, slag, roots and root fibres, trace of brick, concrete and plastic fragments and clay fine. Staining and/or odours were not detected in the fill soil.
Natural Soil	Natural soil was not encountered in the boreholes or test pits during the investigation.
Bedrock	Sandstone bedrock was encountered in BH1, BH2, BH3, TP4, TP5, BH6 and BH8. The sandstone was fine to coarse grained and yellow brown, orange brown and light grey to grey.
Groundwater	Groundwater seepage was not encountered in the boreholes during the investigation. Seepage was encountered in TP5 at a depth of approximately 0.8mBGL. Standing Water Level (SWL) encountered in the monitoring wells installed at the site is discussed further below.

5.3 Field Screening

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

Table 5-2: Summary of Field Screening

Aspect	Details
PID Screening of Soil Samples for VOCs	PID soil sample headspace readings are presented in attached report tables and the COC documents attached in the appendices. PID results ranged from 0ppm to 3.1ppm generally indicating low PID detections. Samples with high PID readings were analysed for TRH and BTEX.

Aspect	Details
Bulk Screening for Asbestos	The bulk field screening results are summarised in the attached report Table S5. All results were below the SAC. Suspected asbestos containing material (ACM) was not observed in any sample.
Groundwater Depth & Flow	SWLs measured in the monitoring wells installed at the site ranged from approximately 0.99mBGL to 2.19mBGL. The SWLs indicate that excavation for the proposed basement is anticipated to intercept groundwater. The groundwater is considered to flow to the west and south-west of the site.
Groundwater Field Parameters	Field measurements recorded during sampling were as follows: - pH ranged from 4.74 to 6.54; - EC ranged from 169.7µS/cm to 416.8µS/cm; - Eh ranged from -62.7mV to -190.9mV; and - DO ranged from 1.3ppm to 10.4ppm. The PID readings in the monitoring well headspace recorded during sampling ranged from 0.4ppm in MW3 to 14ppm in MW1.
LNAPL petroleum hydrocarbons	Phase separated product (i.e. LNAPL and DNAPL) was not detected using the interphase probe during groundwater sampling.

5.4 Soil Laboratory Results

The soil laboratory results were assessed against the SAC presented in the SAQP. Individual SAC are shown in the report tables attached in the appendices. A summary of the results is presented below:

5.4.1 Human Health and Environmental (Ecological) Assessment

Table 5-3: Summary of Soil Laboratory Results – Human Health and Environmental (Ecological)

Analyte	N	Max. (mg/kg)	N> Human Health SAC	N> Ecological SAC	Comments
Arsenic	19	<4	0	0	-
Cadmium	19	1	0	NSL	-
Chromium (total)	19	26	0	0	-
Copper	19	110	0	0	-
Lead	19	370	0	0	-
Mercury	19	0.3	0	NSL	-
Nickel	19	27	0	0	-
Zinc	19	410	0	0	-
Total PAHs	19	190	0	NSL	-

Analyte	N	Max. (mg/kg)	N> Human Health SAC	N> Ecological SAC	Comments
Benzo(a)pyrene	19	20	NSL	0	-
Carcinogenic PAHs (as BaP TEQ)	19	26	1	NSL	Fill sample BH7 (0.3-0.4m) encountered an elevated concentration of Carcinogenic PAHs of 26mg/kg which was above the human health SAC of 4mg/kg. The concentration is greater than 250% of the SAC.
Naphthalene	19	<1	0	NSL	-
DDT+DDE+DDD	13	<0.1	0	NSL	-
DDT	13	<0.1	NSL	0	-
Aldrin and dieldrin	13	<0.1	0	NSL	-
Chlordane	13	<0.1	0	NSL	-
Heptachlor	13	<0.1	0	NSL	-
Chlorpyrifos (OPP)	13	<0.1	0	NSL	-
PCBs	13	0.9	0	NSL	-
TRH F1	19	<25	0	0	-
TRH F2	21	110	0	0	-
TRH F3	21	2,800	0	5	Fill samples BH7 (0.3-0.4m) and TP10 (0-0.1m, and associated field duplicate SDUP5), encountered elevated concentrations of TRH F3 ranging from 590mg/kg to 2,800mg/kg which were above the ecological SAC of 300mg/kg. The fill samples were re-analysed for TRH F3 after silica gel clean-up and the results ranged from <100mg/kg (PQL) in BH7 (0.3-0.4m) to 1,000mg/kg in TP10 (0-0.1m). The TRH F3 concentration in TP10 (0-0.1m) post clean-up was above the ecological SAC of 300mg/kg.

Analyte	N	Max. (mg/kg)	N> Human Health SAC	N> Ecological SAC	Comments
TRH F4	21	1300	0	0	-
Benzene	19	<0.2	0	0	-
Toluene	19	<0.5	0	0	-
Ethylbenzene	19	<1	0	0	-
Xylenes	19	<1	0	0	-
PFOS (µg/kg)	12	14	NSL	0	-
PFOS + PFHxS (µg/kg)	12	15	0	NSL	-
PFOA (µg/kg)	12	1	0	0	-
Asbestos (in soil) (%w/w)	9	ACM <0.01 AF/FA <0.001	0	NA	-

Notes:

N: Total number of samples including primary samples, field, and lab duplicates

NSL: No set limit

NL: Not limiting

5.4.2 Waste Classification Assessment

The laboratory results were assessed against the criteria presented in the SAQP. The results are presented in the report tables attached in the appendices. A summary of the results is presented in the following table:

Table 5-4: Summary of Soil Laboratory Results Compared to CT and SCC Criteria

Analyte	N	N > CT Criteria	N > SCC Criteria	Comments
Arsenic	19	0	0	-
Cadmium	19	0	0	-
Chromium	19	0	0	-
Copper	19	NSL	NSL	-
Lead	19	5	0	Lead concentrations exceeded the CT1 criterion in three fill samples collected from TP5 (0.1-0.2m), BH7 (0.3-0.4m) and TP10 (0-0.1m and associated lab and field duplicates). The maximum lead concentration was 370mg/kg.
Mercury	19	0	0	-

Analyte	N	N > CT Criteria	N > SCC Criteria	Comments
Nickel	19	0	0	-
Zinc	19	NSL	NSL	-
TRH (C_6-C_9)	19	0	0	-
TRH (C_{10}-C_{36})	21	0	0	-
BTEX	19	0	0	-
Total PAHs	19	0	0	-
Benzo(a)pyrene	19	1	1	The benzo(a)pyrene concentration exceeded the CT1 and SCC1 criteria in fill sample BH7 (0.3-0.4m), with a concentration of 20mg/kg.
OCPs & OPPs	13	0	0	-
PCBs	13	0	0	-
PFOS + PFHxS	12	NSL	0	-
PFOA	12	NSL	0	-
Asbestos	9	-	-	Asbestos was not detected in the samples analysed.

N: Total number of samples including primary samples, field, and lab duplicates
NSL: No set limit

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

Analyte	N	N > TCLP Criteria	Comments
Lead	3	0	The three primary fill samples with lead concentrations above the CT1 criterion were analysed for TCLP lead. All of the results were below the TCLP1 criterion.
Benzo(a)pyrene	1	0	Fill sample BH7 (0.3-0.4m) with benzo(a)pyrene concentration above the CT1 and SCC1 criteria was analysed for TCLP PAHs including benzo(a)pyrene. The result was below the TCLP1 criterion.

N: Total number (primary samples)

Samples were not analysed for TCLP PFAS and this is discussed further in Section 6.

5.4.3 Acid Sulfate Soil Assessment

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

Table 5-6: Summary of ASS Results

Analysis	N	Comments
pH_F and pH_{FOX}	5	The pH_F results ranged from 5.6 to 8.6 and pH_{FOX} from 4.1 to 6.8. All results were above pH 4 which indicate that the samples were not actual ASS.
pH_{FOX} reaction rates	5	The pH_{FOX} reaction rates ranged from low to medium with a difference in pH_F - pH_{FOX} ranging from -0.5 to 1.8.
Net Acidity % S-equiv.	5	The Net Acidity % S-equiv results ranged from 0.006%w/wS to 0.052%w/wS. Sandstone sample BH3 (1-1.1m) encountered a result of 0.052%w/wS above the action criterion of 0.03%w/wS.
Net Acidity mol H^+/t	5	The Net Acidity mol H+/t results ranged from <5 mol H^+/t to 32 mol H^+/t. Sandstone sample BH3 (1-1.1m) encountered a result of 32 mol H^+/t above the action criterion of 18 mol H^+/t.
S_{CR}%	5	The S_{CR}% results ranged from <0.005% to 0.01%.
Liming Rate	5	The liming rate required for neutralisation ranged from <0.75 kg$CaCO_3$/tonne to 2.4 kg$CaCO_3$/tonne.

N: Total number (primary samples)

5.4.4 Statistical Analysis

Although statistical analysis formed part of the DQOs as set out in the SAQP, the sampling plan was altered due to access constraints and the outcome was that it was not probabilistic. On this basis, the statistical approach proposed in the SAQP is not strictly applicable.

Notwithstanding, we have undertaken 95% upper confidence limit (UCL) calculations and combined risk value (CRV) calculations using the available Carcinogenic PAHs fill data. The statistical analysis is preliminary and has been used as a line of evidence in assessing risks as part of the Tier 1 risk assessment process for human receptors. A summary of these calculations is presented below:

5.4.4.1 UCL calculations

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

Table 5-7: Summary of 95% UCL calculations

Analyte	N	Standard Deviation (mg/kg)	95% UCL (mg/kg)	Comment
Carcinogenic PAHs	11	14.55	7.77	Both the UCL and the standard deviation greater than the HIL-B SAC of 4mg/kg. The standard deviation was also greater than 50% of the SAC.

Notes:

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

5.4.4.2 Combined Risk Value Method (CRV)

CRV calculations were undertaken for the Carcinogenic PAHs in fill soil data with reference to Section 7.2 of the NSW EPA Sampling Design Part 1 – Application (2022)[13], Contaminated Land Guidelines. The CRV method is used to assess the minimum number of samples required to have an acceptable level of certainty around making Type I or Type II decision errors in determining whether or not a site is or is not contaminated (i.e. whether the power of the statistical tests is sufficient). As the final sampling plan was non-probabilistic and there are data gaps associated with the existing buildings/structures etc, these statistical tests are preliminary in nature and have been used as a line of evidence in the Tier 1 risk assessment, rather than in the assessment of decision errors.

The number of samples (n) required for assessing Carcinogenic PAHs, calculated using the CRV method, was 49 samples. The number of samples (n) is substantial and is greater than the number of samples analysed for the DSI. This is due to the variability in the data which is primarily attributed to the outlier concentration of 26mg/kg for Carcinogenic PAHs in BH7 (0.3-0.4m), which in itself was substantially greater than 250% of the SAC.

5.5 Groundwater Laboratory Results

The groundwater laboratory results were assessed against the SAC presented in the SAQP. Individual SAC are shown in the report tables attached in the appendices. A summary of the results is presented below:

Table 5-8: Summary of Groundwater Laboratory Results – Human Health and Environmental (Ecological)

Analyte	N	Max. (µg/L)	N> Human Health SAC	N> Ecological SAC	Comments
Arsenic	8	1	0	0	-
Cadmium	8	<0.1	0	0	-
Chromium (total)	8	2	0	0	-
Copper	8	7	0	6	The copper results for all groundwater samples and associated lab and field duplicates were above the ecological SAC of 1.3µg/L.

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

Analyte	N	Max. (µg/L)	N> Human Health SAC	N> Ecological SAC	Comments
Lead	8	1	0	0	-
Mercury	8	3	0	1	Groundwater sample SDUP2 (field duplicate of primary sample MW2) encountered a total mercury concentration of 3µg/L above the ecological SAC of 0.1µg/L.
Nickel	8	25	0	1	Groundwater sample SDUP2 (field duplicate of primary sample MW2) encountered a nickel concentration of 25µg/L, above the ecological SAC of 7µg/L.
Zinc	8	23	0	4	Groundwater samples MW1 and MW2 (and associated field and lab duplicates) encountered zinc concentration above the ecological SAC of 15µg/L.
Total PAHs	6	<0.1	0	0	-
Benzo(a)pyrene	6	<0.1	0	0	-
Naphthalene	6	<0.2	0	0	-
TRH F1	6	<10	0	NSL	-
TRH F2	6	<50	0	NSL	-
TRH F3	6	<100	NSL	NSL	-
TRH F4	6	<100	NSL	NSL	-
Benzene	6	3	3	0	Groundwater sample MW2 and associated lab and field duplicates (SDUP2) encountered a benzene concentration of 3µg/L above the human health SAC in relation to vapour intrusion, i.e. the Health Screening Level Site Specific Assessment (HSL-SSA) criteria.
Toluene	6	<1	0	0	-
Ethylbenzene	6	<1	0	0	-
m+p-Xylene	6	<2	0	0	-
o-Xylene	6	<1	0	0	-

Analyte	N	Max. (µg/L)	N> Human Health SAC	N> Ecological SAC	Comments
Total Xylenes	6	<3	0	0	-
VOCs (other than BTEX) - Chloroform	6	2	0	0	-
PFOS	7	0.047	NSL	0	-
PFOS + PFHxS	7	0.061	0	NSL	-
PFOA	7	0.027	0	0	-
pH	3	5.7-7.6	2	2	The pH for samples MW1 and MW2 was outside the ecological and human health SAC.
EC	3	420	NSL	NSL	-

Notes:

N: Total number of samples including primary samples, field, and lab duplicates

NSL: No set limit

NL: Not limiting

5.6 Soil Vapour Assessment

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

Table 5-9: Summary of Soil Vapour Laboratory Results – Human Health

Analyte	N	Max. (mg/m^3)	N> Human Health SAC	Comments
TRH F1	7	<0.2	0	-
TRH F2*	7	0.14	0	-
Benzene	7	0.002	0	-
Toluene	7	0.01	0	-
Ethylbenzene	7	<0.0022	0	-
Total Xylenes	7	<0.0065	0	-
Naphthalene	7	<0.0026	0	-

Analyte	N	Max. (mg/m^3)	N> Human Health SAC	Comments
<u>VOCC</u> TCE 1,1,1-TCA PCE Cis 1,2 dichloroethene Vinyl chloride	7	 0.004 <0.0027 <0.0034 <0.002 <0.0013	0	All VOCC concentrations with NEPM (2013) interim HIL-A/B SAC were below the SAC.
<u>VOC (µg/m^3)</u> Propylene Ethanol Acetone Isopropyl Alcohol Ethyl Acetate Chloroform 1,2,4 Trimethylbenzene	7	 3 150 150 510 20 8 4	0	All VOC detectable concentrations (i.e. those >PQL) were below the USEPA SAC.

<u>Notes:</u>

N: Total number of samples including primary samples, field, and lab duplicates

*TRH F2 is TRH C_{10}-C_{12} only which is a consequence of the TO-15 analytical method

6 PRELIMINARY WASTE CLASSIFICATION ASSESSMENT

6.1 Preliminary Classification of Fill

Based on the results of the DSI, and at the time of reporting, the fill material is assigned a preliminary classification of **Restricted Solid Waste (non-putrescible)** at BH7 and **General Solid Waste (non-putrescible)** across the remainder of the locations. The waste classification of fill must be finalised via additional sampling and analysis using test pits following demolition of the building and pavements. The test pitting must include bulk asbestos quantification in addition to the typical sampling/analysis expected for waste classifications.

During the final waste classification process, close inspection of the soils at BH7 should occur for the potential presence of ash or slag as this may enable the classification to consider the respective General Approvals of Immobilisation which in our experience may facilitate a reduction in the waste classification at BH7 to General Solid Waste (non-putrescible). Slag was encountered in the fill at other locations at the site during the DSI.

The preliminary waste classification did not include leachate analysis for PFAS. However, the PFAS concentrations reported in the soils were very low and in our opinion there is a high likelihood that leachate concentrations will confirm that, in relation to PFAS, the waste falls within the General Solid Waste (non-putrescible) category. This is to be confirmed as part of the final waste classification process.

Fill should be disposed of to a facility that is appropriately licensed by NSW EPA to receive the waste stream. The facility should be contacted to obtain the required approvals prior to commencement of excavation.

6.2 Preliminary Classification of Bedrock

Based on the results of the DSI, and at the time of reporting, further assessment of the bedrock will be required to finalise the waste classification for this waste stream. Due to the presence of benzene in the groundwater and PAH contamination in the overlying fill, the waste classification for natural soils and bedrock must occur following removal of the fill and further assessment of the presence of contaminants in the groundwater.

Where a virgin excavated natural material (VENM) classification cannot be achieved, alternative classification(s) under the resource recovery exemption process should be considered in order to maximise the re-use potential for the natural material and reduce waste disposal costs.

7 DISCUSSION

7.1 Tier 1 Risk Assessment and Review of CSM

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

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

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

7.1.1 Soil

7.1.1.1 Human Health Risk

Carcinogenic PAHs were detected in fill soil at a concentration above the health-based SAC in one location (refer to Figure 3). The source of the PAHs is considered likely to be associated with slag inclusions encountered in the fill soil at the site. It is also possible that trace quantities of ash are present in fill as this is common within the inner Sydney suburbs.

The vertical extent of PAH contamination is likely to be limited to the depth of fill at the location (approximately 0.65mBGL). Considering the site access limitations, the horizontal extent could not be determined in detail during, though it is noted that the high concentrations of PAHs were not detected in the nearest surrounding boreholes.

Statical calculations were run on the fill dataset for Carcinogenic PAHs. The 95% UCL for Carcinogenic PAHs was above the SAC, the standard deviation was greater than 50% of the SAC and the concentration in BH7 was greater than 250% of the SAC.

The elevated Carcinogenic PAHs concentration in BH7 was in a subsurface soil profile and the overlying profile did not report PAH concentrations greater than the SAC. On this basis, there is not considered to be a complete SPR linkage in the current site configuration whilst the fill in this area remains undisturbed. Given BH7 and the surrounding areas fall within the proposed basement footprint, it is expected that the contaminated fill will be removed during the construction process and therefore potential risks from a complete SPR linkage in the context of the proposed development are considered to be low. Notwithstanding, in our opinion the contaminated fill is to be remediated under the provisions of a RAP and the RAP will also include provisions for managing the data gaps.

We note that the 'commercial/industrial' SAC presented in the NEPM (2013) for Carcinogenic PAHs is 40mg/kg and the highest reported concentration in BH7 was 26mg/kg which is well below this level. Whilst the 'commercial/industrial' SAC are not occupational exposure criteria that apply to all activities such as intensive earthmoving and construction, in our opinion, risks to construction works are likely to be low and acceptable if good hygiene and construction management practices are implemented (e.g. dust control, hand washing etc).

7.1.1.2 Ecological Risk

TRH F3 was encountered in fill soil above the ecological SAC in two locations during the DSI. Silica-gel cleanup results indicated a general decrease in the TRH F3 and F4 concentrations in both samples indicating a non-petroleum source of TRH likely exists. This is also supported by the absence of staining, TRH odours and high PID results in the soil samples. The presence of slag in the fill soil can also be a potential source for mid-heavy fraction TRH at the site.

The majority of the fill soil will be excavated during the proposed basement excavation and the proposed development will include importation of landscaping material which will reduce the risk to future ecological receptors. The occurrence of TRHs in fill can be addressed via provisions in the RAP and the RAP should include importation criteria for landscaping material required for the proposed development.

7.1.1.3 Other CoPC

FCF/ACM was not encountered in the fill material at the site during the DSI field work. No asbestos was detected in any of the soil samples analysed for the DSI. However, JKE note that sampling was not undertaken beneath existing buildings and structures due to access limitations. Further investigation will be required to assess the potential impact of asbestos in/on fill at the site following demolition of the existing buildings/structures and for waste classification purposes. This can be addressed by including provisions in the RAP and is to include additional sampling from test pits to provide a higher confidence in relation to the potential occurrence of asbestos in fill.

Due to live services associated with the off-site electrical substation, sampling in the vicinity of the substation was not undertaken. Further localised assessment of residual contamination associated with the substation is considered to be required. This can be addressed by including provisions in the RAP.

Elevated concentrations of the remaining CoPC were below the adopted SAC in the soil samples analysed during the investigation. Although below the human health SAC, it is noted that PCBs were detected in some fill samples. Additional testing of fill and natural soil/bedrock for waste classification should include testing for PCBs.

7.1.2 Soil Vapour

All TRH/BTEX and VOCC results were below the SAC. Detectable VOC concentrations were also compared to the USEPA SAC and all results were below the SAC. The results indicate that the potential for migration of VOCs from the drycleaner located approximately 60m to the south of the site is low and vapour intrusion risks are expected to be low and acceptable in the context of the proposed development.

7.1.3 Groundwater

7.1.3.1 Human Health Risk

Groundwater sample MW2 and associated lab and field duplicates encountered elevated concentration of benzene above the HSL-SSA (refer to Figure 5). The concentration was marginally above the HSL-SSA. The samples also detected chloroform. Soil vapour sample SV1 located in the vicinity of the MW2 also detected traces of benzene at concentrations that were well below the SAC. As the groundwater at MW2 was relatively shallow, we consider that the soil vapour results are representative of the volatilisation risks associated with traces of benzene in groundwater. The benzene in soil vapour concentrations were orders of magnitude below the soil vapour SAC, therefore in our opinion the risks from benzene in groundwater (in the context of vapour intrusion) are likely to be low and acceptable in the context of the proposed development. Notwithstanding, provisions for additional groundwater sampling and assessment will be included in the RAP to confirm this assessment, as noted below.

The potential source of these benzene detections can be associated with localised leaks form the sewer main located to the immediate west of the site. A copy of the Sydney Water plan showing the sewer main is attached in the appendices.

The benzene concentrations in groundwater did not exceed the recreational SAC and therefore are not considered to pose an unacceptable risk to on-site receptors as a result of incidental contact during construction, or to recreational water users in down-gradient water bodies.

JKE is of the opinion that an additional round of groundwater sampling and analysis should be undertaken in order to better assess the groundwater conditions. This can be addressed by including provisions in the RAP. Based on the results of the additional testing, consideration can be made for a Tier 2 Human Health Risk Assessment (HHRA) if deemed necessary.

7.1.3.2 Ecological Risk

The groundwater samples encountered concentrations of copper, mercury, nickel and zinc above the ecological SAC (refer to Figure 3). The copper and zinc exceedances were generally consistent across the monitoring wells and are considered to be associated with regional factors.

The nickel and mercury concentration in field duplicate of MW2 may be attributed to localised leaks form the sewer main. However, we note that the exceedance of the ecological SAC is minor and there are no nearby receiving waterbodies which could be easily impacted via subsurface groundwater migration, particularly as the groundwater will mix with other groundwater before entering the bay. Risks may increase where discharge of groundwater occurs to the stormwater system (which is expected to discharge into the bay), however, this is a construction-phase risk that is expected to be managed as part of the dewatering process.

The pH of the groundwater from MW1 and MW2 was outside the range generally accepted for both human health and ecological receptors.

The benzene concentrations were also well below the marine ecological SAC.

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

7.1.3.3 Other CoPC in Groundwater

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

The results indicate that the potential for migration of groundwater impacted by CoPC from the drycleaner located approximately 60m to the south of the site is low.

7.2 Acid Sulfate Soil Assessment

The site is located in an area of 'no known occurrence' for ASS materials with regards to the risk map prepared by Department of Land and Water Conservation (1997)[14], and is underlain by shallow Hawkesbury Sandstone. The site is also within a Class 5 risk area according to the planning maps, which essentially means that environmental risks would only be expected to materialise if a development was to lower the water table on adjoining land where ASS materials exist. The nearest Class 1 and Class 2 risk areas are located in the bay sediments or in the low-lying land to the east and west of the site, all of which are over approximately 150m away and at a substantially lower elevation. The proposed development will include excavation into rock and it is not plausible that any required construction-phase dewatering will likely lower the water table below 1m AHD on the adjacent Class 1 or 2 land, to pose an environmental risk in relation to the oxidation/disturbance of ASS materials.

ASS-related analysis for the DSI only occurred as a consequence of comments made by the site auditor in the IAA. As the investigation identified shallow fill over bedrock, and because the fill was not consistent with dredged materials, only a limited selection of bedrock samples was analysed. The results of the field tests and other laboratory results identified acidic conditions greater than the action criteria. However, these results are considered to be indicative of natural organic/humic material in the rock rather than ASS materials.

Considering the above, risks from the disturbance of actual or potential ASS materials are considered to be very low in the context of the proposed development. Therefore, an ASSMP is not considered necessary for the proposed development.

7.3 Decision Statements

The decision statements are addressed below:

> *Did the site inspection, or does the historical information identify potential contamination sources/AEC at the site?*

Yes, as outlined in the CSM in Section 3.

[14] Department of Land and Water Conservation, (1997). *1:25,000 Acid Sulfate Soil Risk Map – Prospect Parramatta (Series 9130N3, Ed 2)*

Are any results above the SAC?

Yes, the DSI identified elevated concentrations of CoPC above the SAC in selected soil and groundwater samples as discussed in Section 7.1.

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

Risks from contamination were generally assessed to be low, however, the fill soils must be remediated in accordance with a RAP due to the occurrence of PAHs and TRHs which could pose a potential risk if the fill were to remain on site. The RAP is to outline provisions for additional sampling/analysis to refine and confirm the assessment of risk discussed in Section 7.1.

Is remediation required?

Yes.

Is the site characterisation sufficient to provide adequate confidence in the above decisions?

Yes, as discussed above, a RAP should be prepared for the site.

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

Refer to Section 6.

Is there a potential for disturbing ASS materials during the proposed development and is an ASSMP required for the proposed development?

The potential for disturbing ASS materials in the context of the proposed development is low and an ASSMP is not considered to be required. Refer to Section 7.2.

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

JKE is of the opinion that the site can be made suitable for the proposed development outlined in Section 1.3, via remediation.

7.4 Review of CSM and Data Gaps

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

Table 7-1: Review of CSM and Data Gap Assessment

Source/AEC	Review of CSM and Data Gap Assessment
Sampling of fill material	Due to the access constraints, probabilistic/grid-based sampling was not practicable on this site. It is also noted that sampling occurred mainly from boreholes which poses limitation for identifying asbestos in fill, and sampling was not undertaken beneath the buildings/structures and in some areas which was subject to legal constraints associated with existing tenants. Further investigation of the fill will be required following demolition of the buildings/structures and when access becomes available to assess the full extent of risks associated with this AEC. However, in our opinion, we consider it is likely that the fill conditions beneath the buildings will be consistent with those encountered in the DSI. It is recommended that additional sampling is undertaken from test pits if practicable. In our opinion, this work can be incorporated into the requirements under the RAP and this data gap does not alter the DSI conclusions.
Use of Pesticides	Sampling beneath the building/structure footprint and/or in close proximity to the building/structure was not undertaken due access constrains. Further investigation of the fill/soils beneath the buildings/structures will be required to assess the full extent of risks associated with this AEC. In our opinion, this work can be incorporated into the requirements under the RAP and this data gap does not alter the DSI conclusions.
Additional Groundwater Sampling	Based on the results of the DSI, JKE is of the opinion that an additional round of groundwater sampling and analysis should be undertaken to assess the conditions. The analysis should also include the mandatory testing parameters outlined in Table A2 of the NSW Government *Minimum requirements for building site groundwater investigations and reporting, information for developers and consultants* (2022) document, in order to assess groundwater treatment requirements during temporary dewatering associated with the basement excavation. If there is any uncertainty regarding the final risk assessment relating to groundwater, a site-specific risk assessment is to occur.
Hazardous Building Materials	The buildings and structures on the site are of an age indicative of housing hazardous building materials (i.e. asbestos fibre cement and lead paint). JKE is not aware of a hazardous building materials register for the site. Further investigation of the fill will be required to assess the full extent of contamination risks on site as noted above.
Off-site drycleaner	Based on the reported results, and at the time of reporting, risks associated with this AEC are considered to be low and do not require further assessment.
Waste Classification	Additional/confirmatory waste classification assessment is required as discussed in Section 6.

8 CONCLUSIONS AND RECOMMENDATIONS

The DSI included a review of existing project information, a site inspection, soil sampling from nine locations including seven boreholes and two test pits, soil vapour sampling from five sub-slab vapour pins and groundwater sampling from three monitoring wells. The following potential contamination sources were identified at the site: fill material; use of pesticides; hazardous building materials from existing or former structures; and off-site dry cleaners with the closest one located approximately 60m to the south of the site.

The sampling locations encountered fill materials to depths of approximately 0.15mBGL to 0.85mBGL, underlain by sandstone bedrock. The sandstone was at shallow depths occurring below the concrete pavement in BH3. The fill contained inclusions of igneous and sandstone gravel, slag, roots and root fibres, trace of brick, concrete and plastic fragments and clay fine. There was no FCF/ACM identified in any of the bulk asbestos quantification field screening samples.

The DSI identified potential health risks associated with Carcinogenic PAHs in fill soil. Potential ecological risks from TRHs in fill soil were also identified. Risks associated with soil vapour and groundwater were assessed to be low based on the DSI data. Further sampling and risk assessment is required and this is to occur under the provisions of the RAP as noted below.

The DSI identified that remediation of the site will be required. Additional investigation is also required to address the data gaps identified in Section 7.4. However, we consider that it would be reasonable to include the requirements for further investigation within the RAP because a large portion of this work will need to occur after demolition. It is expected that remediation will include the removal/off-site disposal of fill associated with the basement excavation.

JKE is of the opinion that the site can be made suitable for the proposed development via remediation. The DSI recommends the following mitigation measures:

1. Preparation and implementation of a RAP. The RAP must include a data gap investigation (DGI) to address the data gaps identified in Section 7.4; and
2. Preparation of a validation assessment report for the remediation works undertaken at the site.

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

Based on the DIS results, JKE is of the opinion that the site contamination does not trigger the requirements to notify the NSW EPA under NSW EPA Guidelines on the Duty to Report Contamination under Section 60 of the CLM Act 1997 (2015)[15], and provided the recommendations outlined in the DSI are implemented.

JKE consider that the report objectives outlined in Section 1.4 have been addressed.

[15] NSW EPA, (2015). *Guidelines on the Duty to Report Contamination under Section 60 of the CLM Act 1997* (referred to as Duty to Report Contamination)

9 LIMITATIONS

The report limitations are outlined below:

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

Important Information About This Report

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

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

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

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

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

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

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

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

Misinterpretation of Site Investigations by Design Professionals

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

Logs Should not be Separated from the Investigation Report

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

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

Read Responsibility Clauses Closely

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

Appendix A: Report Figures

AERIAL IMAGE SOURCE: MAPS.AU.NEARMAP.COM

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

Title:	SITE LOCATION PLAN
Location:	45-53 MACLEAY STREET, POTTS POINT, NSW
Project No: E34303B	Figure No: 1

JKEnvironments

PLOT DATE: 10/09/2021 10:01:45 AM DWG FILE: Z:\5 EIS\5C EIS JOBS\34000'S\E34303B POTTS POINT\CAD\E34303B.DWG

LEGEND

(red dashed line)	APPROXIMATE SITE BOUNDARY
BH(Fill Depth)	BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m)
TP(Fill Depth)	TEST PIT LOCATION, NUMBER AND DEPTH OF FILL (m)
SV1	SOIL VAPOUR PIN LOCATION AND NUMBER

AERIAL IMAGE SOURCE: MAPS.AU.NEARMAP.COM

0 3 6 9 12 15

SCALE 1:300 @A3 METRES

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

Title: **SAMPLE LOCATION PLAN**

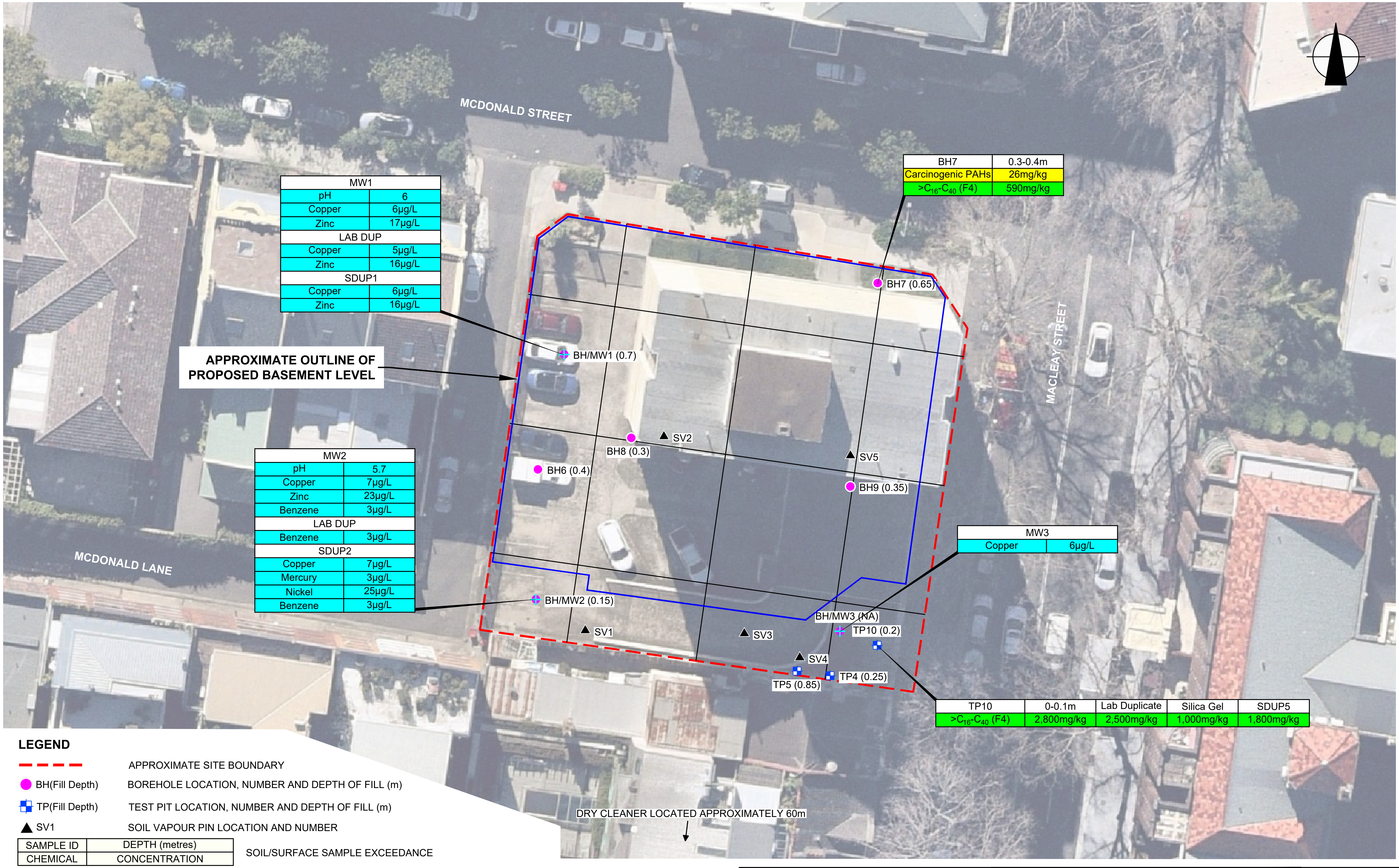
Location: 45-53 MACLEAY STREET, POTTS POINT, NSW

Project No: E34303B

Figure No: 2

JKEnvironments

PLOT DATE: 27/10/2025 2:43:02 PM DWG FILE: K:\SC EIS JOBS\34000'S\E34303B POTTS POINT\CAD\E34303B.DWG



MW1	
pH	6
Copper	6µg/L
Zinc	17µg/L
LAB DUP	
Copper	5µg/L
Zinc	16µg/L
SDUP1	
Copper	6µg/L
Zinc	16µg/L

BH7	0.3-0.4m
Carcinogenic PAHs	26mg/kg
$>C_{16}-C_{40}$ (F4)	590mg/kg

MW2	
pH	5.7
Copper	7µg/L
Zinc	23µg/L
Benzene	3µg/L
LAB DUP	
Benzene	3µg/L
SDUP2	
Copper	7µg/L
Mercury	3µg/L
Nickel	25µg/L
Benzene	3µg/L

MW3	
Copper	6µg/L

TP10	0-0.1m	Lab Duplicate	Silica Gel	SDUP5
$>C_{16}-C_{40}$ (F4)	2,800mg/kg	2,500mg/kg	1,000mg/kg	1,800mg/kg

LEGEND

- APPROXIMATE SITE BOUNDARY
- BH(Fill Depth) — BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m)
- TP(Fill Depth) — TEST PIT LOCATION, NUMBER AND DEPTH OF FILL (m)
- SV1 — SOIL VAPOUR PIN LOCATION AND NUMBER

SAMPLE ID	DEPTH (metres)
CHEMICAL	CONCENTRATION

SOIL/SURFACE SAMPLE EXCEEDANCE

SAMPLE ID	-
CHEMICAL	CONCENTRATION (µg/L)

GROUNDWATER SAMPLE EXCEEDANCE

- SOIL/SURFACE CONTAMINATION ABOVE SAC FOR HUMAN HEALTH RISK
- SOIL CONTAMINATION ABOVE SAC FOR ECOLOGICAL RISK
- GROUNDWATER CONTAMINATION ABOVE SAC

AERIAL IMAGE SOURCE: MAPS.AU.NEARMAP.COM

0 3 6 9 12 15

SCALE 1:300 @A3 METRES

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

Title: **SAC EXCEEDANCE PLAN**

Location: 45-53 MACLEAY STREET, POTTS POINT, NSW

Project No: E34303B

Figure No: 3

JKEnvironments

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Appendix B: Site Information

Selected BYDA Plans

SY142 - FH1

0.7-0.9
0.5

Ref: C8

SY142 - FI1

1x100 AC

NA
0.3

Ref: C8

SY142 - FJ1

1.0-1.8
0.3

Ref: D9

SY142 - GO1

3x140 FC

NA
0.5-0.6

Ref: E9

SY142 - HQ1

1x100 FC

NA
0.4

Ref: D5

SY142 - HR1

6x100 FC

NA
0.6-0.7

Ref: E8

SY142 - HS1

Ref: F8

SY142 - HT1

1x140 AC

1.5
0.4

Ref: G8

SY142 - UB1

4x150 FC

NA
0.7

Ref: D8

SY142 - UH1

1x50 PVC

0.0
0.4

Ref: B5

SY142 - UI1

Ref: D8

SY142 - UJ1

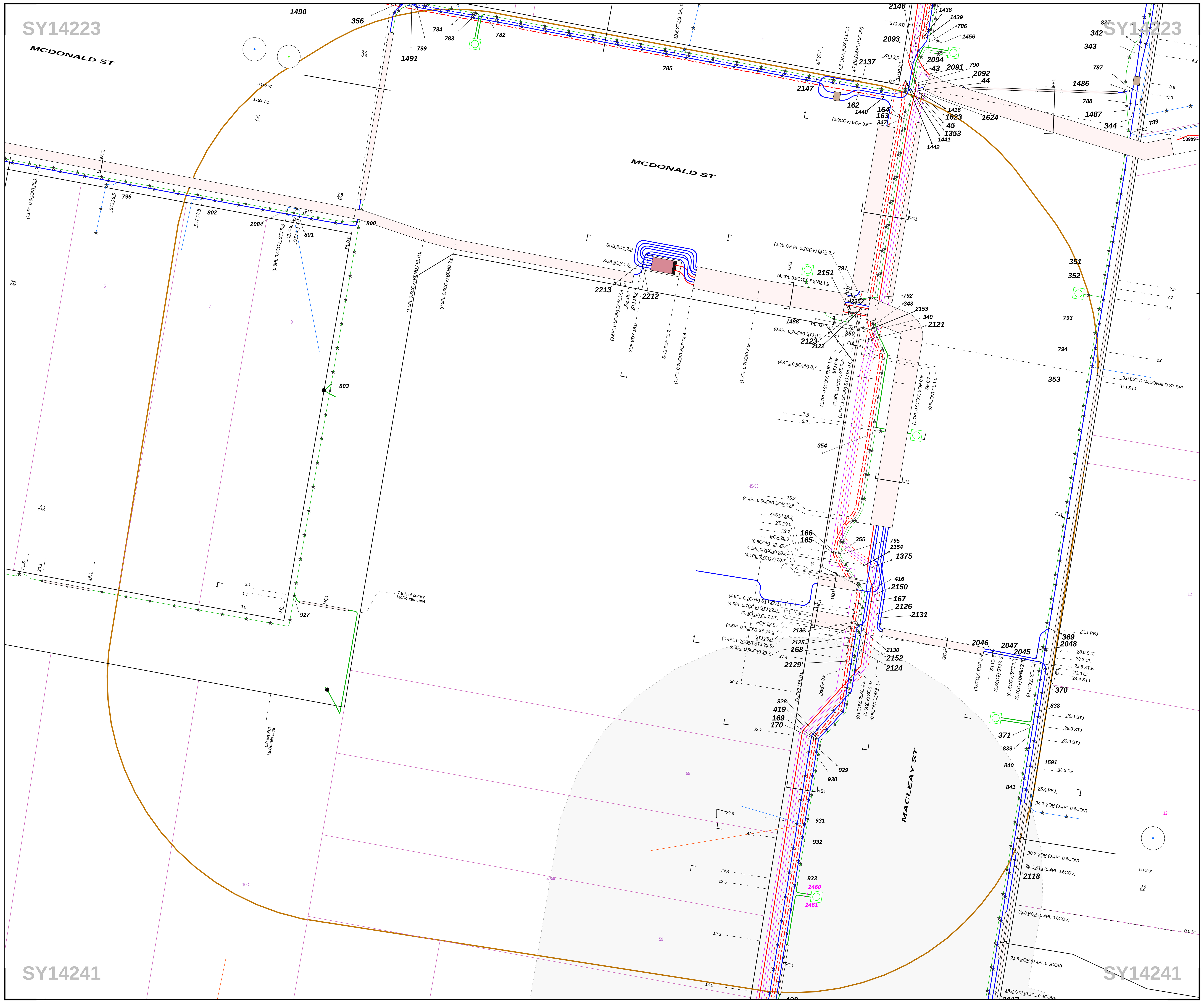
Ref: C8

SY142 - UK1

Ref: C8

SY142 - FG1

Ref: B8



JOINT DETAIL REPORT

No.	Bk-Pg	Pl/Cvr	Joint Location
Map: SY142			
162		1.10/0.50	3.1 W OF MACLEAY ST WBL
163		0.10/0.60	2.7 S OF MCDONALD ST NBL
164		0.10/0.60	2.6 S OF MCDONALD ST NBL
165	395-90	1.10/0.60	18.3 S OF MCDONALD ST SBL
166	395-90	1.07/0.61	18.3 S OF MCDONALD ST SBL
167	535-44	4.27/0.76	22.3 S OF MCDONALD ST SBL
168	535-44	4.27/0.76	25.8 S OF MCDONALD ST SBL
169	395-90	0.99/0.46	33.7 S OF MCDONALD ST SBL
170	395-90	0.69/0.46	33.7 S OF MCDONALD ST SBL
347		0.90/0.40	2.9 S OF MCDONALD ST NBL
348	488-63	1.14/0.38	1.6 N OF MCDONALD ST SBL
349	488-43	0.50/0.30	1.2 E OF MACLEAY ST WBL
350	488-43	0.80/0.40	0.5 W OF MCLEAY ST WBL
353	205-129	1.07/0.46	0.4 S OF MCDONALD ST SBL EXT
354	380-30	1.20/0.50	8.2 S OF MCDONALD ST SBL
355	395-90	1.30/0.61	18.3 S OF MCDONALD ST SBL
369	1961-33		21.1 S OF MCDONALD ST SBL EXT
370	171-56	1.22/	24.4 S OF MCDONALD ST SBL EXT
371	185-149	1.22/0.38	29.0 S OF MCDONALD ST SBL EXT
416	422-82	4.57/0.76	21.3 S OF MCDONALD ST SBL
419	395-90	1.45/0.46	33.7 S OF MCDONALD ST SBL
782	939-81	0.61/0.36	1.8 E OF MCDONALD LANE EBL EXT
783	939-81	0.61/0.36	1.2 E OF MCDONALD LANE EBL EXT
784	889-73		LEVEL WITH MCDONALD EBL EXT
785	899-78	1.07/0.43	18.5 W OF MACLEAY ST WBL
791	488-43	0.10/0.40	2.5 N OF MCDONALD ST SBL
792		1.80/	2.3 N OF MCDONALD ST SBL
794	1593-79	0.90/0.50	2.0 N OF MCDONALD ST SBL EXT
795	935-50	1.60/0.51	18.3 S OF MCDONALD ST SBL
800	843-72	2.06/0.46	0.2 E OF MCDONALD LANE WBL EXT
801	889-77	0.91/0.38	4.4 W OF MCDONALD LANE WBL
802	1455-18	0.80/0.40	12.5 W OF MCDONALD LANE WBL
803	949-10	0.30/0.50	12.5 S OF MCDONALD ST SBL
838	2081-62	1.60/0.30	28.0 S OF MCDONALD ST SBL EXT
839	2081-62	1.60/0.30	30.0 S OF MCDONALD ST SBL EXT
840			32.5 S OF MCDONALD ST SBL EXT
841	2131-3	1.20/0.40	35.4 N OF CHALLIS AVE NBL EXT

No.	Bk-Pg	Pl/Cvr	Joint Location
927	949-10	0.20/0.30	2.1 N OF MCDONALD LANE NBL
928	395-90	1.68/0.46	33.7 S OF MCDONALD ST SBL
929	949-71	1.75/0.23	APPROX 35 S OF MCDONALD ST SBL
930	949-71	1.83/0.23	APPROX 35.4 S OF MCDONALD ST SBL
931	1591-54	1.25/0.40	29.8 N of Challis Ave NPL
932		2.06/0.38	42.1 S OF MCDONALD ST SBL
933	1710-11	1.47/0.40	24.4 N OF CHALLIS AVE NBL
1375	430-77	4.60/0.80	19.2 S OF MCDONALD ST SBL
1440			1.0 W OF MACLEAY ST WBL
1488	1002-35	0.80/0.40	3.6 W OF MACLEAY ST WBL
1591	2145-21	0.05/0.40	32.5 S OF MCDONALD ST SBL EXT
2045	IC11-0873	3.40/0.75	23.8 S OF McDONALD ST EXT'D SPL
2046	IC11-0873	5.10/0.75	23.8 S OF McDONALD ST EXT'D SPL
2047	IC11-0901	4.60/0.50	23.8 S OF McDONALD ST EXT'D SPL
2048	IC11-0901	1.50/0.40	23.0 S OF McDONALD ST EXT'D SPL
2084	ES12-1475	/0.40	5.5 W OF MCDONALD LN W PL
2121	IC14-0392	0.40/0.70	0.7 S OF MCDONALD ST S PL
2122	IC14-0392	1.60/1.00	0.2 W OF MACLEAY ST W PL
2123	IC14-0392	1.70/1.00	MACLEAY ST EXT'D W PL
2124	IC14-0397	4.40/0.70	25.6 S OF MCDONALD ST S PL
2125	IC14-0397	4.50/0.70	24.0 S OF MCDONALD ST S PL
2126	IC14-0400	4.90/0.70	22.6 S OF MCDONALD ST S PL
2129	IC14-0456	4.40/0.60	26.7 S OF MCDONALD ST S PL
2130	IC14-0456	4.30/0.60	
2131	IC14-0514	4.90/0.70	22.9 S OF MCDONALD ST S PL
2132	IC14-0514	4.40/0.60	23.5 S OF MCDONALD ST S PL
2137	IC14-0457	0.60/0.50	3.7 W OF MACLEAY ST W PL
2147	IC14-0610	1.00/0.50	6.7 W OF MACLEAY ST W PL
2150	IC14-0635	5.10/0.60	21.1 S OF MCDONALD ST S PL
2151	IC14-0639	1.50/0.80	0.9 W OF MCLEAY ST W PL
2152	IC14-0643	4.60/0.80	25.0 S OF MCDONALD ST S PL
2153	IC14-0639	0.70/0.60	1.1 N OF MCDONALD ST S PL
2154	IC14-0639	4.10/0.80	19.0 S OF MCDONALD ST S PL
2212	IC16-0425	2.00/0.70	18.3 W OF MACLEAY ST W PL
2213	IC16-0425	1.80/0.80	18.4 W OF MACLEAY ST W PL
2352	IC15-1136		NO RECORD
2460			
2461			

WARNING

Ausgrid's plans show the position of assets at the time of installation and may not account for subsequent changes to road alignments, fences or buildings. The plans show no more than the presence or absence of Ausgrid assets in the street.
Persons working near electricity networks must exercise care and will be held responsible for any damage caused.
You must excavate by hand or use vacuum excavation to establish the location of Ausgrid underground cables and associated assets.
Underground: Working near a cable may result in electric shock even if no contact is made. Any work in the vicinity of any cable should only be performed using safe work methods developed in accordance with the recommendations included in Safework NSW Code of Practice for Excavation and Safework NSW Guide for Work Near Underground Assets
as well as recommendations of Ausgrid's Network Standard NS156.
Overhead: Do not excavate near poles or towers until the stability of the foundation has been assessed by Ausgrid. Cables or earth conductors may be present close to substations, poles or towers.
Workers must maintain safe approach distances and follow applicable Safework NSW Codes of Practice.
NOTE: 1. You must keep Ausgrid plans on site during excavation works. If the people actually performing the excavation works do not know how to read and interpret Ausgrid's plans, then the work must be directed by a person who knows how to read and interpret the plans. 2. This information includes data from the NSW Digital Cadastral Database by Land and Property Information (c) 2016, used under Creative Commons licence version 4.0.

N

SY14212	SY14221	SY14222
SY14214	SY14223	SY14224
SY14232	SY14241	SY14242

ISG GRID

GMLA0

Distribution - 227548204

INFORMATION ON THIS PLAN ONLY VALID FOR 30 DAYS FROM ISSUE DATE

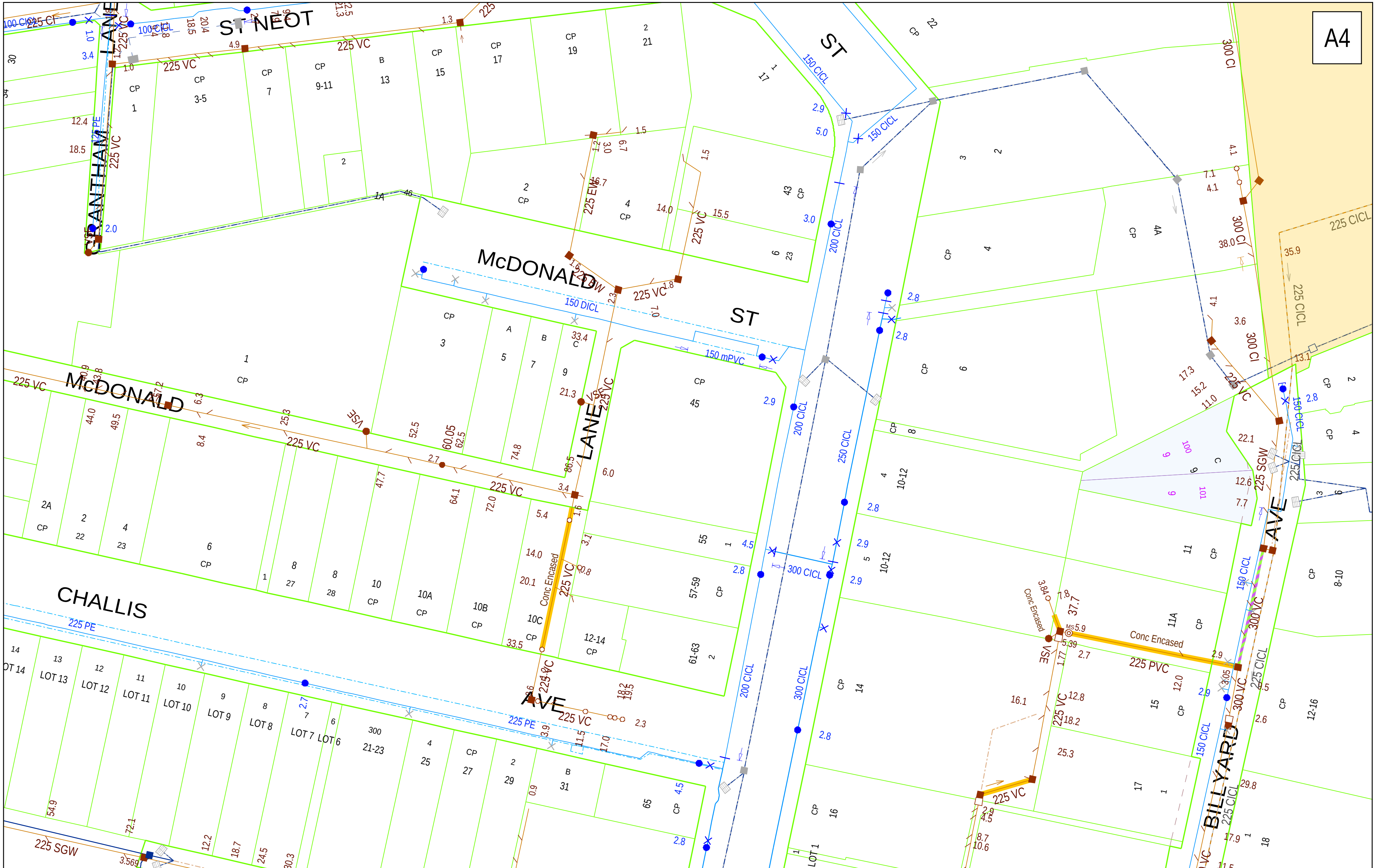
26 Jul 2023

Page 1 of 1

1:130

0 — 8 metres

Ausgrid



DBYD Address:
n/a The Chimes
45-53 Macleay St
Potts Point NSW
2011

DBYD Job No: 34698543

DBYD Sequence No: 227548207

SYDNEY WATER CORPORATION

Scale: 1:1000

Date of Production: 26/07/2023

Plan 1 of 1

N

0m 5m 10m 15m 20m

Rainfall Information

Monthly Rainfall (millimetres)

SYDNEY (OBSERVATORY HILL)

Station Number: 066214 · State: NSW · Opened: 2017 · Status: Open · Latitude: 33.86°S · Longitude: 151.20°E · Elevation: 43 m

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2017											*67.8*	*49.2*	
2018	*41.2*	*118.0*	*110.2*	*24.2*	*23.2*	*173.4*	*11.2*	*8.6*	*49.8*	*171.4*	*171.6*	*97.6*	*1000.4*
2019	*55.8*	*95.0*	*240.8*	*12.4*	*15.6*	*182.4*	*49.2*	*71.2*		*35.4*	*29.8*	*1.8*	
2020	*79.4*	*434.4*	*181.4*	*29.6*	*138.2*	*80.2*	*209.2*	*79.4*		*108.4*	*69.0*	*119.0*	
2021	*97.8*	*120.6*	*417.4*	*15.4*	*66.6*	*80.4*	38.4	*81.4*	*47.8*	*54.6*	*137.0*	132.8	*1290.2*
2022	*166.2*	356.0	*554.0*	*267.2*	*187.2*	16.8	*404.0*	*59.2*	*90.2*	*295.4*	55.6	*78.2*	*2530.0*
2023	191.4		*54.0*	*178.8*	61.6	*17.8*	*21.0*						

Quality control: 12.3 Done & acceptable, *12.3* Not completed or unknown

Monthly Rainfall (millimetres)

SYDNEY (OBSERVATORY HILL)

Station Number: 066214 · State: NSW · Opened: 2017 · Status: Open · Latitude: 33.86°S · Longitude: 151.20°E · Elevation: 43 m

Statistics for this station calculated over all years of data

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Lowest	41.2	95.0	54.0	12.4	15.6	16.8	11.2	8.6	47.8	35.4	29.8	1.8	1000.4
Highest	191.4	434.4	554.0	267.2	187.2	182.4	404.0	81.4	90.2	295.4	171.6	132.8	2530.0

1) Calculation of statistics

Summary statistics, other than the Highest and Lowest values, are only calculated if there are at least 20 years of data available.

2) Gaps and missing data

Gaps may be caused by a damaged instrument, a temporary change to the site operation, or due to the absence or illness of an observer.

3) Further information

http://www.bom.gov.au/climate/cdo/about/about-rain-data.shtml.

Product code: IDCJAC0001 reference: 98899970 Created on Tue 29 Aug 2023 11:54:04 AM AEST

SafeWork NSW Records

Vittal Boggaram

From:	Licensing <licensing@safework.nsw.gov.au>
Sent:	Thursday, 17 August 2023 2:51 PM
To:	Vittal Boggaram
Subject:	SafeWork NSW: 00871082 –Site Search application – Result not found [ref:_00D281hl6J._500Mn6VlFM:ref]

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

Security Classification: Sensitive Personal
Please do not amend the subject line of this email

Dear Vittal

Re: Site Search for Schedule 11 Hazardous Chemicals on premises Application – Result not found

I refer to your application for a Site Search for Schedule 11 Hazardous Chemicals on premises, received by SafeWork NSW on 1/8/2023 for the following site: 45-53 Macleay Street Potts Point NSW 2011.

A search of the records held by SafeWork NSW has not located any records pertaining to the above-mentioned premises.

If you have any further information or if you have any questions, please use one of the following options, quoting the SafeWork NSW enquiry reference number: 00871082

- Email: licensing@safework.nsw.gov.au
- Phone: 13 10 50

Kind regards

Laura Lee
Licensing Representative
SafeWork NSW | Better Regulation Division
Department of Customer Service
p- 13 10 50
e- licensing@safework.nsw.gov.au | www.customerservice.nsw.gov.au
Level 3, 32 Mann Street, Gosford, NSW 2250

NSW GOVERNMENT | Customer Service

We are always looking for ways that we can improve our services. You may be contacted by email in the next few weeks to complete a short survey and provide us with your feedback on what we did well and where we can improve. If you do not wish to participate in our surveys, please email us at: licensingQA@customerservice.nsw.gov.au and we will ensure that you are not contacted.

Appendix C: Laboratory Results Summary Tables

ABBREVIATIONS AND EXPLANATIONS

Abbreviations used in the Tables:

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

Table Specific Explanations:

HIL Tables:

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

EIL/ESL Table:

- ABC Values for selected metals have been adopted from the published background concentrations presented in Olszowy et. al., (1995), Trace Element Concentrations in Soils from Rural and Urban New South Wales (the 25th percentile values for old suburbs with high traffic have been quoted).

Waste Classification and TCLP Table:

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

QA/QC Table:

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

JKEnvironments

TABLE S1
SOIL LABORATORY RESULTS COMPARED TO NEPM 2013.
HIL-B: 'Residential with minimal opportunities for soil access; including dwellings with fully/permanently paved yards like high-rise buildings'

All data in mg/kg unless stated otherwise			HEAVY METALS								PAHs		ORGANOCHLORINE PESTICIDES (OCPs)							OP PESTICIDES (OPPs)		
			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	Carcinogenic PAHs	HCB	Endosulfan	Methoxychlor	Aldrin & Dieldrin	Chlordane	DDT, DDD & DDE	Heptachlor	Chlorpyrifos	TOTAL PCBs	ASBESTOS FIBRES
PQL - Envirolab Services			4	0.4	1	1	1	0.1	1	1	-	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	100
Site Assessment Criteria (SAC)			500	150	500	30000	1200	120	1200	60000	400	4	15	400	500	10	90	600	10	340	1	Detected/Not Detected
Sample Reference	**Sample Depth**	**Sample Description**																				
BH1	0.2-0.3	Fill - Silty Sand	<4	<0.4	<1	<1	**1**	<0.1	<1	**5**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH1	0.2-0.3	Lab Duplicate	<4	<0.4	<1	<1	<1	<0.1	<1	**4**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH1	0.7-1.0	Sandstone	<4	<0.4	**1**	<1	**2**	<0.1	<1	<1	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH2	0.15-0.3	Fill - Gravel	<4	<0.4	**4**	**2**	**1**	<0.1	<1	<1	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH3	0.2-0.4	Sandstone	<4	<0.4	**4**	**6**	**6**	<0.1	**1**	**10**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
TP5	0.1-0.2	Fill - Silty Sand	<4	<0.4	**13**	**70**	**250**	<0.1	**27**	**140**	**0.53**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
TP5	0.4-0.5	Fill - Clayey Sand	<4	<0.4	**2**	**2**	**22**	<0.1	<1	**5**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH6	0.1-0.3	Fill - Silty Sand	<4	<0.4	<1	**1**	**7**	<0.1	<1	**24**	**4.6**	**0.6**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH7	0-0.1	Fill - Silty Sand	<4	<0.4	**13**	**110**	**90**	**0.2**	**8**	**160**	**8.3**	**1**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH7	0.3-0.4	Fill - Silty Sand	<4	<0.4	**8**	**47**	**130**	**0.1**	**4**	**220**	**190**	**26**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH8	0.1-0.2	Fill - Silty Sand	<4	<0.4	**4**	**22**	**29**	**0.1**	**15**	**32**	**2.2**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**0.4**	Not Detected
BH9	0.12-0.2	Fill - Silty Sand	<4	<0.4	**3**	**5**	**25**	<0.1	**3**	**23**	**0.4**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH9	0.2-0.35	Fill - Silty Sand	<4	<0.4	**2**	**2**	**14**	<0.1	**2**	**5**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP10	0-0.1	Fill - Silty Sand	<4	**0.9**	**24**	**99**	**280**	**0.2**	**15**	**410**	**1.8**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**0.6**	Not Detected
TP10	0-0.1	Lab Duplicate	<4	**0.9**	**24**	**100**	**250**	**0.2**	**16**	**390**	**2**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**0.7**	NA
SDUP1 (intra-lab)	0.7-1.0	Field Duplicate of BH1	<4	<0.4	**2**	<1	**2**	<0.1	<1	**1**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SDUP3 (intra-lab)	0-0.1	Field Duplicate of BH7	<4	<0.4	**14**	**99**	**93**	**0.2**	**10**	**150**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
SDUP4 (Inter-lab)	0.2-0.4	Field Duplicate of BH3	<4	<0.4	**3**	**7**	**2**	<0.1	<1	**3**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SDUP5 (Inter-lab)	0-0.1	Field Duplicate of TP10	<4	**1**	**26**	**91**	**370**	**0.3**	**15**	**390**	**1.7**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**0.9**	NA
Total Number of Samples			19	19	19	19	19	19	19	19	19	19	13	13	13	13	13	13	13	13	13	9
Maximum Value			<PQL	1	26	110	370	0.3	27	410	190	26	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.9	Not Detected

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

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

					C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	Field PID Measurement
PQL - Envirolab Services					25	50	0.2	0.5	1	1	1	ppm
NEPM 2013 HSL Land Use Category					HSL-A/B: LOW/HIGH DENSITY RESIDENTIAL							
Sample Reference	**Sample Depth**	**Sample Description**	**Depth Category**	**Soil Category**								
BH1	0.2-0.3	Fill - Silty Sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	1.3
BH1	0.2-0.3	Lab Duplicate	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	1.3
BH1	0.7-1.0	Sandstone	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.6
BH2	0.15-0.3	Fill - Gravel	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.8
BH3	0.2-0.4	Sandstone	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	1
TP5	0.1-0.2	Fill - Silty Sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	1.1
TP5	0.4-0.5	Fill - Clayey Sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	1.7
BH6	0.1-0.3	Fill - Silty Sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	3.1
BH7	0-0.1	Fill - Silty Sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	1.7
BH7	0.3-0.4	Fill - Silty Sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	1.8
BH7 (Silica Gel)	0.3-0.4	Fill - Silty Sand	0m to <1m	Sand	NA	<50	NA	NA	NA	NA	NA	1.8
BH8	0.1-0.2	Fill - Silty Sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	3.1
BH9	0.12-0.2	Fill - Silty Sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	3
BH9	0.2-0.35	Fill - Silty Sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	2.9
TP10	0-0.1	Fill - Silty Sand	0m to <1m	Sand	<25	**97**	<0.2	<0.5	<1	<1	<1	0.4
TP10	0-0.1	Lab Duplicate	0m to <1m	Sand	<25	**110**	<0.2	<0.5	<1	<1	<1	0.4
TP10 (Silica Gel)	0-0.1	Fill - Silty Sand	0m to <1m	Sand	NA	<50	NA	NA	NA	NA	NA	0.4
SDUP1 (intra-lab)	0.7-1.0	Field Duplicate of BH1	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	NA
SDUP3 (intra-lab)	0-0.1	Field Duplicate of BH7	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	NA
SDUP4 (Inter-lab)	0.2-0.4	Field Duplicate of BH3	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	NA
SDUP5 (Inter-lab)	0-0.1	Field Duplicate of TP10	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	NA
Total Number of Samples					19	21	19	19	19	19	19	17
Maximum Value					<PQL	110	<PQL	<PQL	<PQL	<PQL	<PQL	3.1

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

HSL SOIL ASSESSMENT CRITERIA

Sample Reference	Sample Depth	Sample Description	Depth Category	Soil Category	C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene
BH1	0.2-0.3	Fill - Silty Sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH1	0.2-0.3	Lab Duplicate	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH1	0.7-1.0	Sandstone	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH2	0.15-0.3	Fill - Gravel	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH3	0.2-0.4	Sandstone	0m to <1m	Sand	45	110	0.5	160	55	40	3
TP5	0.1-0.2	Fill - Silty Sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
TP5	0.4-0.5	Fill - Clayey Sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH6	0.1-0.3	Fill - Silty Sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH7	0-0.1	Fill - Silty Sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH7	0.3-0.4	Fill - Silty Sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH7 (Silica Gel)	0.3-0.4	Fill - Silty Sand	0m to <1m	Sand	NA	110	NA	NA	NA	NA	NA
BH8	0.1-0.2	Fill - Silty Sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH9	0.12-0.2	Fill - Silty Sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH9	0.2-0.35	Fill - Silty Sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
TP10	0-0.1	Fill - Silty Sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
TP10	0-0.1	Lab Duplicate	0m to <1m	Sand	45	110	0.5	160	55	40	3
TP10 (Silica Gel)	0-0.1	Fill - Silty Sand	0m to <1m	Sand	NA	110	NA	NA	NA	NA	NA
SDUP1 (intra-lab)	0.7-1.0	Field Duplicate of BH1	0m to <1m	Sand	45	110	0.5	160	55	40	3
SDUP3 (intra-lab)	0-0.1	Field Duplicate of BH7	0m to <1m	Sand	45	110	0.5	160	55	40	3
SDUP4 (Inter-lab)	0.2-0.4	Field Duplicate of BH3	0m to <1m	Sand	45	110	0.5	160	55	40	3
SDUP5 (Inter-lab)	0-0.1	Field Duplicate of TP10	0m to <1m	Sand	45	110	0.5	160	55	40	3

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

			C_6-C_{10} (F1) plus BTEX	>C_{10}-C_{16} (F2) plus napthalene	>C_{16}-C_{34} (F3)	>C_{34}-C_{40} (F4)
PQL - Envirolab Services			25	50	100	100
NEPM 2013 Land Use Category			**COMMERCIAL/INDUSTRIAL**			
Sample Reference	**Sample Depth**	**Soil Texture**				
BH1	0.2-0.3	Coarse	<25	<50	<100	<100
BH1	0.2-0.3	Coarse	<25	<50	<100	<100
BH1	0.7-1.0	Coarse	<25	<50	<100	<100
BH2	0.15-0.3	Coarse	<25	<50	<100	<100
BH3	0.2-0.4	Coarse	<25	<50	<100	<100
TP5	0.1-0.2	Coarse	<25	<50	<100	<100
TP5	0.4-0.5	Coarse	<25	<50	<100	<100
BH6	0.1-0.3	Coarse	<25	<50	<100	<100
BH7	0-0.1	Coarse	<25	<50	**260**	**110**
BH7	0.3-0.4	Coarse	<25	<50	**590**	**160**
BH7 (Silica Gel)	0.3-0.4	Coarse	NA	<50	<100	<100
BH8	0.1-0.2	Coarse	<25	<50	<100	<100
BH9	0.12-0.2	Coarse	<25	<50	<100	<100
BH9	0.2-0.35	Coarse	<25	<50	<100	<100
TP10	0-0.1	Coarse	<25	**97**	**2800**	**1300**
TP10	0-0.1	Coarse	<25	**110**	**2500**	**1200**
TP10 (Silica Gel)	0-0.1	Coarse	NA	<50	**1000**	**430**
SDUP1 (intra-lab)	0.7-1.0	Coarse	<25	<50	<100	<100
SDUP3 (intra-lab)	0-0.1	Coarse	<25	<50	**290**	**130**
SDUP4 (Inter-lab)	0.2-0.4	Coarse	<25	<50	<100	<100
SDUP5 (Inter-lab)	0-0.1	Coarse	<25	<50	**1800**	**840**
Total Number of Samples			19	21	21	21
Maximum Value			<PQL	110	2800	1300

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

MANAGEMENT LIMIT ASSESSMENT CRITERIA

Sample Reference	**Sample Depth**	**Soil Texture**	C_6-C_{10} (F1) plus BTEX	>C_{10}-C_{16} (F2) plus napthalene	>C_{16}-C_{34} (F3)	>C_{34}-C_{40} (F4)
BH1	0.2-0.3	Coarse	700	1000	3500	10000
BH1	0.2-0.3	Coarse	700	1000	3500	10000
BH1	0.7-1.0	Coarse	700	1000	3500	10000
BH2	0.15-0.3	Coarse	700	1000	3500	10000
BH3	0.2-0.4	Coarse	700	1000	3500	10000
TP5	0.1-0.2	Coarse	700	1000	3500	10000
TP5	0.4-0.5	Coarse	700	1000	3500	10000
BH6	0.1-0.3	Coarse	700	1000	3500	10000
BH7	0-0.1	Coarse	700	1000	3500	10000
BH7	0.3-0.4	Coarse	700	1000	3500	10000
BH7 (Silica Gel)	0.3-0.4	Coarse	NA	1000	3500	10000
BH8	0.1-0.2	Coarse	700	1000	3500	10000
BH9	0.12-0.2	Coarse	700	1000	3500	10000
BH9	0.2-0.35	Coarse	700	1000	3500	10000
TP10	0-0.1	Coarse	700	1000	3500	10000
TP10	0-0.1	Coarse	700	1000	3500	10000
TP10 (Silica Gel)	0-0.1	Coarse	NA	1000	3500	10000
SDUP1 (intra-lab)	0.7-1.0	Coarse	700	1000	3500	10000
SDUP3 (intra-lab)	0-0.1	Coarse	700	1000	3500	10000
SDUP4 (Inter-lab)	0.2-0.4	Coarse	700	1000	3500	10000
SDUP5 (Inter-lab)	0-0.1	Coarse	700	1000	3500	10000

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

Analyte		C_6-C_{10}	>C_{10}-C_{16}	>C_{16}-C_{34}	>C_{34}-C_{40}	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	PID
PQL - Envirolab Services		25	50	100	100	0.2	0.5	1	1	1	
CRC 2011 -Direct contact Criteria		5,600	4,200	5,800	8,100	140	21,000	5,900	17,000	2,200	
Site Use		**HIGH DENSITY RESIDENTIAL - DIRECT SOIL CONTACT**									
Sample Reference	**Sample Depth**										
BH1	0.2-0.3	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**1.3**
BH1	0.2-0.3	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**1.3**
BH1	0.7-1.0	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.6**
BH2	0.15-0.3	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.8**
BH3	0.2-0.4	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**1**
TP5	0.1-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**1.1**
TP5	0.4-0.5	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**1.7**
BH6	0.1-0.3	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**3.1**
BH7	0-0.1	<25	<50	**260**	**110**	<0.2	<0.5	<1	<1	<1	**1.7**
BH7	0.3-0.4	<25	<50	**590**	**160**	<0.2	<0.5	<1	<1	<1	**1.8**
BH7 (Silica Gel)	0.3-0.4	NA	<50	<100	<100	NA	NA	NA	NA	NA	**1.8**
BH8	0.1-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**3.1**
BH9	0.12-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**3**
BH9	0.2-0.35	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**2.9**
TP10	0-0.1	<25	**97**	**2800**	**1300**	<0.2	<0.5	<1	<1	<1	**0.4**
TP10	0-0.1	<25	**110**	**2500**	**1200**	<0.2	<0.5	<1	<1	<1	**0.4**
TP10 (Silica Gel)	0-0.1	NA	<50	**1000**	**430**	NA	NA	NA	NA	NA	**0.4**
SDUP1 (intra-lab)	0.7-1.0	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	NA
SDUP3 (intra-lab)	0-0.1	<25	<50	**290**	**130**	<0.2	<0.5	<1	<1	<1	NA
SDUP4 (Inter-lab)	0.2-0.4	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	NA
SDUP5 (Inter-lab)	0-0.1	<25	<50	**1800**	**840**	<0.2	<0.5	<1	<1	<1	NA
Total Number of Samples		19	21	21	21	19	19	19	19	19	17
Maximum Value		<PQL	110	2800	1300	<PQL	<PQL	<PQL	<PQL	<PQL	3.1

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

TABLE S5
ASBESTOS QUANTIFICATION - FIELD OBSERVATIONS AND LABORATORY RESULTS
HSL-B: Residential with minimal opportunities for soil access

FIELD DATA															LABORATORY DATA											
Date Sampled	Sample reference	Sample Depth	Visible ACM in top 100mm	Approx. Volume of Soil (L)	Soil Mass (g)	Mass ACM (g)	Mass Asbestos in ACM (g)	[Asbestos from ACM in soil] (%w/w)	Mass ACM <7mm (g)	Mass Asbestos in ACM <7mm (g)	[Asbestos from ACM <7mm in soil] (%w/w)	Mass FA (g)	Mass Asbestos in FA (g)	[Asbestos from FA in soil] (%w/w)	Lab Report Number	Sample refeference	Sample Depth	Sample Mass (g)	Asbestos ID in soil (AS4964) >0.1g/kg	Trace Analysis	Total Asbestos (g/kg)	Asbestos ID in soil <0.1g/kg	ACM >7mm Estimation (g)	FA and AF Estimation (g)	ACM >7mm Estimation %(w/w)	FA and AF Estimation %(w/w)
SAC			**No**					**0.04**			**0.001**			**0.001**											**0.04**	**0.001**
31/07/2023	BH1	0.13-0.2	No	10	2,500	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	329662	BH1	0.2-0.3	418.28	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
1/08/2023	TP5	0.1-0.3	No	10	6,700	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	329662	BH2	0.15-0.3	871.11	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
1/08/2023	TP5	0.3-0.85	No	10	11,230	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1/08/2023	BH6	0.1-0.4	No	10	3,100	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	329662	TP5	0.1-0.2	658.96	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
1/08/2023	BH7	0-0.2	No	10	10,180	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	329662	BH6	0.1-0.3	837.7	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
1/08/2023	BH7	0.2-0.65	No	10	10,270	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	329662	BH7	0-0.1	435.93	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
2/08/2023	TP10	0-0.1	No	10	10,950	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	329662	BH8	0.1-0.2	756.95	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
2/08/2023	TP10	0.1-0.2	No	10	1,780	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	329662	BH9	0.12-0.2	826.43	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	329662	TP10	0-0.1	514.34	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001

Concentration above the SAC **VALUE**

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

Land Use Category				URBAN RESIDENTIAL AND PUBLIC OPEN SPACE																			
							AGED HEAVY METALS-EILs						EILs		ESLs								
				pH	CEC (cmolc/kg)	Clay Content (% clay)	Arsenic	Chromium	Copper	Lead	Nickel	Zinc	Naphthalene	DDT	C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	>C_{16}-C_{34} (F3)	>C_{34}-C_{40} (F4)	Benzene	Toluene	Ethylbenzene	Total Xylenes	B(a)P
PQL - Envirolab Services				-	1	-	4	1	1	1	1	1	1	0.1	25	50	100	100	0.2	0.5	1	1	0.05
Ambient Background Concentration (ABC)				-	-	-	NSL	13	28	163	5	122	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL
Sample Reference	**Sample Depth**	**Sample Description**	**Soil Texture**																				
BH1	0.2-0.3	Fill - Silty Sand	Coarse	7.07	18.67	NA	<4	<1	<1	1	<1	5	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH1	0.2-0.3	Lab Duplicate	Coarse	7.07	18.67	NA	<4	<1	<1	<1	<1	4	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH1	0.7-1.0	Sandstone	Coarse	7.07	18.67	NA	<4	1	<1	2	<1	<1	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH2	0.15-0.3	Fill - Gravel	Coarse	7.07	18.67	NA	<4	4	2	1	<1	<1	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH3	0.2-0.4	Sandstone	Coarse	7.07	18.67	NA	<4	4	6	6	1	10	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
TP5	0.1-0.2	Fill - Silty Sand	Coarse	7.07	18.67	NA	<4	13	70	250	27	140	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	0.08
TP5	0.4-0.5	Fill - Clayey Sand	Coarse	7.07	18.67	NA	<4	2	2	22	<1	5	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH6	0.1-0.3	Fill - Silty Sand	Coarse	7.07	18.67	NA	<4	<1	1	7	<1	24	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	0.3
BH7	0-0.1	Fill - Silty Sand	Coarse	7.07	18.67	NA	<4	13	110	90	8	160	<1	<0.1	<25	<50	260	110	<0.2	<0.5	<1	<1	0.7
BH7	0.3-0.4	Fill - Silty Sand	Coarse	7.07	18.67	NA	<4	8	47	130	4	220	<1	NA	<25	<50	590	160	<0.2	<0.5	<1	<1	20
BH7 (Silica Gel)	0.3-0.4	Fill - Silty Sand	Coarse	7.07	18.67	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<50	<100	<100	NA	NA	NA	NA	NA
BH8	0.1-0.2	Fill - Silty Sand	Coarse	7.07	18.67	NA	<4	4	22	29	15	32	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	0.2
BH9	0.12-0.2	Fill - Silty Sand	Coarse	7.07	18.67	NA	<4	3	5	25	3	23	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	0.09
BH9	0.2-0.35	Fill - Silty Sand	Coarse	7.07	18.67	NA	<4	2	2	14	2	5	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
TP10	0-0.1	Fill - Silty Sand	Coarse	7.07	18.67	NA	<4	24	99	280	15	410	<1	<0.1	<25	97	2800	1300	<0.2	<0.5	<1	<1	0.2
TP10	0-0.1	Lab Duplicate	Coarse	7.07	18.67	NA	<4	24	100	250	16	390	<1	<0.1	<25	110	2500	1200	<0.2	<0.5	<1	<1	0.2
TP10 (Silica Gel)	0-0.1	Fill - Silty Sand	Coarse	7.07	18.67	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<50	1000	430	NA	NA	NA	NA	NA
SDUP1 (intra-lab)	0.7-1.0	Field Duplicate of BH1	Coarse	7.07	18.67	NA	<4	2	<1	2	<1	1	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
SDUP3 (intra-lab)	0-0.1	Field Duplicate of BH7	Coarse	7.07	18.67	NA	<4	14	99	93	10	150	<1	<0.1	<25	<50	290	130	<0.2	<0.5	<1	<1	<0.05
SDUP4 (Inter-lab)	0.2-0.4	Field Duplicate of BH3	Coarse	7.07	18.67	NA	<4	3	7	2	<1	3	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
SDUP5 (Inter-lab)	0-0.1	Field Duplicate of TP10	Coarse	7.07	18.67	NA	<4	26	91	370	15	390	<1	<0.1	<25	<50	1800	840	<0.2	<0.5	<1	<1	0.14
Total Number of Samples				21	21	21	19	19	19	19	19	19	19	13	19	21	21	21	19	19	19	19	19
Maximum Value				7.07	18.67	<PQL	<PQL	26	110	370	27	410	<PQL	<PQL	<PQL	110	2800	1300	<PQL	<PQL	<PQL	<PQL	20

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

EIL AND ESL ASSESSMENT CRITERIA

Sample Reference	Sample Depth	Sample Description	Soil Texture	pH	CEC (cmolc/kg)	Clay Content (% clay)	Arsenic	Chromium	Copper	Lead	Nickel	Zinc	Naphthalene	DDT	C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	>C_{16}-C_{34} (F3)	>C_{34}-C_{40} (F4)	Benzene	Toluene	Ethylbenzene	Total Xylenes	B(a)P
BH1	0.2-0.3	Fill - Silty Sand	Coarse	7.07	18.67	NA	100	200	240	1300	280	820	170	180	180	120	300	2800	50	85	70	105	20
BH1	0.2-0.3	Lab Duplicate	Coarse	7.07	18.67	NA	100	200	240	1300	280	820	170	180	180	120	300	2800	50	85	70	105	20
BH1	0.7-1.0	Sandstone	Coarse	7.07	18.67	NA	100	200	240	1300	280	820	170	--	180	120	300	2800	50	85	70	105	20
BH2	0.15-0.3	Fill - Gravel	Coarse	7.07	18.67	NA	100	200	240	1300	280	820	170	180	180	120	300	2800	50	85	70	105	20
BH3	0.2-0.4	Sandstone	Coarse	7.07	18.67	NA	100	200	240	1300	280	820	170	180	180	120	300	2800	50	85	70	105	20
TP5	0.1-0.2	Fill - Silty Sand	Coarse	7.07	18.67	NA	100	200	240	1300	280	820	170	180	180	120	300	2800	50	85	70	105	20
TP5	0.4-0.5	Fill - Clayey Sand	Coarse	7.07	18.67	NA	100	200	240	1300	280	820	170	--	180	120	300	2800	50	85	70	105	20
BH6	0.1-0.3	Fill - Silty Sand	Coarse	7.07	18.67	NA	100	200	240	1300	280	820	170	180	180	120	300	2800	50	85	70	105	20
BH7	0-0.1	Fill - Silty Sand	Coarse	7.07	18.67	NA	100	200	240	1300	280	820	170	180	180	120	300	2800	50	85	70	105	20
BH7	0.3-0.4	Fill - Silty Sand	Coarse	7.07	18.67	NA	100	200	240	1300	280	820	170	--	180	120	300	2800	50	85	70	105	20
BH7 (Silica Gel)	0.3-0.4	Fill - Silty Sand	Coarse	7.07	18.67	NA	--	--	--	--	--	--	--	--	--	120	300	2800	--	--	--	--	--
BH8	0.1-0.2	Fill - Silty Sand	Coarse	7.07	18.67	NA	100	200	240	1300	280	820	170	180	180	120	300	2800	50	85	70	105	20
BH9	0.12-0.2	Fill - Silty Sand	Coarse	7.07	18.67	NA	100	200	240	1300	280	820	170	180	180	120	300	2800	50	85	70	105	20
BH9	0.2-0.35	Fill - Silty Sand	Coarse	7.07	18.67	NA	100	200	240	1300	280	820	170	--	180	120	300	2800	50	85	70	105	20
TP10	0-0.1	Fill - Silty Sand	Coarse	7.07	18.67	NA	100	200	240	1300	280	820	170	180	180	120	300	2800	50	85	70	105	20
TP10	0-0.1	Lab Duplicate	Coarse	7.07	18.67	NA	100	200	240	1300	280	820	170	180	180	120	300	2800	50	85	70	105	20
TP10 (Silica Gel)	0-0.1	Fill - Silty Sand	Coarse	7.07	18.67	NA	--	--	--	--	--	--	--	--	--	120	300	2800	--	--	--	--	--
SDUP1 (intra-lab)	0.7-1.0	Field Duplicate of BH1	Coarse	7.07	18.67	NA	100	200	240	1300	280	820	170	--	180	120	300	2800	50	85	70	105	20
SDUP3 (intra-lab)	0-0.1	Field Duplicate of BH7	Coarse	7.07	18.67	NA	100	200	240	1300	280	820	170	180	180	120	300	2800	50	85	70	105	20
SDUP4 (Inter-lab)	0.2-0.4	Field Duplicate of BH3	Coarse	7.07	18.67	NA	100	200	240	1300	280	820	170	--	180	120	300	2800	50	85	70	105	20
SDUP5 (Inter-lab)	0-0.1	Field Duplicate of TP10	Coarse	7.07	18.67	NA	100	200	240	1300	280	820	170	180	180	120	300	2800	50	85	70	105	20

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

			HEAVY METALS								PAHs		OC/OP PESTICIDES				Total	TRH					BTEX COMPOUNDS				ASBESTOS FIBRES
			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	B(a)P	Total Endosulfans	Chloropyrifos	Total Moderately Harmful	Total Scheduled	PCBs	C_6-C_9	C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C_{36}	Total C_{10}-C_{36}	Benzene	Toluene	Ethyl benzene	Total Xylenes	
PQL - Envirolab Services			4	0.4	1	1	1	0.1	1	1	-	0.05	0.1	0.1	0.1	0.1	0.1	25	50	100	100	50	0.2	0.5	1	1	100
General Solid Waste CT1			100	20	100	NSL	100	4	40	NSL	200	0.8	60	4	250	50	50	650		NSL		10,000	10	288	600	1,000	-
General Solid Waste SCC1			500	100	1900	NSL	1500	50	1050	NSL	200	10	108	7.5	250	50	50	650		NSL		10,000	18	518	1,080	1,800	-
Restricted Solid Waste CT2			400	80	400	NSL	400	16	160	NSL	800	3.2	240	16	1000	50	50	2600		NSL		40,000	40	1,152	2,400	4,000	-
Restricted Solid Waste SCC2			2000	400	7600	NSL	6000	200	4200	NSL	800	23	432	30	1000	50	50	2600		NSL		40,000	72	2,073	4,320	7,200	-
Sample Reference	**Sample Depth**	**Sample Description**																									
BH1	0.2-0.3	Fill - Silty Sand	<4	<0.4	<1	<1	**1**	<0.1	<1	**5**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH1	0.2-0.3	Lab Duplicate	<4	<0.4	<1	<1	<1	<0.1	<1	**4**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH1	0.7-1.0	Sandstone	<4	<0.4	**1**	<1	**2**	<0.1	<1	<1	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH2	0.15-0.3	Fill - Gravel	<4	<0.4	**4**	**2**	**1**	<0.1	<1	<1	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH3	0.2-0.4	Sandstone	<4	<0.4	**4**	**6**	**6**	<0.1	**1**	**10**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
TP5	0.1-0.2	Fill - Silty Sand	<4	<0.4	**13**	**70**	**250**	<0.1	**27**	**140**	**0.53**	**0.08**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
TP5	0.4-0.5	Fill - Clayey Sand	<4	<0.4	**2**	**2**	**22**	<0.1	<1	**5**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH6	0.1-0.3	Fill - Silty Sand	<4	<0.4	<1	**1**	**7**	<0.1	<1	**24**	**4.6**	**0.3**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH7	0-0.1	Fill - Silty Sand	<4	<0.4	**13**	**110**	**90**	**0.2**	**8**	**160**	**8.3**	**0.7**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	**140**	**170**	**310**	<0.2	<0.5	<1	<1	Not Detected
BH7	0.3-0.4	Fill - Silty Sand	<4	<0.4	**8**	**47**	**130**	**0.1**	**4**	**220**	**190**	**20**	NA	NA	NA	NA	NA	<25	<50	**440**	**240**	**680**	<0.2	<0.5	<1	<1	NA
BH7 (Silica Gel)	0.3-0.4	Fill - Silty Sand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<50	<100	<100	<50	NA	NA	NA	NA	NA
BH8	0.1-0.2	Fill - Silty Sand	<4	<0.4	**4**	**22**	**29**	**0.1**	**15**	**32**	**2.2**	**0.2**	<0.1	<0.1	<0.1	<0.1	**0.4**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH9	0.12-0.2	Fill - Silty Sand	<4	<0.4	**3**	**5**	**25**	<0.1	**3**	**23**	**0.4**	**0.09**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH9	0.2-0.35	Fill - Silty Sand	<4	<0.4	**2**	**2**	**14**	<0.1	**2**	**5**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
TP10	0-0.1	Fill - Silty Sand	<4	**0.9**	**24**	**99**	**280**	**0.2**	**15**	**410**	**1.8**	**0.2**	<0.1	<0.1	<0.1	<0.1	**0.6**	<25	**92**	**1200**	**2200**	**3492**	<0.2	<0.5	<1	<1	Not Detected
TP10	0-0.1	Lab Duplicate	<4	**0.9**	**24**	**100**	**250**	**0.2**	**16**	**390**	**2**	**0.2**	<0.1	<0.1	<0.1	<0.1	**0.7**	<25	**100**	**1100**	**1900**	**3100**	<0.2	<0.5	<1	<1	NA
TP10 (Silica Gel)	0-0.1	Fill - Silty Sand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<50	**480**	**700**	**1180**	NA	NA	NA	NA	NA
SDUP1 (intra-lab)	0.7-1.0	Field Duplicate of BH1	<4	<0.4	**2**	<1	**2**	<0.1	<1	**1**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
SDUP3 (intra-lab)	0-0.1	Field Duplicate of BH7	<4	<0.4	**14**	**99**	**93**	**0.2**	**10**	**150**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	**140**	**210**	**350**	<0.2	<0.5	<1	<1	NA
SDUP4 (Inter-lab)	0.2-0.4	Field Duplicate of BH3	<4	<0.4	**3**	**7**	**2**	<0.1	<1	**3**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
SDUP5 (Inter-lab)	0-0.1	Field Duplicate of TP10	<4	**1**	**26**	**91**	**370**	**0.3**	**15**	**390**	**1.7**	**0.14**	<0.1	<0.1	<0.1	<0.1	**0.9**	<25	<50	**820**	**1300**	**2120**	<0.2	<0.5	<1	<1	NA
Total Number of Samples			19	19	19	19	19	19	19	19	19	19	13	13	13	13	13	19	21	21	21	21	19	19	19	19	9
Maximum Value			<PQL	1	26	110	370	0.3	27	410	190	20	<PQL	<PQL	<PQL	<PQL	0.9	<PQL	100	1200	2200	3492	<PQL	<PQL	<PQL	<PQL	Not Detected

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

VALUE

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

			Arsenic	Cadmium	Chromium	Lead	Mercury	Nickel	B(a)P
PQL - Envirolab Services			0.05	0.01	0.01	0.03	0.0005	0.02	0.001
TCLP1 - General Solid Waste			5	1	5	5	0.2	2	0.04
TCLP2 - Restricted Solid Waste			20	4	20	20	0.8	8	0.16
TCLP3 - Hazardous Waste			>20	>4	>20	>20	>0.8	>8	>0.16
Sample Reference	**Sample Depth**	**Sample Description**							
TP5	0.1-0.2	Fill - Silty Sand	NA	NA	NA	<0.03	NA	NA	NA
TP5	0.1-0.2	Lab Duplicate	NA	NA	NA	<0.03	NA	NA	NA
BH7	0.3-0.4	Fill - Silty Sand	NA	NA	NA	**0.03**	NA	NA	<0.001
TP10	0-0.1	Fill - Silty Sand	NA	NA	NA	<0.03	NA	NA	NA
Total Number of samples			0	0	0	4	0	0	1
Maximum Value			NA	NA	NA	0.03	NA	NA	<PQL

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

Detailed Site Investigation
45-53 Macleay Street, Potts Point, NSW
E34303Brpt3-DSI

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TABLE QS1
SOIL QA/QC SUMMARY

			TRH C6 - C10	TRH >C10-C16	TRH >C16-C34	TRH >C34-C40	Benzene	Toluene	Ethylbenzene	m+p-xylene	o-Xylene	Naphthalene	Acenaphthylene	Acenaph-thene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b,j+k)fluoranthen	Benzo(a)pyrene	Indeno(1,2,3-c,d)pyrene	Dibenzo(a,h)anthra-cen	Benzo(g,h,i)perylene
	PQL Envirolab SYD		25	50	100	100	0.2	0.5	1	2	1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.05	0.1	0.1	0.1
	PQL Envirolab VIC		25	50	100	100	0.2	0.5	1.0	2.0	1.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1
Intra	BH1	0.7-1.0	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
laboratory	SDUP1 (intra	0.7-1.0	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Intra	BH7	0-0.1	<25	<50	260	110	<0.2	<0.5	<1	<2	<1	<0.1	0.1	<0.1	<0.1	0.8	0.2	1.7	1.5	0.8	0.6	1	0.7	0.3	<0.1	0.5
laboratory	SDUP3 (intra	0-0.1	<25	<50	290	130	<0.2	<0.5	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
duplicate	MEAN		nc	nc	275	120	nc	nc	nc	nc	nc	nc	0.075	nc	nc	0.425	0.125	0.875	0.775	0.425	0.325	0.55	0.3625	0.175	nc	0.275
	RPD %		nc	nc	11%	17%	nc	nc	nc	nc	nc	nc	67%	nc	nc	176%	120%	189%	187%	176%	169%	164%	186%	143%	nc	164%
Inter	BH3	0.2-0.4	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
laboratory	SDUP4 (Inter	0.2-0.4	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Inter	TP10	0-0.1	<25	97	2800	1300	<0.2	<0.5	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	0.3	0.3	0.2	0.2	0.3	0.2	<0.1	<0.1	0.2
laboratory	SDUP5 (Inter	0-0.1	<25	<50	1800	840	<0.2	<0.5	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	0.2	0.3	0.1	0.1	0.3	0.14	0.2	<0.1	0.2
duplicate	MEAN		nc	61	2300	1070	nc	nc	nc	nc	nc	nc	nc	nc	nc	0.1	nc	0.25	0.3	0.15	0.15	0.3	0.17	0.125	nc	0.2
	RPD %		nc	118%	43%	43%	nc	nc	nc	nc	nc	nc	nc	nc	nc	0%	nc	40%	0%	67%	67%	0%	35%	120%	nc	0%
Trip	TB-S1	31/07/2023	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
Blank	31/07/23																									
Trip	TB-S2	1/08/2023	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
Blank	1/08/23																									
Field	FR1-SPT	µg/L	<10	<50	<100	<100	<1	<1	<1	<2	<1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1
Rinsate	31/07/23																									
Field	FR2-HA	µg/L	17	<50	<100	<100	<1	<1	<1	<2	<1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1
Rinsate	1/08/23																									
Trip	TS-S1		-	-	-	-	101%	100%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spike	31/07/23																									
Trip	TS-S2		-	-	-	-	97%	96%	96%	97%	97%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spike	1/08/23																									

			HCB	alpha- BHC	gamma- BHC	beta- BHC	Heptachlor	delta- BHC	Aldrin	Heptachlor Epoxide	Gamma- Chlordane	alpha- chlordane	Endosulfan I	pp- DDE	Dieldrin	Endrin	pp- DDD	Endosulfan II	pp- DDT	Endrin Aldehyde	Endosulfan Sulphate	Methoxychlor
	PQL Envirolab SYD		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	PQL Envirolab VIC		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Intra	BH1	0.7-1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
laboratory	SDUP1 (intra	0.7-1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Intra	BH7	0-0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
laboratory	SDUP3 (intra	0-0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Inter	BH3	0.2-0.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
laboratory	SDUP4 (Inter	0.2-0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Inter	TP10	0-0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
laboratory	SDUP5 (Inter	0-0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Trip	TB-S1	31/07/2023	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Blank	31/07/23																					
Trip	TB-S2	1/08/2023	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Blank	1/08/23																					
Field	FR1-SPT	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Rinsate	31/07/23																					
Field	FR2-HA	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Rinsate	1/08/23																					
Trip	TS-S1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spike	31/07/23																					
Trip	TS-S2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spike	1/08/23																					

			Azinphos-methyl (Guth	Bromophos-ethyl	Chlorpyriphos	Chlorpyriphos-methyl	Diazinon	Dichlorvos	Dimethoate	Ethion	Fenitrothion	Malathion	Parathion	Ronnel	Total PCBS	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
	PQL Envirolab SYD		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	4	0.4	1	1	1	0.1	1	1
	PQL Envirolab VIC		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	4.0	0.4	1.0	1.0	1.0	0.1	1.0	1.0
Intra	BH1	0.7-1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<4	<0.4	1	<1	2	<0.1	<1	<1
laboratory	SDUP1 (intra	0.7-1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<4	<0.4	2	<1	2	<0.1	<1	1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	1.5	nc	2	nc	nc	0.75
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	67%	nc	0%	nc	nc	67%
Intra	BH7	0-0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<4	<0.4	13	110	90	0.2	8	160
laboratory	SDUP3 (intra	0-0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<4	<0.4	14	99	93	0.2	10	150
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	13.5	104.5	91.5	0.2	9	155
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	7%	11%	3%	0%	22%	6%
Inter	BH3	0.2-0.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<4	<0.4	4	6	6	<0.1	1	10
laboratory	SDUP4 (Inter	0.2-0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<4	<0.4	3	7	2	<0.1	<1	3
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	3.5	6.5	4	nc	0.75	6.5
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	29%	15%	100%	nc	67%	108%
Inter	TP10	0-0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.6	<4	0.9	24	99	280	0.2	15	410
laboratory	SDUP5 (Inter	0-0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.9	<4	1	26	91	370	0.3	15	390
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	0.75	nc	0.95	25	95	325	0.25	15	400
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	40%	nc	11%	8%	8%	28%	40%	0%	5%
Trip	TB-S1	31/07/2023	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<4	<0.4	3	<1	4	<0.1	<1	2
Blank	31/07/23																						
Trip	TB-S2	1/08/2023	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<4	<0.4	4	<1	5	<0.1	<1	2
Blank	1/08/23																						
Field	FR1-SPT	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.01	<0.01	<0.01	<0.03	<0.0005	<0.02	<0.02
Rinsate	31/07/23																						
Field	FR2-HA	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.01	<0.01	0.08	<0.03	<0.0005	<0.02	<0.02
Rinsate	1/08/23																						
Trip	TS-S1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spike	31/07/23																						
Trip	TS-S2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spike	1/08/23																						

Result outside of QA/QC acceptance criteria Value

Rinsate metals results in mg/L

TABLE SV1
SOIL VAPOUR LABORATORY RESULTS COMPARED TO HSLs
All data in mg/m^3 unless stated otherwise

				C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene
PQL - Envirolab				0.2	0.04	0.0016	0.0019	0.0022	0.0065	0.0026
NEPM 2013 Land Use Category				**LOW/HIGH DENSITY RESIDENTIAL**						
Sample Reference	**Sample Depth**	**Depth Category**	**Soil Category**							
SV1	Sub-slab	0m to <1m	Sand	<0.2	<0.04	**0.002**	**0.010**	<0.0022	<0.0065	<0.0026
SV1 (Lab Dup)	Sub-slab	0m to <1m	Sand	<0.2	<0.04	**0.002**	**0.010**	<0.0022	<0.0065	<0.0026
SV2	Sub-slab	0m to <1m	Sand	<0.2	<0.04	<0.0016	**0.005**	<0.0022	<0.0065	<0.0026
SV3	Sub-slab	0m to <1m	Sand	<0.2	<0.04	<0.0016	**0.003**	<0.0022	<0.0065	<0.0026
SV4	Sub-slab	0m to <1m	Sand	<0.2	<0.04	<0.0016	<0.0019	<0.0022	<0.0065	<0.0026
SV5	Sub-slab	0m to <1m	Sand	<0.2	**0.14**	<0.0016	**0.005**	<0.0022	<0.0065	<0.0026
SVDUP1 (SV4)	Sub-slab	0m to <1m	Sand	<0.2	**0.04**	<0.0016	<0.0019	<0.0022	<0.0065	<0.0026
Total Number of Samples				7	7	7	7	7	7	7
Maximum Value				<PQL	0.14	0.002	0.01	<PQL	<PQL	<PQL

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

HSL SOIL VAPOUR ASSESSMENT CRITERIA

Sample Reference	**Sample Depth**	**Depth Category**	**Soil Category**	C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene
SV1	Sub-slab	0m to <1m	Sand	180	130	1	1300	330	220	0.8
SV1 (Lab Dup)	Sub-slab	0m to <1m	Sand	180	130	1	1300	330	220	0.8
SV2	Sub-slab	0m to <1m	Sand	180	130	1	1300	330	220	0.8
SV3	Sub-slab	0m to <1m	Sand	180	130	1	1300	330	220	0.8
SV4	Sub-slab	0m to <1m	Sand	180	130	1	1300	330	220	0.8
SV5	Sub-slab	0m to <1m	Sand	180	130	1	1300	330	220	0.8
SVDUP1	Sub-slab	0m to <1m	Sand	180	130	1	1300	330	220	0.8

TABLE SV2
SOIL VAPOUR LABORATORY RESULTS COMPARED TO INTERIM HILs FOR VOCC
All data in mg/m^3 unless stated otherwise

			TCE	1,1,1-TCA	PCE	cis 1,2 dichloro-ethene	Vinyl chloride
PQL - Envirolab			0.0027	0.0027	0.0034	0.002	0.0013
NEPM 2013 Site Assessment Criteria (SAC)			0.02	60	2	0.08	0.03
Land Use			**LOW/HIGH DENSITY RESIDENTIAL**				
Sample Reference	**Sample Depth**	**Sample Description**					
SV1	Sub-slab	Soil Vapour	<0.0027	<0.0027	<0.0034	<0.002	<0.0013
SV1 (Lab Dup)	Sub-slab	Lab Duplicate	<0.0027	<0.0027	<0.0034	<0.002	<0.0013
SV2	Sub-slab	Soil Vapour	<0.0027	<0.0027	<0.0034	<0.002	<0.0013
SV3	Sub-slab	Soil Vapour	<0.0027	<0.0027	<0.0034	<0.002	<0.0013
SV4	Sub-slab	Soil Vapour	**0.004**	<0.0027	<0.0034	<0.002	<0.0013
SV5	Sub-slab	Soil Vapour	<0.0027	<0.0027	<0.0034	<0.002	<0.0013
SVDUP1	Sub-slab	Field Duplicate at SV4	<0.0027	<0.0027	<0.0034	<0.002	<0.0013
Total Number of Samples			7	7	7	7	7
Maximum Value			0.004	<PQL	<PQL	<PQL	<PQL

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

TABLE SV3
SOIL VAPOUR LABORATORY RESULTS COMPARED TO USEPA SCREENING CRITERIA FOR VOCC
All data in µg/m3 unless stated otherwise

			Propylene	Ethanol	Acetone	Isopropyl Alcohol	Ethyl Acetate	Chloroform	1,2,4-Trimethylbenzene
PQL			0.9	9	11.9	12	1.8	2.4	2.5
USEPA#			104000	NSL	NSL	6950	2430	40.7	2090
Land Use			**LOW/HIGH DENSITY RESIDENTIAL**						
Sample Reference	**Sample Depth**	**Sample Description**							
SV1	Sub-slab	Soil vapour	**2**	**90**	**150**	<12	<1.8	**3**	**3**
SV1 (Lab Dup)	Sub-slab	Soil vapour	**2**	**91**	**150**	**10**	<1.8	**3**	**3**
SV2	Sub-slab	Soil vapour	**3**	**40**	**100**	<12	<1.8	**3**	<2.5
SV3	Sub-slab	Soil vapour	<0.9	**30**	<11.9	**20**	<1.8	**8**	<2.5
SV4	Sub-slab	Soil vapour	<0.9	**80**	**30**	<12	<1.8	<2.4	<2.5
SV5	Sub-slab	Soil vapour	<0.9	**150**	**60**	**510**	**20**	<2.4	**4**
SVDUP1	Sub-slab	Field Duplicate of SV4	<0.9	**150**	**40**	**10**	<1.8	<2.4	<2.5
Total Number of Samples			7	7	7	7	7	7	7
Maximum Value			3	150	150	510	20	8	4

Concentration above the SAC
Concentration above PQL
Target Sub-Slab and Near-sourceSoil Gas Concentration (TCR=1E-05or THQ=1) Csg,Target (µg/m3)

JKEnvironments

TABLE QSV4
SOIL VAPOR QA/QC SUMMARY

		TRH C6 - C10	TRH >C10-C16	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	TCE	1,1,1-TCA	PCE	cis 1,2 dichloro-ethene	Vinyl chloride	Propylene	Ethanol	Acetone	Isopropyl Alcohol
Intra	SV4	<0.2	<0.04	<0.0016	<0.0019	<0.0022	<0.0043	<0.0026	0.004	<0.0027	<0.0034	<0.002	<0.0013	<0.9	80	30	<12
laboratory	SVDUP1	<0.2	0.04	<0.0016	<0.0019	<0.0022	<0.0043	<0.0026	<0.0027	<0.0027	<0.0034	<0.002	<0.0013	<0.9	150	40	10
duplicate	MEAN	nc	0.03	nc	nc	nc	nc	nc	0.003	nc	nc	nc	nc	nc	115	35	8
	RPD %	nc	67%	nc	nc	nc	nc	nc	99%	nc	nc	nc	nc	nc	61%	29%	50%

Result outside of QA/QC acceptance criteria **VALUE**

RPDs calculated for detectable results of other VOCs only

Shroud Leak Test	Isopropanol (Shroud)		SV1	SV1 (Lab Dup)	SV2	SV3	SV4	SV5	SVDUP1
Isopropanol (ug/m3)	860,000		<12	10	<12	20	<12	510	10

Result outside of QA/QC acceptance criteria Value

ABBREVIATIONS AND EXPLANATIONS

Abbreviations used in the Tables:

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

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

	PQL Envirolab Services	ANZG 2018 Marine Waters	SAMPLES							
			MW1	MW1 (Lab Duplicate)	MW2	MW2 (Lab Duplicate)	MW3	SDUP1 (MW1)	SDUP2 (MW2)	SDUP2 (Lab Duplicate)
Inorganic Compounds and Parameters										
pH		7 - 8.5	6	NA	5.7	NA	7.6	NA	NA	NA
Electrical Conductivity (µS/cm)	1	NSL	**170**	NA	**170**	NA	**420**	NA	NA	NA
Turbidity (NTU)		NSL	NA	NA	NA	NA	NA	NA	NA	NA
Metals and Metalloids										
Arsenic (As III)	1	2.3	<1	<1	**1**	[NT]	**1**	**1**	**1**	NA
Cadmium	0.1	0.7	<0.1	<0.1	<0.1	[NT]	<0.1	<0.1	<0.1	NA
Chromium (SAC for Cr III adopted)	1	27	**2**	**2**	**2**	[NT]	<1	**2**	**2**	NA
Copper	1	1.3	**6**	**5**	**7**	[NT]	**6**	**6**	**7**	NA
Lead	1	4.4	<1	<1	**1**	[NT]	<1	<1	**1**	NA
Total Mercury (inorganic)	0.05	0.1	<0.05	[NT]	<0.05	<0.05	<0.05	<0.05	**3**	NA
Nickel	1	7	**1**	<1	**2**	[NT]	**2**	**1**	**25**	NA
Zinc	1	15	**17**	**16**	**23**	[NT]	**6**	**16**	<0.05	NA
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)										
Benzene	1	500	<1	NA	**3**	**3**	<1	<1	**3**	NA
Toluene	1	180	<1	NA	<1	<1	<1	<1	<1	NA
Ethylbenzene	1	5	<1	NA	<1	<1	<1	<1	<1	NA
m+p-xylene	2	75	<2	NA	<2	<2	<2	<2	<2	NA
o-xylene	1	350	<1	NA	<1	<1	<1	<1	<1	NA
Total xylenes	2	NSL	<2	NA	<2	<2	<2	<2	<2	NA
Volatile Organic Compounds (VOCs), including chlorinated VOCs										
Dichlorodifluoromethane	10	NSL	<10	NA	<10	<10	<10	<10	<10	NA
Chloromethane	10	NSL	<10	NA	<10	<10	<10	<10	<10	NA
Vinyl Chloride	10	100	<10	NA	<10	<10	<10	<10	<10	NA
Bromomethane	10	NSL	<10	NA	<10	<10	<10	<10	<10	NA
Chloroethane	10	NSL	<10	NA	<10	<10	<10	<10	<10	NA
Trichlorofluoromethane	10	NSL	<10	NA	<10	<10	<10	<10	<10	NA
1,1-Dichloroethene	1	700	<1	NA	<1	<1	<1	<1	<1	NA
Trans-1,2-dichloroethene	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
1,1-dichloroethane	1	250	<1	NA	<1	<1	<1	<1	<1	NA
Cis-1,2-dichloroethene	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
Bromochloromethane	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
Chloroform	1	370	<1	NA	2	2	<1	<1	2	NA
2,2-dichloropropane	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
1,2-dichloroethane	1	1900	<1	NA	<1	<1	<1	<1	<1	NA
1,1,1-trichloroethane	1	270	<1	NA	<1	<1	<1	<1	<1	NA
1,1-dichloropropene	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
Cyclohexane	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
Carbon tetrachloride	1	240	<1	NA	<1	<1	<1	<1	<1	NA
Benzene	1	500	<1	NA	**3**	**3**	<1	<1	**3**	NA
Dibromomethane	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
1,2-dichloropropane	1	900	<1	NA	<1	<1	<1	<1	<1	NA
Trichloroethene	1	330	<1	NA	<1	<1	<1	<1	<1	NA
Bromodichloromethane	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
trans-1,3-dichloropropene	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
cis-1,3-dichloropropene	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
1,1,2-trichloroethane	1	1900	<1	NA	<1	<1	<1	<1	<1	NA
Toluene	1	180	<1	NA	<1	<1	<1	<1	<1	NA
1,3-dichloropropane	1	1100	<1	NA	<1	<1	<1	<1	<1	NA
Dibromochloromethane	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
1,2-dibromoethane	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
Tetrachloroethene	1	70	<1	NA	<1	<1	<1	<1	<1	NA
1,1,1,2-tetrachloroethane	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
Chlorobenzene	1	55	<1	NA	<1	<1	<1	<1	<1	NA
Ethylbenzene	1	5	<1	NA	<1	<1	<1	<1	<1	NA
Bromoform	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
m+p-xylene	2	75	<2	NA	<2	<2	<2	<2	<2	NA
Styrene	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
1,1,2,2-tetrachloroethane	1	400	<1	NA	<1	<1	<1	<1	<1	NA
o-xylene	1	350	<1	NA	<1	<1	<1	<1	<1	NA
1,2,3-trichloropropane	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
Isopropylbenzene	1	30	<1	NA	<1	<1	<1	<1	<1	NA
Bromobenzene	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
n-propyl benzene	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
2-chlorotoluene	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
4-chlorotoluene	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
1,3,5-trimethyl benzene	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
Tert-butyl benzene	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
1,2,4-trimethyl benzene	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
1,3-dichlorobenzene	1	260	<1	NA	<1	<1	<1	<1	<1	NA
Sec-butyl benzene	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
1,4-dichlorobenzene	1	60	<1	NA	<1	<1	<1	<1	<1	NA
4-isopropyl toluene	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
1,2-dichlorobenzene	1	160	<1	NA	<1	<1	<1	<1	<1	NA
n-butyl benzene	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
1,2-dibromo-3-chloropropane	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
1,2,4-trichlorobenzene	1	20	<1	NA	<1	<1	<1	<1	<1	NA
Hexachlorobutadiene	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
1,2,3-trichlorobenzene	1	3	<1	NA	<1	<1	<1	<1	<1	NA
Polycyclic Aromatic Hydrocarbons (PAHs)										
Naphthalene	0.2	50	<0.2	<0.2	<0.2	NA	<0.2	<0.2	<0.1	NA
Acenaphthylene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	NA
Acenaphthene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	NA
Fluorene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	NA
Phenanthrene	0.1	0.6	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	NA
Anthracene	0.1	0.01	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	NA
Fluoranthene	0.1	1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	NA
Pyrene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	NA
Benzo(a)anthracene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	NA
Chrysene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	NA
Benzo(b,j+k)fluoranthene	0.2	NSL	<0.2	<0.2	<0.2	NA	<0.2	<0.2	<0.2	NA
Benzo(a)pyrene	0.1	0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	NA
Indeno(1,2,3-c,d)pyrene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	NA
Dibenzo(a,h)anthracene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	NA
Benzo(g,h,i)perylene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	NA

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

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

	PQL Envirolab Services	Recreational (10 x NHMRC ADWG)	SAMPLES							
			MW1	MW1 (Lab Duplicate)	MW2	MW2 (Lab Duplicate)	MW3	SDUP1 (MW1)	SDUP2 (MW2)	SDUP2 (Lab Duplicate)
Inorganic Compounds and Parameters										
pH		6.5 - 8.5	6	NA	5.7	NA	7.6	NA	NA	NA
Electrical Conductivity (µS/cm)	1	NSL	**170**	NA	**170**	NA	**420**	NA	NA	NA
Turbidity (NTU)		NSL	NA	NA	NA	NA	NA	NA	NA	NA
Metals and Metalloids										
Arsenic (As III)	1	100	<1	<1	**1**	[NT]	**1**	**1**	**1**	NA
Cadmium	0.1	20	<0.1	<0.1	<0.1	[NT]	<0.1	<0.1	<0.1	NA
Chromium (total)	1	500	**2**	**2**	**2**	[NT]	<1	**2**	**2**	NA
Copper	1	20000	**6**	**5**	**7**	[NT]	**6**	**6**	**7**	NA
Lead	1	100	<1	<1	**1**	[NT]	<1	<1	**1**	NA
Total Mercury (inorganic)	0.05	10	<0.05	[NT]	<0.05	<0.05	<0.05	<0.05	**3**	NA
Nickel	1	200	**1**	<1	**2**	[NT]	**2**	**1**	**25**	NA
Zinc	1	30000	**17**	**16**	**23**	[NT]	**6**	**16**	<0.05	NA
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)										
Benzene	1	10	<1	NA	**3**	**3**	<1	<1	**3**	NA
Toluene	1	8000	<1	NA	<1	<1	<1	<1	<1	NA
Ethylbenzene	1	3000	<1	NA	<1	<1	<1	<1	<1	NA
m+p-xylene	2	NSL	<2	NA	<2	<2	<2	<2	<2	NA
o-xylene	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
Total xylenes	2	6000	<2	NA	<2	<2	<2	<2	<2	NA
Volatile Organic Compounds (VOCs), including chlorinated VOCs										
Dichlorodifluoromethane	10	NSL	<10	NA	<10	<10	<10	<10	<10	NA
Chloromethane	10	NSL	<10	NA	<10	<10	<10	<10	<10	NA
Vinyl Chloride	10	3	<10	NA	<10	<10	<10	<10	<10	NA
Bromomethane	10	NSL	<10	NA	<10	<10	<10	<10	<10	NA
Chloroethane	10	NSL	<10	NA	<10	<10	<10	<10	<10	NA
Trichlorofluoromethane	10	NSL	<10	NA	<10	<10	<10	<10	<10	NA
1,1-Dichloroethene	1	300	<1	NA	<1	<1	<1	<1	<1	NA
Trans-1,2-dichloroethene	1	600	<1	NA	<1	<1	<1	<1	<1	NA
1,1-dichloroethane	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
Cis-1,2-dichloroethene	1	600	<1	NA	<1	<1	<1	<1	<1	NA
Bromochloromethane	1	2500	<1	NA	<1	<1	<1	<1	<1	NA
Chloroform	1		<1	NA	2	2	<1	<1	2	NA
2,2-dichloropropane	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
1,2-dichloroethane	1	30	<1	NA	<1	<1	<1	<1	<1	NA
1,1,1-trichloroethane	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
1,1-dichloropropene	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
Cyclohexane	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
Carbon tetrachloride	1	30	<1	NA	<1	<1	<1	<1	<1	NA
Benzene	1	10	<1	NA	**3**	**3**	<1	<1	**3**	NA
Dibromomethane	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
1,2-dichloropropane	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
Trichloroethene	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
Bromodichloromethane	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
trans-1,3-dichloropropene	1	1000	<1	NA	<1	<1	<1	<1	<1	NA
cis-1,3-dichloropropene	1	1000	<1	NA	<1	<1	<1	<1	<1	NA
1,1,2-trichloroethane	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
Toluene	1	8000	<1	NA	<1	<1	<1	<1	<1	NA
1,3-dichloropropane	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
Dibromochloromethane	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
1,2-dibromoethane	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
Tetrachloroethene	1	500	<1	NA	<1	<1	<1	<1	<1	NA
1,1,1,2-tetrachloroethane	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
Chlorobenzene	1	3000	<1	NA	<1	<1	<1	<1	<1	NA
Ethylbenzene	1	3000	<1	NA	<1	<1	<1	<1	<1	NA
Bromoform	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
m+p-xylene	2	NSL	<2	NA	<2	<2	<2	<2	<2	NA
Styrene	1	300	<1	NA	<1	<1	<1	<1	<1	NA
1,1,2,2-tetrachloroethane	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
o-xylene	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
1,2,3-trichloropropane	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
Isopropylbenzene	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
Bromobenzene	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
n-propyl benzene	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
2-chlorotoluene	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
4-chlorotoluene	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
1,3,5-trimethyl benzene	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
Tert-butyl benzene	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
1,2,4-trimethyl benzene	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
1,3-dichlorobenzene	1	200	<1	NA	<1	<1	<1	<1	<1	NA
Sec-butyl benzene	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
1,4-dichlorobenzene	1	400	<1	NA	<1	<1	<1	<1	<1	NA
4-isopropyl toluene	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
1,2-dichlorobenzene	1	15000	<1	NA	<1	<1	<1	<1	<1	NA
n-butyl benzene	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
1,2-dibromo-3-chloropropane	1	NSL	<1	NA	<1	<1	<1	<1	<1	NA
1,2,4-trichlorobenzene	1	300	<1	NA	<1	<1	<1	<1	<1	NA
1,2,3-trichlorobenzene	1		<1	NA	<1	<1	<1	<1	<1	NA
Hexachlorobutadiene	1	7	<1	NA	<1	<1	<1	<1	<1	NA
Polycyclic Aromatic Hydrocarbons (PAHs)										
Naphthalene	0.2	NSL	<0.2	<0.2	<0.2	NA	<0.2	<0.2	<0.1	NA
Acenaphthylene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	NA
Acenaphthene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	NA
Fluorene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	NA
Phenanthrene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	NA
Anthracene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	NA
Fluoranthene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	NA
Pyrene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	NA
Benzo(a)anthracene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	NA
Chrysene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	NA
Benzo(b,j+k)fluoranthene	0.2	NSL	<0.2	<0.2	<0.2	NA	<0.2	<0.2	<0.2	NA
Benzo(a)pyrene	0.1	0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	NA
Indeno(1,2,3-c,d)pyrene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	NA
Dibenzo(a,h)anthracene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	NA
Benzo(g,h,i)perylene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	NA

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

TABLE G3
GROUNDWATER LABORATORY RESULTS COMPARED TO SITE SPECIFIC HSLs - RISK ASSESSMENT
All results in µg/L unless stated otherwise.

	PQL Envirolab Services	NHMRC ADWG 2011	WHO 2008	USEPA RSL Tapwater 2017	SAMPLES							
					MW1	MW1 (Lab Duplicate)	MW2	MW2 (Lab Duplicate)	MW3	SDUP1 (MW1)	SDUP2 (MW2)	SDUP2 (Lab Duplicate)
Total Recoverable Hydrocarbons (TRH)												
C_6-C_9 Aliphatics (assessed using F1)	10	-	100	-	<10	NA	<10	<10	<10	<10	<10	NA
>C_9-C_{14} Aliphatics (assessed using F2)	50	-	100	-	<50	[NT]	<50	NA	<50	<50	<50	NA
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)												
Benzene	1	1	-	-	<1	NA	**3**	**3**	<1	<1	**3**	NA
Toluene	1	800	-	-	<1	NA	<1	<1	<1	<1	<1	NA
Ethylbenzene	1	300	-	-	<1	NA	<1	<1	<1	<1	<1	NA
Total xylenes	2	600	-	-	<2	NA	<2	<2	<2	<2	<2	NA
Polycyclic Aromatic Hydrocarbons (PAHs)												
Naphthalene	1	-	-	6.1	<1	NA	<1	<1	<1	<1	<1	NA
Volatile Organic Compounds (VOCs), including chlorinated VOCs												
Dichlorodifluoromethane	10	-	-	-	<10	NA	<10	<10	<10	<10	<10	NA
Chloromethane	10	-	-	-	<10	NA	<10	<10	<10	<10	<10	NA
Vinyl Chloride	10	0.3	-	-	<10	NA	<10	<10	<10	<10	<10	NA
Bromomethane	10	-	-	-	<10	NA	<10	<10	<10	<10	<10	NA
Chloroethane	10	-	-	-	<10	NA	<10	<10	<10	<10	<10	NA
Trichlorofluoromethane	10	-	-	-	<10	NA	<10	<10	<10	<10	<10	NA
1,1-Dichloroethene	1	30	-	-	<1	NA	<1	<1	<1	<1	<1	NA
Trans-1,2-dichloroethene	1	60	-	-	<1	NA	<1	<1	<1	<1	<1	NA
1,1-dichloroethane	1	-	-	-	<1	NA	<1	<1	<1	<1	<1	NA
Cis-1,2-dichloroethene	1	60	-	-	<1	NA	<1	<1	<1	<1	<1	NA
Bromochloromethane	1	250	-	-	<1	NA	**<1**	**<1**	<1	<1	**<1**	NA
Chloroform	1		-	-	<1	NA	**2**	**2**	<1	<1	**2**	NA
2,2-dichloropropane	1	-	-	-	<1	NA	<1	<1	<1	<1	<1	NA
1,2-dichloroethane	1	3	-	-	<1	NA	<1	<1	<1	<1	<1	NA
1,1,1-trichloroethane	1	-	-	-	<1	NA	<1	<1	<1	<1	<1	NA
1,1-dichloropropene	1	-	-	-	<1	NA	<1	<1	<1	<1	<1	NA
Cyclohexane	1	-	-	-	<1	NA	<1	<1	<1	<1	<1	NA
Carbon tetrachloride	1	3	-	-	<1	NA	<1	<1	<1	<1	<1	NA
Benzene	1	1	-	-	<1	NA	**3**	**3**	<1	<1	**3**	NA
Dibromomethane	1	-	-	-	<1	NA	<1	<1	<1	<1	<1	NA
1,2-dichloropropane	1	-	-	-	<1	NA	<1	<1	<1	<1	<1	NA
Trichloroethene	1	-	-	-	<1	NA	<1	<1	<1	<1	<1	NA
Bromodichloromethane	1	-	-	-	<1	NA	<1	<1	<1	<1	<1	NA
trans-1,3-dichloropropene	1	100	-	-	<1	NA	<1	<1	<1	<1	<1	NA
cis-1,3-dichloropropene	1	100	-	-	<1	NA	<1	<1	<1	<1	<1	NA
1,1,2-trichloroethane	1	-	-	-	<1	NA	<1	<1	<1	<1	<1	NA
Toluene	1	800	-	-	<1	NA	<1	<1	<1	<1	<1	NA
1,3-dichloropropane	1	-	-	-	<1	NA	<1	<1	<1	<1	<1	NA
Dibromochloromethane	1	-	-	-	<1	NA	<1	<1	<1	<1	<1	NA
1,2-dibromoethane	1	-	-	-	<1	NA	<1	<1	<1	<1	<1	NA
Tetrachloroethene	1	50	-	-	<1	NA	<1	<1	<1	<1	<1	NA
1,1,1,2-tetrachloroethane	1	-	-	-	<1	NA	<1	<1	<1	<1	<1	NA
Chlorobenzene	1	300	-	-	<1	NA	<1	<1	<1	<1	<1	NA
Ethylbenzene	1	300	-	-	<1	NA	<1	<1	<1	<1	<1	NA
Bromoform	1	-	-	-	<1	NA	<1	<1	<1	<1	<1	NA
m+p-xylene	2	-	-	-	<2	NA	<2	<2	<2	<2	<2	NA
Styrene	1	30	-	-	<1	NA	<1	<1	<1	<1	<1	NA
1,1,2,2-tetrachloroethane	1	-	-	-	<1	NA	<1	<1	<1	<1	<1	NA
o-xylene	1	-	-	-	<1	NA	<1	<1	<1	<1	<1	NA
1,2,3-trichloropropane	1	-	-	-	<1	NA	<1	<1	<1	<1	<1	NA
Isopropylbenzene	1	-	-	-	<1	NA	<1	<1	<1	<1	<1	NA
Bromobenzene	1	-	-	-	<1	NA	<1	<1	<1	<1	<1	NA
n-propyl benzene	1	-	-	-	<1	NA	<1	<1	<1	<1	<1	NA
2-chlorotoluene	1	-	-	-	<1	NA	<1	<1	<1	<1	<1	NA
4-chlorotoluene	1	-	-	-	<1	NA	<1	<1	<1	<1	<1	NA
1,3,5-trimethyl benzene	1	-	-	-	<1	NA	<1	<1	<1	<1	<1	NA
Tert-butyl benzene	1	-	-	-	<1	NA	<1	<1	<1	<1	<1	NA
1,2,4-trimethyl benzene	1	-	-	-	<1	NA	<1	<1	<1	<1	<1	NA
1,3-dichlorobenzene	1	20	-	-	<1	NA	<1	<1	<1	<1	<1	NA
Sec-butyl benzene	1	-	-	-	<1	NA	<1	<1	<1	<1	<1	NA
1,4-dichlorobenzene	1	40	-	-	<1	NA	<1	<1	<1	<1	<1	NA
4-isopropyl toluene	1	-	-	-	<1	NA	<1	<1	<1	<1	<1	NA
1,2-dichlorobenzene	1	1500	-	-	<1	NA	<1	<1	<1	<1	<1	NA
n-butyl benzene	1	-	-	-	<1	NA	<1	<1	<1	<1	<1	NA
1,2-dibromo-3-chloropropane	1	-	-	-	<1	NA	<1	<1	<1	<1	<1	NA
1,2,4-trichlorobenzene	1	30	-	-	<1	NA	<1	<1	<1	<1	<1	NA
1,2,3-trichlorobenzene	1		-	-	<1	NA	<1	<1	<1	<1	<1	NA
Hexachlorobutadiene	1	7	-	-	<1	NA	<1	<1	<1	<1	<1	NA

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

JKEnvironments

TABLE QW1
GROUNDWATER QA/QC SUMMARY

		Dichlorodifluoromethane	Chloromethane	Vinyl Chloride	Bromomethane	Chloroethane	Trichlorofluoromethane	1,1-Dichloroethene	Trans-1,2-dichloroethene	1,1-dichloroethane	Cis-1,2-dichloroethene	Bromochloromethane	Chloroform	2,2-dichloropropane	1,2-dichloroethane	1,1,1-trichloroethane	1,1-dichloropropene	Cyclohexane	Carbon tetrachloride	Benzene	Dibromomethane	1,2-dichloropropane	Trichloroethene	Bromodichloromethane	trans-1,3-dichloropropene	cis-1,3-dichloropropene	1,1,2-trichloroethane	Toluene	1,3-dichloropropane	Dibromochloromethane
	PQL Envirolab SYD	*10*	*10*	*10*	*10*	*10*	*10*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
	PQL Envirolab VIC	*10*	*10*	*10*	*10*	*10*	*10*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Intra	MW1	<10	<10	<10	<10	<10	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
laboratory	SDUP1 (MW1)	<10	<10	<10	<10	<10	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
duplicate	MEAN	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Inter	MW2	<10	<10	<10	<10	<10	<10	<1	<1	<1	<1	<1	2	<1	<1	<1	<1	<1	<1	3	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
laboratory	SDUP2 (MW2)	<10	<10	<10	<10	<10	<10	<1	<1	<1	<1	<1	2	<1	<1	<1	<1	<1	<1	3	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
duplicate	MEAN	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	2	nc	nc	nc	nc	nc	nc	3	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	0%	nc	nc	nc	nc	nc	nc	0%	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Trip	TB-W1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Blank	10/08/2023																													
Field	FR-W1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Rinsate	10/08/2023																													

		1,2-dibromoethane	Tetrachloroethene	1,1,1,2-tetrachloroethane	Chlorobenzene	Ethylbenzene	Bromoform	m+p-xylene	Styrene	1,1,2,2-tetrachloroethane	o-xylene	1,2,3-trichloropropane	Isopropylbenzene	Bromobenzene	n-propyl benzene	2-chlorotoluene	4-chlorotoluene	1,3,5-trimethyl benzene	Tert-butyl benzene	1,2,4-trimethyl benzene	1,3-dichlorobenzene	Sec-butyl benzene	1,4-dichlorobenzene	4-isopropyl toluene	1,2-dichlorobenzene	n-butyl benzene	1,2-dibromo-3-chloropropane	1,2,4-trichlorobenzene	Hexachlorobutadiene	1,2,3-trichlorobenzene
	PQL Envirolab SYD	*1*	*1*	*1*	*1*	*1*	*1*	*2*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
	PQL Envirolab VIC	*1*	*1*	*1*	*1*	*1*	*1*	*2*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Intra	MW1	<1	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
laboratory	SDUP1 (MW1)	<1	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
duplicate	MEAN	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Inter	MW2	<1	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
laboratory	SDUP2 (MW2)	<1	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
duplicate	MEAN	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Trip	TB-W1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Blank	10/08/2023																													
Field	FR-W1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Rinsate	10/08/2023																													

		TRH C6 - C10	TRH >C10-C16	TRH >C16-C34	TRH >C34-C40	Benzene	Toluene	Ethylbenzene	m+p-xylene	o-Xylene	Naphthalene	Acenaphthylene	Acenaph-thene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b,j+k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-c,d)pyrene	Dibenzo(a,h)anthra-cene	Benzo(g,h,i)perylene	Arsenic	Cadmium	Chromium VI	Copper	Lead	Mercury	Nickel	Zinc
	PQL Envirolab SYD	*10*	*50*	*100*	*100*	*1*	*1*	*1*	*2*	*1*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*1*	*0.1*	*1*	*1*	*1*	*0.05*	*1*	*1*
	PQL Envirolab VIC	*10*	*50*	*100*	*100*	*1.0*	*1.0*	*1.0*	*2.0*	*1.0*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*1*	*0.1*	*1*	*1*	*1*	*0.05*	*1*	*1*
Intra	MW1	<10	<50	<100	<100	<1	<1	<1	<2	<1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1	<0.1	2	6	<1	<0.05	1	17
laboratory	SDUP1 (MW1)	<10	<50	<100	<100	<1	<1	<1	<2	<1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	1	<0.1	2	6	<1	<0.05	1	16
duplicate	MEAN	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	0.75	nc	2	6	nc	nc	1	16.5
	RPD %	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	67%	nc	0%	0%	nc	nc	0%	6%
Inter	MW2	<10	<50	<100	<100	3	<1	<1	<2	<1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	1	<0.1	2	7	1	<0.05	2	23
laboratory	SDUP2 (MW2)	<10	<50	<100	<100	3	<1	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	1	<0.1	2	7	1	3	25	<0.05
duplicate	MEAN	nc	nc	nc	nc	3	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	1	nc	2	7	1	1.5125	13.5	11.75
	RPD %	nc	nc	nc	nc	0%	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	0%	nc	0%	0%	0%	197%	170%	191%
Trip	TB-W1	<10	<50	<100	<100	<1	<1	<1	<2	<1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<1	<1	<1	<0.05	<1	<1
Blank	10/08/2023																																
Field	FR-W1	89	<50	<100	<100	<1	<1	<1	<2	<1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<1	760	1	<0.05	<1	5
Rinsate	10/08/2023																																
Trip	TS-W1	-	-	-	-	113%	104%	113%	103%	103%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Spike	10/08/2023																																

Result outside of QA/QC acceptance criteria | Value

ABBREVIATIONS AND EXPLANATIONS

Abbreviations used in the Tables:

CT:	Contaminant Threshold
FTS:	Fluorotelomer sulfonic acid
NA:	Not Analysed
NC:	Not Calculated
NEMP	National Environmental Management Plan
NSL:	No Set Limit
PFAS	Per- and polyfluoroalkyl substances
PFHxS	Perfluorohexanesulfonic acid
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctanesulfonic acid
PQL:	Practical Quantitation Limit
RS:	Rinsate Sample
SAC:	Site Assessment Criteria
SCC:	Specific Contaminant Concentration
TB:	Trip Blank
TCLP:	Toxicity Characteristics Leaching Procedure
Trip	Trip Spike
UCL:	Upper Level Confidence Limit on Mean Value

Table Specific Explanations:

Groundwater Ecology Tables:

- 95% refers to a concentration that has been derived to protect 95% of aquatic species
- Statistical calculations are undertaken using ProUCL (USEPA). Statistical calculation is usually undertaken using data from fill samples.

Waste Classification and TCLP Table:

- Data assessed using the Addendum to the NSW EPA Waste Classification Guidelines, Part 1: Classifying Waste (2014) -October 2016

TABLE PW1
SUMMARY OF PFAS CONCENTRATIONS IN GROUNDWATER - ECOLOGY
All results in µg/L unless stated otherwise.

	PQL Envirolab Services	NEMP 2018 Interim 95% Marine	SAMPLES						
			MW1	MW1 (Lab Duplicate)	MW2	MW3	SDUP1 (MW1)	SDUP2 (MW2)	SDUP2 (Lab Duplicate)
PFAS Compound									
Perfluorobutanesulfonic acid	0.1	NSL	**0.0082**	**0.0082**	**0.0089**	**0.01**	**0.0082**	**0.0055**	**0.0055**
Perfluoropentanesulfonic acid	0.1	NSL	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluorohexanesulfonic acid - PFHxS	0.1	NSL	**0.0085**	**0.0086**	**0.0068**	**0.013**	**0.0085**	**0.0065**	**0.0065**
Perfluoroheptanesulfonic acid	0.1	NSL	**0.001**	**0.001**	<0.001	<0.001	**0.001**	<0.001	<0.001
Perfluorooctanesulfonic acid PFOS	0.1	0.13	**0.042**	**0.039**	**0.015**	**0.047**	**0.041**	**0.015**	**0.015**
Perfluorodecanesulfonic acid	0.2	NSL	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorobutanoic acid	0.2	NSL	**0.025**	**0.025**	**0.02**	**0.021**	**0.025**	**0.02**	**0.02**
Perfluoropentanoic acid	0.2	NSL	**0.04**	**0.041**	**0.01**	**0.044**	**0.039**	**0.01**	**0.01**
Perfluorohexanoic acid	0.1	NSL	**0.043**	**0.042**	**0.018**	**0.057**	**0.041**	**0.015**	**0.016**
Perfluoroheptanoic acid	0.1	NSL	**0.014**	**0.013**	**0.0063**	**0.019**	**0.013**	**0.0057**	**0.0059**
Trip	0.1	220	**0.027**	**0.025**	**0.012**	**0.027**	**0.026**	**0.014**	**0.013**
Perfluorononanoic acid	0.1	NSL	**0.003**	**0.003**	**0.002**	**0.007**	**0.003**	**0.002**	**0.002**
Perfluorodecanoic acid	0.5	NSL	<0.002	<0.002	<0.002	**0.007**	<0.002	<0.002	<0.002
Perfluoroundecanoic acid	0.5	NSL	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorododecanoic acid	0.5	NSL	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Perfluorotridecanoic acid	0.5	NSL	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorotetradecanoic acid	5	NSL	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4:2 FTS	0.1	NSL	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
6:2 FTS	0.1	NSL	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
8:2 FTS	0.1	NSL	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
10:2 FTS	0.1	NSL	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorooctane sulfonamide	1	NSL	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
N-Methyl perfluorooctane sulfonamide	1	NSL	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctanesulfon amide	1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
N-Me perfluorooctanesulfonamid oethanol	1	NSL	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Et perfluorooctanesulfonamid oethanol	5	NSL	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MePerfluorooctanesulf-amid oacetic acid	0.2	NSL	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
EtPerfluorooctanesulf-amid oacetic acid	0.2	NSL	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Positive PFHxS & PFOS	0.1	NSL	**0.051**	**0.048**	**0.022**	**0.061**	**0.05**	**0.022**	**0.022**
Total Positive PFOS & PFOA	0.1	NSL	**0.069**	**0.065**	**0.028**	**0.075**	**0.067**	**0.029**	**0.028**
Total Positive PFAS	0.1	NSL	**0.21**	**0.21**	**0.095**	**0.25**	**0.21**	**0.094**	**0.094**

Positive PFAS result	**Bold**
PFAS result above the SAC	**Bold**

JKEnvironments

TABLE PW2
SUMMARY OF PFAS CONCENTRATIONS IN GROUNDWATER - HUMAN HEALTH
All results in µg/L unless stated otherwise.

	PQL	NEMP 2020	SAMPLES						
	Envirolab Services	Recreational	MW1	MW1 (Lab Duplicate)	MW2	MW3	SDUP1 (MW1)	SDUP2 (MW2)	SDUP2 (Lab Duplicate)
PFAS Compound									
Perfluorobutanesulfonic acid	0.1	NSL	**0.0082**	**0.0082**	**0.0089**	**0.01**	**0.0082**	**0.0055**	**0.0055**
Perfluoropentanesulfonic acid	0.1	NSL	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluorohexanesulfonic acid - PFHxS	0.1	NSL	**0.0085**	**0.0086**	**0.0068**	**0.013**	**0.0085**	**0.0065**	**0.0065**
Perfluoroheptanesulfonic acid	0.1	NSL	**0.001**	**0.001**	<0.001	<0.001	**0.001**	<0.001	<0.001
Perfluorooctanesulfonic acid PFOS	0.1	NSL	**0.042**	**0.039**	**0.015**	**0.047**	**0.041**	**0.015**	**0.015**
Perfluorodecanesulfonic acid	0.2	NSL	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorobutanoic acid	0.2	NSL	**0.025**	**0.025**	**0.02**	**0.021**	**0.025**	**0.02**	**0.02**
Perfluoropentanoic acid	0.2	NSL	**0.04**	**0.041**	**0.01**	**0.044**	**0.039**	**0.01**	**0.01**
Perfluorohexanoic acid	0.1	NSL	**0.043**	**0.042**	**0.018**	**0.057**	**0.041**	**0.015**	**0.016**
Perfluoroheptanoic acid	0.1	NSL	**0.014**	**0.013**	**0.0063**	**0.019**	**0.013**	**0.0057**	**0.0059**
Trip	0.1	10	**0.027**	**0.025**	**0.012**	**0.027**	**0.026**	**0.014**	**0.013**
Perfluorononanoic acid	0.1	NSL	**0.003**	**0.003**	**0.002**	**0.007**	**0.003**	**0.002**	**0.002**
Perfluorodecanoic acid	0.5	NSL	<0.002	<0.002	<0.002	**0.007**	<0.002	<0.002	<0.002
Perfluoroundecanoic acid	0.5	NSL	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorododecanoic acid	0.5	NSL	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Perfluorotridecanoic acid	0.5	NSL	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorotetradecanoic acid	5	NSL	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4:2 FTS	0.1	NSL	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
6:2 FTS	0.1	NSL	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
8:2 FTS	0.1	NSL	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
10:2 FTS	0.1	NSL	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorooctane sulfonamide	1	NSL	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
N-Methyl perfluorooctane sulfonamide	1	NSL	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctanesulfon amide	1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
N-Me perfluorooctanesulfonamid oethanol	1	NSL	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Et perfluorooctanesulfonamid oethanol	5	NSL	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MePerfluorooctanesulf-amid oacetic acid	0.2	NSL	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
EtPerfluorooctanesulf-amid oacetic acid	0.2	NSL	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Positive PFHxS & PFOS	0.1	2	**0.051**	**0.048**	**0.022**	**0.061**	**0.05**	**0.022**	**0.022**
Total Positive PFOS & PFOA	0.1	NSL	**0.069**	**0.065**	**0.028**	**0.075**	**0.067**	**0.029**	**0.028**
Total Positive PFAS	0.1	NSL	**0.21**	**0.21**	**0.095**	**0.25**	**0.21**	**0.094**	**0.094**

Positive PFAS result	**Bold**
PFAS result above the SAC	**Bold**

JKEnvironments

TABLE PS1
SUMMARY OF PFAS CONCENTRATIONS IN SOIL - ECOLOGY
Units are µg/Kg unless stated otherwise.

	PQL Envirolab Services	NEMP 2020 Direct exposure All land use	BH1 0.2-0.3 Fill - Silty Sand	BH1 0.2-0.3 Lab Duplicate	BH2 0.15-0.3 Fill - Gravel	TP5 0.1-0.2 Fill - Silty Sand	BH6 0.1-0.3 Fill - Silty Sand	BH7 0-0.1 Fill - Silty Sand	BH8 0.1-0.2 Fill - Silty Sand	BH9 0.12-0.2 Fill - Silty Sand	TP10 0-0.1 Fill - Silty Sand	TP10 0-0.1 Lab Duplicate	SDUP3 (intra-lab) 0-0.1 Field Duplicate of BH7	SDUP5 (inter-lab) 0-0.1 Field Duplicate of TP10
PFAS Compound														
Perfluorobutanesulfonic acid	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	**0.1**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanesulfonic acid	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorohexanesulfonic acid - PFHxS	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	**0.2**	<0.1	<0.1	**0.4**	**0.6**	**0.3**	**0.2**
Perfluoroheptanesulfonic acid	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorooctanesulfonic acid PFOS	0.1	1000	<0.1	<0.1	<0.1	**0.8**	<0.1	**14.0**	**1.0**	**0.3**	**6.7**	**6.5**	**14.0**	**4.3**
Perfluorodecanesulfonic acid	0.2	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	**2.0**	<0.2	<0.2	**0.2**	<0.2	**2.0**	**0.3**
Perfluorobutanoic acid	0.2	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	**0.3**	<0.2	<0.2	<0.2	<0.2	**0.4**	<0.2
Perfluoropentanoic acid	0.2	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	**0.8**	<0.2	<0.2	**0.3**	**0.4**	**0.9**	**0.2**
Perfluorohexanoic acid	0.1	NSL	<0.1	<0.1	<0.1	**0.2**	<0.1	**0.5**	<0.1	<0.1	**0.1**	**0.1**	**0.5**	<0.5
Perfluoroheptanoic acid	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	**0.3**	<0.1	<0.1	<0.1	<0.1	**0.4**	<0.1
Trip	0.1	10,000	<0.1	<0.1	<0.1	**0.3**	<0.1	**0.9**	<0.1	<0.1	**0.3**	**0.4**	**1.0**	**0.2**
Perfluorononanoic acid	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	**0.4**	<0.1	<0.1	**0.2**	**0.1**	**0.4**	**0.1**
Perfluorodecanoic acid	0.5	NSL	<0.5	<0.5	<0.5	**0.6**	<0.5	**2.0**	<0.5	<0.5	**0.8**	**0.8**	**2.0**	**0.7**
Perfluoroundecanoic acid	0.5	NSL	<0.5	<0.5	<0.5	<0.5	<0.5	**0.8**	<0.5	<0.5	<0.5	<0.5	**0.7**	<0.5
Perfluorododecanoic acid	0.5	NSL	<0.5	<0.5	<0.5	<0.5	<0.5	**1.0**	<0.5	<0.5	**1.0**	**1.0**	**1.0**	**1.0**
Perfluorotridecanoic acid	0.5	NSL	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Perfluorotetradecanoic acid	5	NSL	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
4:2 FTS	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
6:2 FTS	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
8:2 FTS	0.1	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
10:2 FTS	0.1	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Perfluorooctane sulfonamide	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
N-Methyl perfluorooctane sulfonamide	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
N-Ethyl perfluorooctanesulfon amide	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
N-Me perfluorooctanesulfonamid oethanol	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
N-Et perfluorooctanesulfonamid oethanol	5	NSL	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
MePerfluorooctanesulf-amid oacetic acid	0.2	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1
EtPerfluorooctanesulf-amid oacetic acid	0.2	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1
Total Positive PFHxS & PFOS	0.1	NSL	<0.1	<0.1	<0.1	**0.8**	<0.1	**14.0**	**1.0**	**0.3**	**7.1**	**7.0**	**15.0**	**4.5**
Total Positive PFOS & PFOA	0.1	NSL	<0.1	<0.1	<0.1	**1.1**	<0.1	**15.0**	**1.0**	**0.3**	**7.0**	**6.9**	**15.0**	**4.5**
Total Positive PFAS	0.1	NSL	<0.1	<0.1	<0.1	**1.9**	<0.1	**23.0**	**1.0**	**0.3**	**10.0**	**10.0**	**24.0**	**7.0**

Positive PFAS result	**Bold**
PFAS result above the SAC	**Bold**

JKEnvironments

TABLE PS2
SUMMARY OF PFAS CONCENTRATIONS IN SOIL - HUMAN HEALTH
Units are µg/Kg unless stated otherwise.

	PQL Envirolab Services	NEMP 2020 Residential min. access	BH1 0.2-0.3 Fill - Silty Sand	BH1 0.2-0.3 Lab Duplicate	BH2 0.15-0.3 Fill - Gravel	TP5 0.1-0.2 Fill - Silty Sand	BH6 0.1-0.3 Fill - Silty Sand	BH7 0-0.1 Fill - Silty Sand	BH8 0.1-0.2 Fill - Silty Sand	BH9 0.12-0.2 Fill - Silty Sand	TP10 0-0.1 Fill - Silty Sand	TP10 0-0.1 Lab Duplicate	SDUP3 (intra-lab) 0-0.1 Field Duplicate of BH7	SDUP5 (inter-lab) 0-0.1 Field Duplicate of TP10
PFAS Compound														
Perfluorobutanesulfonic acid	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	**0.1**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanesulfonic acid	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorohexanesulfonic acid - PFHxS	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	**0.2**	<0.1	<0.1	**0.4**	**0.6**	**0.3**	**0.2**
Perfluoroheptanesulfonic acid	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorooctanesulfonic acid PFOS	0.1	NSL	<0.1	<0.1	<0.1	**0.8**	<0.1	**14.0**	**1.0**	**0.3**	**6.7**	**6.5**	**14.0**	**4.3**
Perfluorodecanesulfonic acid	0.2	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	**2.0**	<0.2	<0.2	**0.2**	<0.2	**2.0**	**0.3**
Perfluorobutanoic acid	0.2	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	**0.3**	<0.2	<0.2	<0.2	<0.2	**0.4**	<0.2
Perfluoropentanoic acid	0.2	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	**0.8**	<0.2	<0.2	**0.3**	**0.4**	**0.9**	**0.2**
Perfluorohexanoic acid	0.1	NSL	<0.1	<0.1	<0.1	**0.2**	<0.1	**0.5**	<0.1	<0.1	**0.1**	**0.1**	**0.5**	<0.5
Perfluoroheptanoic acid	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	**0.3**	<0.1	<0.1	<0.1	<0.1	**0.4**	<0.1
Trip	0.1	20,000	<0.1	<0.1	<0.1	**0.3**	<0.1	**0.9**	<0.1	<0.1	**0.3**	**0.4**	**1.0**	**0.2**
Perfluorononanoic acid	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	**0.4**	<0.1	<0.1	**0.2**	**0.1**	**0.4**	**0.1**
Perfluorodecanoic acid	0.5	NSL	<0.5	<0.5	<0.5	**0.6**	<0.5	**2.0**	<0.5	<0.5	**0.8**	**0.8**	**2.0**	**0.7**
Perfluoroundecanoic acid	0.5	NSL	<0.5	<0.5	<0.5	<0.5	<0.5	**0.8**	<0.5	<0.5	<0.5	<0.5	**0.7**	<0.5
Perfluorododecanoic acid	0.5	NSL	<0.5	<0.5	<0.5	<0.5	<0.5	**1.0**	<0.5	<0.5	**1.0**	**1.0**	**1.0**	**1.0**
Perfluorotridecanoic acid	0.5	NSL	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Perfluorotetradecanoic acid	5	NSL	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
4:2 FTS	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
6:2 FTS	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
8:2 FTS	0.1	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
10:2 FTS	0.1	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Perfluorooctane sulfonamide	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
N-Methyl perfluorooctane sulfonamide	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
N-Ethyl perfluorooctanesulfon amide	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
N-Me perfluorooctanesulfonamid oethanol	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
N-Et perfluorooctanesulfonamid oethanol	5	NSL	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
MePerfluorooctanesulf-amid oacetic acid	0.2	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1
EtPerfluorooctanesulf-amid oacetic acid	0.2	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1
Total Positive PFHxS & PFOS	0.1	2,000	<0.1	<0.1	<0.1	**0.8**	<0.1	**14.0**	**1.0**	**0.3**	**7.1**	**7.0**	**15.0**	**4.5**
Total Positive PFOS & PFOA	0.1	NSL	<0.1	<0.1	<0.1	**1.1**	<0.1	**15.0**	**1.0**	**0.3**	**7.0**	**6.9**	**15.0**	**4.5**
Total Positive PFAS	0.1	NSL	<0.1	<0.1	<0.1	**1.9**	<0.1	**23.0**	**1.0**	**0.3**	**10.0**	**10.0**	**24.0**	**7.0**

Positive PFAS result	**Bold**
PFAS result above the SAC	**Bold**

TABLE PS3
SUMMARY OF PFAS CONCENTRATIONS IN SOIL - WASTE CLASSIFICATION
Units are µg/Kg unless stated otherwise.

	PQL Envirolab Services	SCC1	SCC2	BH1 0.2-0.3 Fill - Silty Sand	BH1 0.2-0.3 Lab Duplicate	BH2 0.15-0.3 Fill - Gravel	TP5 0.1-0.2 Fill - Silty Sand	BH6 0.1-0.3 Fill - Silty Sand	BH7 0-0.1 Fill - Silty Sand	BH8 0.1-0.2 Fill - Silty Sand	BH9 0.12-0.2 Fill - Silty Sand	TP10 0-0.1 Fill - Silty Sand	TP10 0-0.1 Lab Duplicate	SDUP3 (intra-lab) 0-0.1 Field Duplicate of BH7	SDUP5 (inter-lab) 0-0.1 Field Duplicate of TP10
PFAS Compound															
Perfluorobutanesulfonic acid	0.1	NSL	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanesulfonic acid	0.1	NSL	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorohexanesulfonic acid - PFHxS	0.1	NSL	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.1	0.4	0.6	0.3	0.2
Perfluoroheptanesulfonic acid	0.1	NSL	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorooctanesulfonic acid PFOS	0.1	NSL	NSL	<0.1	<0.1	<0.1	0.8	<0.1	14.0	1.0	0.3	6.7	6.5	14.0	4.3
Perfluorodecanesulfonic acid	0.2	NSL	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	2.0	<0.2	<0.2	0.2	<0.2	2.0	0.3
Perfluorobutanoic acid	0.2	NSL	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	0.3	<0.2	<0.2	<0.2	<0.2	0.4	<0.2
Perfluoropentanoic acid	0.2	NSL	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	0.8	<0.2	<0.2	0.3	0.4	0.9	0.2
Perfluorohexanoic acid	0.1	NSL	NSL	<0.1	<0.1	<0.1	0.2	<0.1	0.5	<0.1	<0.1	0.1	0.1	0.5	<0.5
Perfluoroheptanoic acid	0.1	NSL	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	0.3	<0.1	<0.1	<0.1	<0.1	0.4	<0.1
Trip	0.1	18,000	72,000	<0.1	<0.1	<0.1	0.3	<0.1	0.9	<0.1	<0.1	0.3	0.4	1.0	0.2
Perfluorononanoic acid	0.1	NSL	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	0.4	<0.1	<0.1	0.2	0.1	0.4	0.1
Perfluorodecanoic acid	0.5	NSL	NSL	<0.5	<0.5	<0.5	0.6	<0.5	2.0	<0.5	<0.5	0.8	0.8	2.0	0.7
Perfluoroundecanoic acid	0.5	NSL	NSL	<0.5	<0.5	<0.5	<0.5	<0.5	0.8	<0.5	<0.5	<0.5	<0.5	0.7	<0.5
Perfluorododecanoic acid	0.5	NSL	NSL	<0.5	<0.5	<0.5	<0.5	<0.5	1.0	<0.5	<0.5	1.0	1.0	1.0	1.0
Perfluorotridecanoic acid	0.5	NSL	NSL	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Perfluorotetradecanoic acid	5	NSL	NSL	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
4:2 FTS	0.1	NSL	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
6:2 FTS	0.1	NSL	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
8:2 FTS	0.1	NSL	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
10:2 FTS	0.1	NSL	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Perfluorooctane sulfonamide	1	NSL	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
N-Methyl perfluorooctane sulfonamide	1	NSL	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
N-Ethyl perfluorooctanesulfon amide	1	NSL	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
N-Me perfluorooctanesulfonamid oethanol	1	NSL	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
N-Et perfluorooctanesulfonamid oethanol	5	NSL	NSL	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
MePerfluorooctanesulf-amid oacetic acid	0.2	NSL	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1
EtPerfluorooctanesulf-amid oacetic acid	0.2	NSL	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1
Total Positive PFHxS & PFOS	0.1	1800	7,200	<0.1	<0.1	<0.1	0.8	<0.1	14.0	1.0	0.3	7.1	7.0	15.0	4.5
Total Positive PFOS & PFOA	0.1	NSL	NSL	<0.1	<0.1	<0.1	1.1	<0.1	15.0	1.0	0.3	7.0	6.9	15.0	4.5
Total Positive PFAS	0.1	NSL	NSL	<0.1	<0.1	<0.1	1.9	<0.1	23.0	1.0	0.3	10.0	10.0	24.0	7.0

Result above SCC1 Criteria	**Bold**
Result above SCC2 Criteria	**Bold**

TABLE PQS1
SUMMARY OF PFAS FIELD QA/QC IN SOIL
Units are µg/Kg unless stated otherwise.

			Perfluorobutanesulfonic acid	Perfluoropentanesulfonic acid	Perfluorohexanesulfonic acid - PFHxS	Perfluoroheptanesulfonic acid	Perfluorooctanesulfonic acid PFOS	Perfluorodecanesulfonic acid	Perfluorobutanoic acid	Perfluoropentanoic acid	Perfluorohexanoic acid	Perfluoroheptanoic acid	Perfluorooctanoic acid PFOA	Perfluorononanoic acid	Perfluorodecanoic acid	Perfluoroundecanoic acid	Perfluorododecanoic acid	Perfluorotridecanoic acid	Perfluorotetradecanoic acid	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	Perfluorooctane sulfonamide	N-Methyl perfluorooctane sulfonamide	N-Ethyl perfluorooctanesulfon amide	N-Me perfluorooctanesulfonamid oethanol	N-Et perfluorooctanesulfonamid oethanol	MePerfluorooctanesulf-amid oacetic acid	EtPerfluorooctanesulf-amid oacetic acid	Total Positive PFHxS & PFOS	Total Positive PFOS & PFOA	Total Positive PFAS
PQL Envirolab			*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.2*	*0.2*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*0.5*	*0.5*	*0.5*	*0.5*	*5*	*0.1*	*0.1*	*0.1*	*0.1*	*1*	*1*	*1*	*1*	*5*	*0.2*	*0.2*	*0.1*	*0.1*	*0.1*
PQL Envirolab VIC			*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.2*	*0.2*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*0.5*	*0.5*	*0.5*	*0.5*	*5*	*0.1*	*0.1*	*0.1*	*0.1*	*1*	*1*	*1*	*1*	*5*	*0.2*	*0.2*	*0.1*	*0.1*	*0.1*
Intra	BH7	0-0.1	0.1	<0.1	0.2	<0.1	14	2	0.3	0.8	0.5	0.3	0.9	0.4	2	0.8	1	<0.5	<5	<0.1	<0.1	<0.2	<0.2	<1	<1	<1	<1	<5	<0.2	<0.2	14	15	23
laboratory	SDUP3 (intra-lab)	0-0.1	<0.1	<0.1	0.3	<0.1	14	2	0.4	0.9	0.5	0.4	1	0.4	2	0.7	1	<0.5	<5	<0.1	<0.1	<0.2	<0.2	<1	<1	<1	<1	<5	<0.2	<0.2	15	15	24
duplicate	MEAN		0.075	nc	0.25	nc	14	2	0.35	0.85	0.5	0.35	0.95	0.4	2	0.75	1	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	14.5	15	23.5
	RPD %		67%	nc	40%	nc	0%	0%	29%	12%	0%	29%	11%	0%	0%	13%	0%	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	7%	0%	4%
Inter	TP10	0-0.1	<0.1	<0.1	0.4	<0.1	6.7	0.2	<0.2	0.3	0.1	<0.1	0.3	0.2	0.8	<0.5	1	<0.5	<5	<0.1	<0.1	<0.2	<0.2	<1	<1	<1	<1	<5	<0.2	<0.2	7.1	7	10
laboratory	SDUP5 (inter-lab)	0-0.1	<0.1	<0.1	0.2	<0.1	4.3	0.3	<0.2	0.2	<0.5	<0.1	0.2	0.1	0.7	<0.5	1	<0.5	<5	<0.1	<0.1	<0.2	<0.2	<1	<1	<1	<1	<5	<1	<1	4.5	4.5	7
duplicate	MEAN		nc	nc	0.3	nc	5.5	0.25	nc	0.25	0.075	nc	0.25	0.15	0.75	nc	1	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	5.8	5.75	8.5
	RPD %		nc	nc	67%	nc	44%	40%	nc	40%	67%	nc	40%	67%	13%	nc	0%	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	45%	43%	35%
Trip	TB-S1	31/07/2023	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<5	<0.1	<0.1	<0.2	<0.2	<1	<1	<1	<1	<5	<0.2	<0.2	<0.1	<0.1	<0.1
Blank	31/07/2023																																
Trip	TB-S2	1/08/2023	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<5	<0.1	<0.1	<0.2	<0.2	<1	<1	<1	<1	<5	<0.2	<0.2	<0.1	<0.1	<0.1
Blank	1/08/2023																																
Field	FR1-SPT	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.05	<0.1	<0.5	<0.01	<0.01	<0.02	<0.02	<0.1	<0.05	<0.1	<0.05	<0.5	<0.02	<0.02	<0.01	<0.01	<0.01
Rinsate	31/07/2023																																
Field	FR2-HA	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.05	<0.1	<0.5	<0.01	<0.01	<0.02	<0.02	<0.1	<0.05	<0.1	<0.05	<0.5	<0.02	<0.02	<0.01	<0.01	<0.01
Rinsate	1/08/2023																																

Result outside of QA/QC acceptance criteria: Value

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TABLE
SUMMARY OF PFAS FIELD QA/QC IN GROUNDWATER
Units are µg/L unless stated otherwise.

		Perfluorobutanesulfonic acid	Perfluoropentanesulfonic acid	Perfluorohexanesulfonic acid - PFHxS	Perfluoroheptanesulfonic acid	Perfluorooctanesulfonic acid PFOS	Perfluorodecanesulfonic acid	Perfluorobutanoic acid	Perfluoropentanoic acid	Perfluorohexanoic acid	Perfluoroheptanoic acid	Perfluorooctanoic acid PFOA	Perfluorononanoic acid	Perfluorodecanoic acid	Perfluoroundecanoic acid	Perfluorododecanoic acid	Perfluorotridecanoic acid	Perfluorotetradecanoic acid	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	Perfluorooctane sulfonamide	N-Methyl perfluorooctane sulfonamide	N-Ethyl perfluorooctanesulfon amide	N-Me perfluorooctanesulfonamid oethanol	N-Et perfluorooctanesulfonamid oethanol	MePerfluorooctanesulf-amid oacetic acid	EtPerfluorooctanesulf-amid oacetic acid	Total Positive PFHxS & PFOS	Total Positive PFOS & PFOA	Total Positive PFAS
PQL Envirolab		*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.2*	*0.2*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*0.5*	*0.5*	*0.5*	*0.5*	*5*	*0.1*	*0.1*	*0.1*	*0.1*	*1*	*1*	*1*	*1*	*5*	*0.2*	*0.2*	*0.1*	*0.1*	*0.1*
PQL Envirolab VIC		*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.2*	*0.2*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*0.5*	*0.5*	*0.5*	*0.5*	*5*	*0.1*	*0.1*	*0.1*	*0.1*	*1*	*1*	*1*	*1*	*5*	*0.2*	*0.2*	*0.1*	*0.1*	*0.1*
Intra	MW1	0.0082	<0.001	0.0085	0.001	0.042	<0.002	0.025	0.04	0.043	0.014	0.027	0.003	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.05	<0.1	<0.05	<0.5	<0.002	<0.002	0.051	0.069	0.21
laboratory	SDUP1 (MW1)	0.0082	<0.001	0.0085	0.001	0.041	<0.002	0.025	0.039	0.041	0.013	0.026	0.003	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.05	<0.1	<0.05	<0.5	<0.002	<0.002	0.05	0.067	0.21
duplicate	MEAN	0.0082	nc	0.0085	0.001	0.0415	nc	0.025	0.0395	0.042	0.0135	0.0265	0.003	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	0.0505	0.068	0.21
	RPD %	0%	nc	0%	0%	2%	nc	0%	3%	5%	7%	4%	0%	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	2%	3%	0%
Inter	MW2	0.0089	<0.001	0.0068	<0.001	0.015	<0.002	0.02	0.01	0.018	0.0063	0.012	0.002	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.05	<0.1	<0.05	<0.5	<0.002	<0.002	0.022	0.028	0.095
laboratory	SDUP2 (MW2)	0.0055	<0.001	0.0065	<0.001	0.015	<0.002	0.02	0.01	0.015	0.0057	0.014	0.002	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.05	<0.1	<0.05	<0.5	<0.002	<0.002	0.022	0.029	0.094
duplicate	MEAN	0.0072	nc	0.0067	nc	0.015	nc	0.02	0.01	0.0165	0.006	0.013	0.002	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	0.022	0.0285	0.0945
	RPD %	47%	nc	5%	nc	0%	nc	0%	0%	18%	10%	15%	0%	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	0%	4%	1%
Trip	TB-W1	NA	NA	<0.0002	NA	<0.0002	NA	NA	NA	NA	NA	<0.0002	NA	NA	NA	NA	NA	NA	NA	<0.0004	<0.0004	NA	NA	NA	NA	NA	NA	NA	NA	<0.0002	<0.0002	<0.0002
Blank	10/08/2023																															
Field	FR-W1	NA	NA	<0.0002	NA	<0.0002	NA	NA	NA	NA	NA	<0.0002	NA	NA	NA	NA	NA	NA	NA	<0.0004	<0.0004	NA	NA	NA	NA	NA	NA	NA	NA	<0.0002	<0.0002	<0.0002
Rinsate	10/08/2023																															

Result outside of QA/QC acceptance criteria Value

ABBREVIATIONS AND EXPLANATIONS FOR ACID SULFATE SOIL TABLE

Abbreviations used in the Tables:

ANC_{BT}	Acid Neutralising Capacity - Back Titration
ANCE	Excess Acid Neutralising Capacity
$CaCO_3$	Calcium Carbonate
kg	kilogram
mol H^+/t	moles hydrogen per tonne
pHF	Field pH
pHFOX	Field peroxide pH
pH_{KCl}	Pottasium chloride pH
S	Sulfur
SCr	The symbol given to the result from the Chromium Reducible Sulfur method
S_{NAS}	Net Acid Soluble Sulfur
% w/w	Percentage by mass

Results have been assessed against the criteria specified in Table 1.1 of National Acid sulfate Soil Guidance - National acid sulfate soil identification and laboratory method manual. Water Quality Australia. June 2018

TABLE A
SUMMARY OF LABORATORY RESULTS - ACID SULFATE SOIL ANALYSIS

Soil Texture: Coarse		Analysis	pH_F and pH_{FOX}					Actual Acidity (Titratable Actual Acidity - TAA)	Potential Sulfidic Acidity		Retained Acidity	Acid Neutralising Capacity (ANC_{BT})	a-Net Acidity without ANCE	s-Net Acidity without ANCE	Liming Rate - without ANCE
			pH_F	pH_{FOX}	Reaction	pH_F - pH_{FOX}	pH_{KCL}	(mol H^+/t)	(% SCr)	(mol H^+/t)	($\%S_{NAS}$)	(% $CaCO_3$)	(mol H^+/t)	(%w/w S)	(kg $CaCO_3$/tonne)
National Acid Sulfate Soils Guidance (2018)			-	-	-	-	-	-	-	-	-	-	18	0.03	-
Sample Reference	**Sample Depth (m)**	**Sample Description**													
BH1	0.7-1.0	Sandstone	6.1	6.4	Low reaction	-0.3	6.7	<5	0.007	4	NA	1	<5	0.007	<0.75
BH2	0.15-0.3	Sandstone	8.2	6.5	Medium reaction	1.7	6.3	<5	0.01	8	NA	NA	7.8	0.012	<0.75
BH2	0.8-1.0	Sandstone	5.6	6.1	Low reaction	-0.5	5.3	<5	<0.005	<3	NA	NA	<5	0.006	<0.75
BH3	0.2-0.4	Sandstone	8.6	6.8	Medium reaction	1.8	7.5	<5	0.006	4	NA	0.4	<5	0.006	<0.75
BH3	1.0-1.1	Sandstone	5.7	4.1	Medium reaction	1.6	4.5	26	0.01	7	NA	NA	**32.0**	**0.052**	2.4
Total Number of Samples			5	5	5	5	5	5	5	5	-	2	5	5	5
Minimum Value			5.6	4.1	-	-0.5	4.5	<5	0.006	4	-	0.40	7.8	0.006	<0.75
Maximum Value			8.6	6.8	-	1.8	7.5	26	0.01	8	-	1.00	32.0	0.052	2.4

Values Exceeding Action Criteria **VALUE**

Appendix D: Borehole and Test pit Logs

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **BH/MW1**

1/1

SDUP1: 0.7-1.0m

Client: TIME AND PLACE DEVELOPMENT PTY LTD

Project: PROPOSED RESIDENTIAL DEVELOPMENT

Location: 45-53 MACLEAY STREET, POTTS POINT, NSW

Job No.: E34303B **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 31/7/23 **Datum:** -

Plant Type: JK309 **Logged/Checked by:** C.R./V.B.

Groundwater Record	SAMPLES ES	ASS	ASB	PFAS	DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION							0			CONCRETE: 130mm.t over				10mm DIA. REINFORCEMENT, 70mm TOP COVER
										GRANULAR ROADBASE: 70mm.t				SCREEN: 2.5kg 0.13-0.2m, NO FCF
							0.5		-	FILL: Silty sand, fine to coarse grained, yellow brown, dark grey and grey, with fine to medium grained igneous and sandstone gravel, trace of clay fines.	M			APPEARS POORLY COMPACTED
														INSUFFICENT RETURN FOR BULK SAMPLE
							1		-	SANDSTONE: fine to coarse grained, light grey and grey.	MW	M		HAWKESBURY SANDSTONE MODERATE 'TC' BIT RESISTANCE
							1.5 2 2.5 3 3.5			REFER TO JKG CORED BOREHOLE LOG				REFER TO JKG BOREHOLE LOG FOR GROUNDWATER MONITORING WELL INSTALLATION DETAILS

JKGeotechnics

BOREHOLE LOG

Borehole No.
1

Client: TIME & PLACE DEVELOPENT PTY LTD
Project: PROPOSED REDEVELOPMENT
Location: 45-53 MACLEAY STREET, POTTS POINT, NSW

Job No.: 34303RE **Method:** SPIRAL AUGER **R.L. Surface:** N/A
Date: 31/7/23 **Datum:** AHD
Plant Type: JK309 **Logged/Checked By:** Q.V./M.E.

Groundwater Record	SAMPLES ES	U50	DB	DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION OF AUGERING								-	CONCRETE: 130mm.t over				10mm DIA. REINFORCEMENT, 70mm TOP COVER
								-	GRANULAR ROADBASE: 70mm.t	M			
					N > 4 3,4/ 50mm REFUSAL				FILL: Silty sand, fine to coarse grained, yellow brown, dark grey and grey, with fine to medium grained igneous and sandstone gravel, trace of clay fines.				APPEARS POORLY COMPACTED
						1		-	SANDSTONE: fine to coarse grained, light grey and grey.	SW	L - M		HAWKESBURY SANDSTONE MODERATE 'TC' BIT RESISTANCE
						2 3 4 5 6			REFER TO CORED BOREHOLE LOG				GROUNDWATER MONITORING WELL INSTALLED TO 15.12m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 1.12m TO 15.12m. CASING 1.12m TO 0.05m. 2mm SAND FILTER PACK 1.0m TO 15.12m. BENTONITE SEAL 0.1m TO 1.0m. COMPLETED WITH A CONCRETED GATIC COVER.

JKGeotechnics

CORED BOREHOLE LOG

Client: TIME & PLACE DEVELOPENT PTY LTD
Project: PROPOSED REDEVELOPMENT
Location: 45-53 MACLEAY STREET, POTTS POINT, NSW

Job No.: 34303RE	**Core Size:** NMLC	**R.L. Surface:** N/A
Date: 31/7/23	**Inclination:** VERTICAL	**Datum:** AHD
Plant Type: JK309	**Bearing:** N/A	**Logged/Checked By:** Q.V./M.E.

START CORING AT 1.19m

Depth (m)	CORE DESCRIPTION (Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components)	Weathering	Strength	Point Load Strength Index $I_s(50)$
1.19	SANDSTONE: fine to medium grained, light brown, with occasional dark grey laminae, bedded at 0-25°.	SW	L - M	0.40, 0.20, 0.30
2.2	as above, but light grey.			0.30, 0.60, 0.50, 0.30
3.36	SANDSTONE: fine to medium grained, light grey, with occasional dark grey laminae, bedded at 0-20°.	FR	L - M	0.70, 0.40
4.62			VL	0.080
4.8			M	0.30, 0.70, 0.80, 1.0, 1.0
7.6	SANDSTONE: fine to coarse grained, light grey, bedded at 0-5°.			0.90

Water Loss\Level: ON 10/8/23 (at about 2.2m); 90% RETURN

Formation: Hawkesbury Sandstone

DEFECT DETAILS (Type, orientation, defect shape and roughness, defect coatings and seams, openness and thickness)

- (2.38m) Be, 15°, P, R, Clay FILLED, 2 mm.t
- (2.71m) J, 70°, P, R, Fe Sn
- (3.10m) XWS, 0°, 4 mm.t
- (3.20m) XWS, 0°, 10 mm.t
- (3.33m) J, 25°, Un, R, Clay FILLED, 2 mm.t
- (4.62m) XWS, 0°, 40 mm.t
- (4.70m) XWS, 0°, 20 mm.t
- (4.92m) XWS, 0°, 35 mm.t
- (5.24m) CS, 0°, 40 mm.t
- (6.48m) Be, 5°, P, R, Clay FILLED, 2 mm.t
- (7.49m) XWS, 0°, 15 mm.t
- (7.97m) J, 20°, C, R, Clay FILLED, 2 mm.t

FRACTURES NOT MARKED ARE CONSIDERED TO BE DRILLING AND HANDLING BREAKS

Client: TIME & PLACE DEVELOPENT PTY LTD
Project: PROPOSED REDEVELOPMENT
Location: 45-53 MACLEAY STREET, POTTS POINT, NSW

Job No.: 34303RE	**Core Size:** NMLC	**R.L. Surface:** N/A
Date: 31/7/23	**Inclination:** VERTICAL	**Datum:** AHD
Plant Type: JK309	**Bearing:** N/A	**Logged/Checked By:** Q.V./M.E.

Water Loss\Level	Barrel Lift	Depth (m)	CORE DESCRIPTION Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$	DEFECT DETAILS – DESCRIPTION Type, orientation, defect shape and roughness, defect coatings and seams, openness and thickness – Specific	Formation
100% RETURN		9, 10, 11	SANDSTONE: fine to coarse grained, light grey, bedded at 0-5°. *(continued)*	FR	M	0.70		Hawkesbury Sandstone
					L	0.20	(8.97m) J, 75°, C, R, Cn	
					M	0.70, 0.70, 0.70, 0.60, 0.50		
90% RETURN		12				0.60	(11.87m) J, 30°, C, R, Cn	
			SANDSTONE: fine to medium grained, grey and dark grey, bedded at 0-15°.	SW	L - M	0.40, 0.30, 0.40	(12.27m) XWS, 5°, 5 mm.t (12.52m) XWS, 0°, 10 mm.t (12.59m) Be, 0°, P, S, Cb Ct (12.62m) J, 70 - 90°, C, R, Clay FILLED, 2 mm.t	
		13	LAMINITE: fine to medium grained, light grey and dark grey, very thinly to thickly bedded at 0-15°.	MW	VL	0.060	(12.82m) J, 20°, C, R, Cn (12.87m) J, 90°, C, R, Clay FILLED, 2 mm.t (12.89m) XWS, 0°, 25 mm.t (13.22m) XWS, 0°, 30 mm.t	
				SW	M	0.50, 0.70	(13.93m) CS, 0°, 20 mm.t	
100% RETURN		14	as above, but light brown and dark grey.			0.40, 0.60	(14.68m) XWS, 0°, 10 mm.t	
			as below		H	1.6		

FRACTURES NOT MARKED ARE CONSIDERED TO BE DRILLING AND HANDLING BREAKS

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CORED BOREHOLE LOG

Borehole No.
1

Client: TIME & PLACE DEVELOPENT PTY LTD
Project: PROPOSED REDEVELOPMENT
Location: 45-53 MACLEAY STREET, POTTS POINT, NSW

Job No.: 34303RE **Core Size:** NMLC **R.L. Surface:** N/A
Date: 31/7/23 **Inclination:** VERTICAL **Datum:** AHD
Plant Type: JK309 **Bearing:** N/A **Logged/Checked By:** Q.V./M.E.

Water Loss\Level	Barrel Lift	Depth (m)	Graphic Log	CORE DESCRIPTION Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ VL -0.1 L -0.3 M -1 H -3 VH -10 EH	DEFECT DETAILS SPACING (mm) 600 200 60 20	DEFECT DETAILS DESCRIPTION Type, orientation, defect shape and roughness, defect coatings and seams, openness and thickness Specific General	Formation
				SANDSTONE: fine to medium grained, light brown, bedded at 0-10°.	SW	H	1.4			
				END OF BOREHOLE AT 15.12 m						
		16								
		17								
		18								
		19								
		20								
		21								

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **BH/MW2**
1/1
SDUP2: 0.15-0.3m

Client: TIME AND PLACE DEVELOPMENT PTY LTD
Project: PROPOSED RESIDENTIAL DEVELOPMENT
Location: 45-53 MACLEAY STREET, POTTS POINT, NSW

Job No.: E34303B **Method:** SPIRAL AUGER **R.L. Surface:** N/A
Date: 31/7/23 **Datum:** -
Plant Type: JK309 **Logged/Checked by:** C.R./V.B.

Groundwater Record	SAMPLES (ES, ASS, ASB, PFAS, DB)	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION			0			CONCRETE: 120mm.t over				
						GRANULAR ROADBASE: 30mm.t	M			
					-	SANDSTONE: fine to coarse grained, yellow brown, light grey and orange brown.	HW	L		HAWKESBURY SANDSTONE
			0.5							
								L-M		LOW TO MODERATE 'TC' BIT RESISTANCE
			1							
						REFER TO JKG CORED BOREHOLE LOG				REFER TO JKG BOREHOLE LOG FOR GROUNDWATER MONITORING WELL INSTALLATION DETAILS
			1.5							
			2							
			2.5							
			3							
			3.5							

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BOREHOLE LOG

Borehole No.
2
1 / 3

Client: TIME & PLACE DEVELOPENT PTY LTD
Project: PROPOSED REDEVELOPMENT
Location: 45-53 MACLEAY STREET, POTTS POINT, NSW

Job No.: 34303RE **Method:** SPIRAL AUGER **R.L. Surface:** N/A
Date: 31/7/23 TO 1/8/23 **Datum:** AHD
Plant Type: JK309 **Logged/Checked By:** Q.V./M.E.

Groundwater Record	SAMPLES ES	U50	DB	DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION OF AUGERING									CONCRETE: 120mm.t over				10mm DIA. REINFORCEMENT, 70mm TOP COVER
								-	GRANULAR ROADBASE: 30mm.t				
								-	SANDSTONE: fine to coarse grained, light grey and orange brown.	SW	L		HAWKESBURY SANDSTONE
											L - M		LOW TO MODERATE 'TC' BIT RESISTANCE
						1							
									REFER TO CORED BOREHOLE LOG				GROUNDWATER MONITORING WELL INSTALLED TO 11.28m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 1.28m TO 11.28m. CASING 0.05m TO 1.28m. 2mm SAND FILTER PACK 1.0m TO 11.28m. BENTONITE SEAL 0.5m TO 1.0m. BACKFILLED WITH SAND TO 0.05m. COMPLETED WITH A CONCRETED GATIC COVER.
						2							
						3							
						4							
						5							
						6							

JK 9.02.4 LIB.GLB Log JK AUGERHOLE - MASTER 34303RE POTTSPOINT.GPJ <<DrawingFile>> 29/08/2023 12:17 10.01.00.01 Datgel Lab and In Situ Tool - DGD | Lib: JK 9.02.4 2019-05-31 Prj: JK 9.01.0 2018-03-20

CORED BOREHOLE LOG

Client: TIME & PLACE DEVELOPENT PTY LTD
Project: PROPOSED REDEVELOPMENT
Location: 45-53 MACLEAY STREET, POTTS POINT, NSW

Job No.: 34303RE	**Core Size:** NMLC	**R.L. Surface:** N/A
Date: 31/7/23 TO 1/8/23	**Inclination:** VERTICAL	**Datum:** AHD
Plant Type: JK309	**Bearing:** N/A	**Logged/Checked By:** Q.V./M.E.

START CORING AT 1.16m

Water Loss\Level	Depth (m)	Core Description (Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components)	Weathering	Strength	Point Load Strength Index $I_s(50)$	Defect Details – Description (Type, orientation, defect shape and roughness, defect coatings and seams, openness and thickness)	Formation
ON 10/8/23 (water level); 90% RETURN	1.16–2.9	SANDSTONE: fine to medium grained, light grey, with occasional grey laminae, bedded at 0-20°.	SW	L (to 2.8m), M	0.30, 0.20, 0.20	(1.36m) Be, 20°, P, R, Fe Vn; (1.40m) Be, 10°, P, R, Fe Vn; (1.63m) Be, 0°, P, R, Cn; (2.20m) Be, 20°, Un, R, Cn; (2.79m) XWS, 0°, 10 mm.t	Hawkesbury Sandstone
100% RETURN	2.9–7.3	SANDSTONE: fine to medium grained, light grey and grey, with occasional dark grey laminae, bedded at 0-20°.	FR	M	0.40, 0.40, 0.40, 0.50, 0.70, 0.70, 0.80, 0.50, 0.80	(3.01m) XWS, 0°, 65 mm.t; (3.78m) XWS, 0°, 30 mm.t; (4.29m) XWS, 0°, 40 mm.t; (4.87m) Be, 5°, P, R, Clay FILLED, 2 mm.t; (6.47m) Be, 5°, P, R, Clay FILLED, 1 mm.t; (7.12m) Be, 5°, P, R, Clay FILLED, 1 mm.t; (7.28m) XWS, 0°, 35 mm.t	Hawkesbury Sandstone
	7.3–8.0	SANDSTONE: fine to coarse grained, light grey, bedded at 0-5°.	FR	M	0.80, 0.80		Hawkesbury Sandstone

FRACTURES NOT MARKED ARE CONSIDERED TO BE DRILLING AND HANDLING BREAKS

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CORED BOREHOLE LOG

Borehole No.
2

Client: TIME & PLACE DEVELOPENT PTY LTD
Project: PROPOSED REDEVELOPMENT
Location: 45-53 MACLEAY STREET, POTTS POINT, NSW

Job No.: 34303RE **Core Size:** NMLC **R.L. Surface:** N/A
Date: 31/7/23 TO 1/8/23 **Inclination:** VERTICAL **Datum:** AHD
Plant Type: JK309 **Bearing:** N/A **Logged/Checked By:** Q.V./M.E.

Water Loss\Level	Barrel Lift	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	SPACING (mm) 600 200 60 20	DEFECT DETAILS – DESCRIPTION: Type, orientation, defect shape and roughness, defect coatings and seams, openness and thickness (Specific / General)	Formation
100% RETURN		9, 10, 11		SANDSTONE: fine to coarse grained, light grey, bedded at 0-5°. *(continued)*	FR	M	0.70, 0.90, 0.60, 0.50, 0.50, 0.60, 0.50			Hawkesbury Sandstone
		12, 13, 14		END OF BOREHOLE AT 11.28 m						

FRACTURES NOT MARKED ARE CONSIDERED TO BE DRILLING AND HANDLING BREAKS

JK 9.02.4 LIB.GLB Log JK CORED BOREHOLE - MASTER 34303RE POTTSPOINT.GPJ <<DrawingFile>> 29/08/2023 12:17 10.01.00.01 Datgel Lab and In Situ Tool - DGD | Lib: JK 9.02.4 2019-05-31 Prj: JK 9.01.0 2018-03-20

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ENVIRONMENTAL LOG

Log No. **BH/MW3**

1/1

Environmental logs are not to be used for geotechnical purposes

Client: TIME AND PLACE DEVELOPMENT PTY LTD

Project: PROPOSED RESIDENTIAL DEVELOPMENT

Location: 45-53 MACLEAY STREET, POTTS POINT, NSW

Job No.: E34303B **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 31/7/23 **Datum:** -

Plant Type: JK309 **Logged/Checked by:** Q.V./V.B.

Groundwater Record	SAMPLES ES	ASS	ASB	PFAS	DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION							0			CONCRETE: 200mm.t				5mm DIA. REINFORCEMENT, 30mm & 160mm TOP COVER
									-	SANDSTONE: fine to coarse grained, light grey, yellow brown and grey.	HW	L-M		HAWKESBURY SANDSTONE LOW TO MODERATE 'TC' BIT REWISTANCE
							0.5				MW	M		MODERATE RESISTANCE
							1							
							1.5			REFER TO JKG CORED BOREHOLE LOG				REFER TO JKG BOREHOLE LOG FOR GROUNDWATER MONITORING WELL INSTALLATION DETAILS
							2							
							2.5							
							3							
							3.5							

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BOREHOLE LOG

Borehole No.
3

Client: TIME & PLACE DEVELOPENT PTY LTD
Project: PROPOSED REDEVELOPMENT
Location: 45-53 MACLEAY STREET, POTTS POINT, NSW

Job No.: 34303RE **Method:** SPIRAL AUGER **R.L. Surface:** N/A
Date: 2/8/23 **Datum:** AHD
Plant Type: JK205 **Logged/Checked By:** Q.V./M.E.

Groundwater Record	SAMPLES ES	U50	DB	DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION OF AUGERING									CONCRETE: 200mm.t				5mm DIA. REINFORCEMENT, 30mm & 160mm TOP COVER
ON 10/8/23						1		-	SANDSTONE: fine to coarse grained, light grey and yellow brown.	SW	L - M		HAWKESBURY SANDSTONE LOW TO MODERATE 'TC' BIT RESISTANCE MODERATE RESISTANCE
						2 3 4 5 6			REFER TO CORED BOREHOLE LOG				GROUNDWATER MONITORING WELL INSTALLED TO 11.0m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 1.0m TO 11.0m. CASING 0.05m TO 1.0m. 2mm SAND FILTER PACK 0.9m TO 11.0m. BENTONITE SEAL 0.5m TO 0.9m. BACKFILLED WITH SAND TO 0.05m. COMPLETED WITH A CONCRETED GATIC COVER.

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CORED BOREHOLE LOG

Client: TIME & PLACE DEVELOPENT PTY LTD
Project: PROPOSED REDEVELOPMENT
Location: 45-53 MACLEAY STREET, POTTS POINT, NSW

Job No.: 34303RE | **Core Size:** NMLC | **R.L. Surface:** N/A
Date: 2/8/23 | **Inclination:** VERTICAL | **Datum:** AHD
Plant Type: JK205 | **Bearing:** N/A | **Logged/Checked By:** Q.V./M.E.

Water Loss\Level	Barrel Lift	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$	DEFECT DETAILS: DESCRIPTION (Type, orientation, defect shape and roughness, defect coatings and seams, openness and thickness) Specific / General	Formation
				START CORING AT 1.25m					
90% RETURN				SANDSTONE: fine to coarse grained, light grey and light brown, bedded at 0-5°.	SW	L	0.10, 0.20	(1.99m) XWS, 0°, 30 mm.t	Hawkesbury Sandstone
100% RETURN		2–3		SANDSTONE: fine to medium grained, light grey and grey, with occasional dark grey laminae, bedded at 0-20°.	FR	M	0.40, 0.40, 0.40, 0.30, 0.50, 0.40, 0.60, 0.50, 0.50, 0.70	(2.70m) XWS, 0°, 27 mm.t (3.05m) Be, 5°, P, R, Clay FILLED, 2 mm.t (4.44m) XWS, 10°, 60 mm.t (6.92m) Be, 0°, P, R, Clay FILLED, 1 mm.t (6.98m) XWS, 0°, 40 mm.t	
90% RETURN		7		SANDSTONE: fine to coarse grained, light grey, bedded at 0-5°.			0.60, 0.70	(7.32m) Be, 0°, P, R, Cn	

Point load scale: VL -0.1, L -0.3, M -1, H -3, VH -10, EH. Spacing (mm): 600, 200, 60, 20.

FRACTURES NOT MARKED ARE CONSIDERED TO BE DRILLING AND HANDLING BREAKS

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CORED BOREHOLE LOG

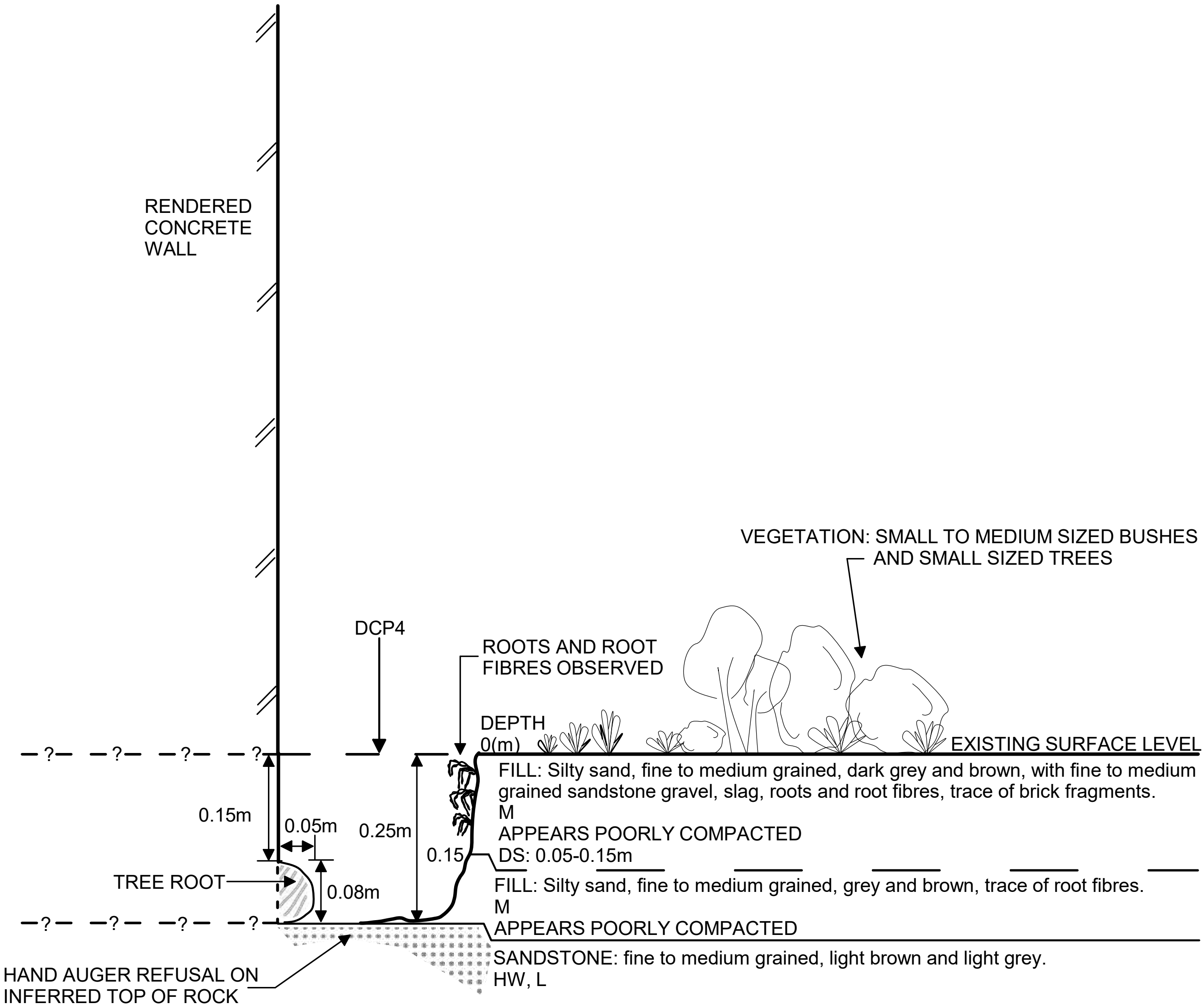
Borehole No.
3

Client: TIME & PLACE DEVELOPENT PTY LTD
Project: PROPOSED REDEVELOPMENT
Location: 45-53 MACLEAY STREET, POTTS POINT, NSW

Job No.: 34303RE **Core Size:** NMLC **R.L. Surface:** N/A
Date: 2/8/23 **Inclination:** VERTICAL **Datum:** AHD
Plant Type: JK205 **Bearing:** N/A **Logged/Checked By:** Q.V./M.E.

Water Loss\Level	Barrel Lift	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	DEFECT DETAILS: SPACING (mm) 600 200 60 20	DEFECT DETAILS: DESCRIPTION: Type, orientation, defect shape and roughness, defect coatings and seams, openness and thickness (Specific / General)	Formation
90% RETURN		9		SANDSTONE: fine to coarse grained, light grey, bedded at 0-5°. *(continued)*	FR	M	1.0, 0.90, 0.70, 0.80			Hawkesbury Sandstone
		10		SANDSTONE: fine to medium grained, light grey, with occasional grey laminae, bedded at 0-20°.			1.0, 0.70		(9.85m) Be, 0°, P, R, Cn (10.15m) Be, 10°, P, Po, Cn	
		11		END OF BOREHOLE AT 11.00 m						
		12								
		13								
		14								

FRACTURES NOT MARKED ARE CONSIDERED TO BE DRILLING AND HANDLING BREAKS



BASE OF FOOTING NOT OBSERVED DUE TO
TREE ROOT ON TOP OF INFERRED ROCK
BASE OF TEST PIT AT 0.25m DEPTH
'DRY' ON COMPLETION
REFER TO DCP TEST RESULTS SHEET

TEST PIT 4
CROSS SECTIONAL SKETCH
LOOKING EAST TO WEST

0 0.5
Scale 1:10 @A4 Metres

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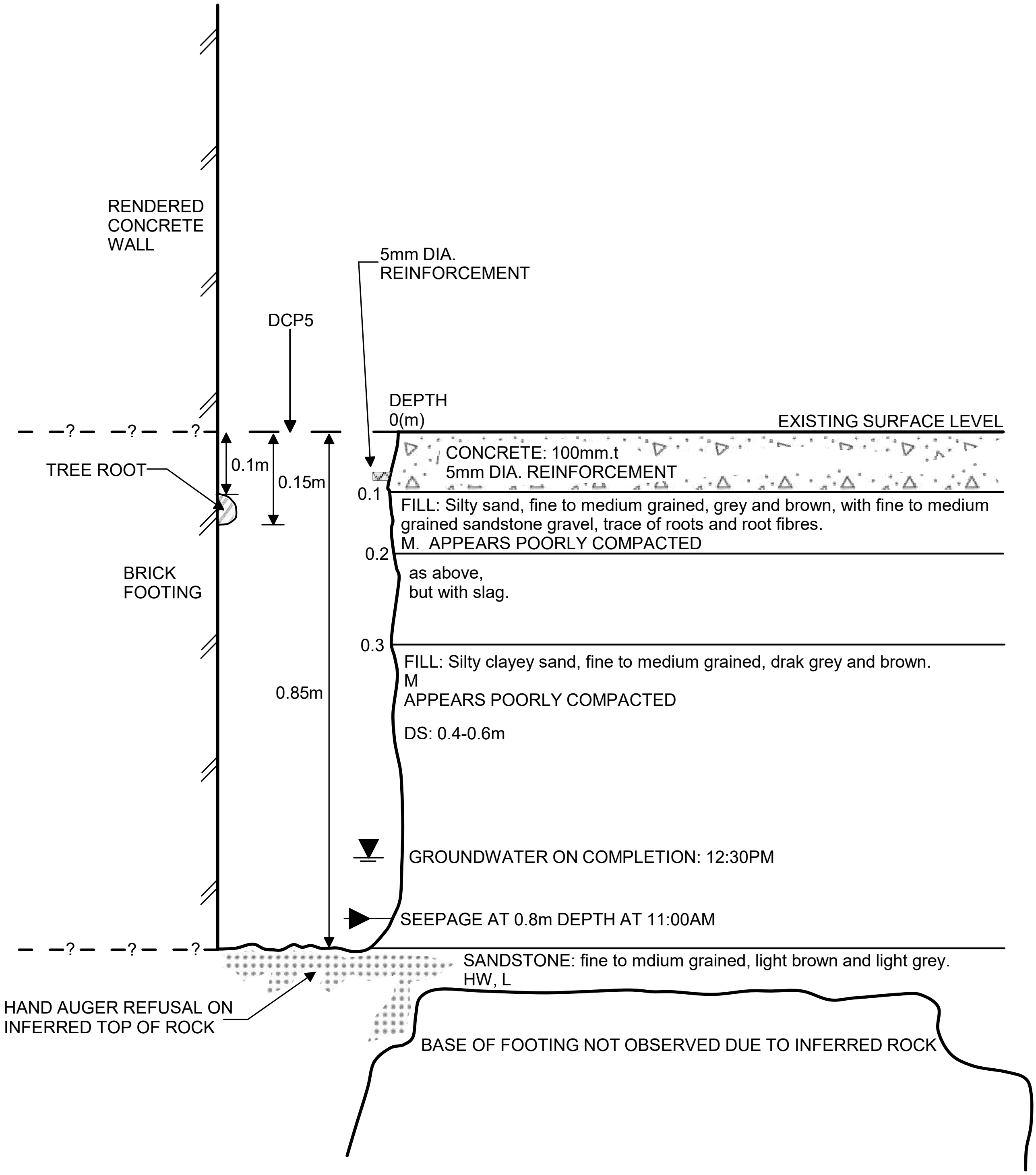
Report No. 34303RE Figure No. 3



BASE OF TEST PIT AT 0.85m DEPTH
GROUNDWATER AT 0.7m DEPTH ON COMPLETION
REFER TO DCP TEST RESULTS SHEET

TEST PIT 5
CROSS SECTIONAL SKETCH
LOOKING EAST TO WEST

0 0.5
Scale 1:10 @A4 Metres

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Report No. 34303RE Figure No. 4

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ENVIRONMENTAL LOG

Log No.	BH6	1/1

Environmental logs are not to be used for geotechnical purposes

Client: TIME AND PLACE DEVELOPMENT PTY LTD

Project: PROPOSED RESIDENTIAL DEVELOPMENT

Location: 45-53 MACLEAY STREET, POTS POINT, NSW

Job No.: E34303B **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 1/8/23 **Datum:** -

Plant Type: JK309 **Logged/Checked by:** A.D./V.B.

Groundwater Record	Samples (ES / ASS / ASB / PFAS / DB)	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION			0			CONCRETE: 100mm.t				NO OBSERVED REINFORCEMENT
					-	FILL: Silty sand, fine to medium grained, light grey and dark grey, trace of igneous and sandstone gravel.	M			SCREEN: 3.10kg 0.1-0.4m, NO FCF
					-	SANDSTONE: fine to medium grained, light grey and yellow.				HAWKESBURY SANDSTONE
			0.5			END OF BOREHOLE AT 0.5m				'TC' BIT REFUSAL ON SANDSTONE BEDROCK
			1							
			1.5							
			2							
			2.5							
			3							
			3.5							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **BH7**

1/1

SDUP3: 0-0.1m

Client: TIME AND PLACE DEVELOPMENT PTY LTD

Project: PROPOSED RESIDENTIAL DEVELOPMENT

Location: 45-53 MACLEAY STREET, POTS POINT, NSW

Job No.: E34303B **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 1/8/23 **Datum:** -

Plant Type: - **Logged/Checked by:** A.D./V.B.

Groundwater Record	SAMPLES (ES, ASS, ASB, PFAS, DB)	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION			0			FILL: Silty sand, fine to medium grained, brown, trace of igneous gravel, plastic fragments and root fibres.	D			LEAF LITTER COVER SCREEN: 10.18kg 0-0.2m, NO FCF
			0.5			FILL: Silty sand, fine to medium grained, light grey and dark grey, trace of igneous and sandstone gravel.	M			SCREEN: 10.27kg 0.2-0.65m, NO FCF
			1 1.5 2 2.5 3 3.5			END OF BOREHOLE AT 0.65m				

JKEnvironments

ENVIRONMENTAL LOG

Log No. **BH8** 1/1

Environmental logs are not to be used for geotechnical purposes

Client: TIME AND PLACE DEVELOPMENT PTY LTD
Project: PROPOSED RESIDENTIAL DEVELOPMENT
Location: 45-53 MACLEAY STREET, POTS POINT, NSW

Job No.: E34303B **Method:** SPIRAL AUGER **R.L. Surface:** N/A
Date: 1/8/23 **Datum:** -
Plant Type: JK309 **Logged/Checked by:** A.D./V.B.

Groundwater Record	SAMPLES ES	ASS	ASB	PFAS	DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION							0			CONCRETE: 100mm.t				NO OBSERVED REINFORCEMENT
									-	FILL: Silty sand, fine to medium grained, light grey and dark grey yellow brown, trace of igneous and sandstone gravel and concrete fragments,.	M			INSUFFICIENT RETURN FOR BLUK SCREEN
							0.5		-	SANDSTONE: fine to medium grained, light grey and yellow.	HW			HAWKESBURY SANDSTONE
										END OF BOREHOLE AT 0.6m				'TC' BIT REFUSAL ON SANDSTONE BEDROCK
							1							
							1.5							
							2							
							2.5							
							3							
							3.5							

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ENVIRONMENTAL LOG

Log No.
BH9
1/1

Environmental logs are not to be used for geotechnical purposes

Client: TIME AND PLACE DEVELOPMENT PTY LTD

Project: PROPOSED RESIDENTIAL DEVELOPMENT

Location: 45-53 MACLEAY STREET, POTS POINT, NSW

Job No.: E34303B **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 1/8/23 **Datum:** -

Plant Type: - **Logged/Checked by:** A.D./V.B.

Groundwater Record	SAMPLES ES	ASS	ASB	PFAS	DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION							0			CONCRETE: 120mm.t				NO OBSERVED REINFORCEMENT
									-	FILL: Silty sand, fine to medium grained, brown and grey, trace of igneous and sandstone gravel.	M			INSUFFICIENT RETURN FOR BLUK SCREEN
										FILL: Silty sand, fine to medium grained, brown, trace of sandstone gravel.	M			HAND AUGER REFUSAL ON INFERRED SANDSTONE BEDROCK
							0.5			END OF BOREHOLE AT 0.35m				
							1							
							1.5							
							2							
							2.5							
							3							
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Log No.
TP10
1/1

Environmental logs are not to be used for geotechnical purposes

SDUP5: 0-0.1m
Contamination & PFAS

Client: TIME AND PLACE DEVELOPMENT PTY LTD

Project: PROPOSED RESIDENTIAL DEVELOPMENT

Location: 45-53 MACLEAY STREET, POTS POINT, NSW

Job No.: E34303B **Method:** TEST PIT **R.L. Surface:** N/A

Date: 2/8/23 **Datum:** -

Plant Type: - **Logged/Checked by:** A.D./V.B.

Groundwater Record	SAMPLES: ES	ASS	ASB	PFAS	DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION							0			FILL: Silty sand, fine to medium grained, brown, trace of igneous and sandstone gravel, brick and concrete fragments, and root fibres.	M			SCREEN: 10.95kg 0-0.1m, NO FCF SCREEN: 1.78kg 0.1-0.2m, NO FCF
										END OF TEST PIT AT 0.2m				REFUSAL ON SANDSTONE BEEDROCK
							0.5							
							1							
							1.5							
							2							
							2.5							
							3							
							3.5							

ENVIRONMENTAL LOGS EXPLANATION NOTES

INTRODUCTION

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

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

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

DESCRIPTION AND CLASSIFICATION METHODS

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

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

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

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

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

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

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

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

INVESTIGATION METHODS

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

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

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

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

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

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

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

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

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

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

The test results are reported in the following form:

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

  N = 13
  4, 6, 7

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

  N > 30
  15, 30/40mm

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

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

LOGS

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

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

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

GROUNDWATER

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

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

More reliable measurements can be made by installing standpipes which are read after the groundwater level has stabilised at intervals ranging from several days to perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from perched water tables or surface water.

FILL

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

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

LABORATORY TESTING

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

SYMBOL LEGENDS

SOIL	ROCK
FILL	CONGLOMERATE
TOPSOIL	SANDSTONE
CLAY (CL, CI, CH)	SHALE/MUDSTONE
SILT (ML, MH)	SILTSTONE
SAND (SP, SW)	CLAYSTONE
GRAVEL (GP, GW)	COAL
SANDY CLAY (CL, CI, CH)	LAMINITE
SILTY CLAY (CL, CI, CH)	LIMESTONE
CLAYEY SAND (SC)	PHYLLITE, SCHIST
SILTY SAND (SM)	TUFF
GRAVELLY CLAY (CL, CI, CH)	GRANITE, GABBRO
CLAYEY GRAVEL (GC)	DOLERITE, DIORITE
SANDY SILT (ML, MH)	BASALT, ANDESITE
PEAT AND HIGHLY ORGANIC SOILS (Pt)	QUARTZITE

OTHER MATERIALS

BRICKS OR PAVERS

CONCRETE

ASPHALTIC CONCRETE

CLASSIFICATION OF COARSE AND FINE GRAINED SOILS

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

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

Laboratory Classification Criteria

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

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

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

NOTES:

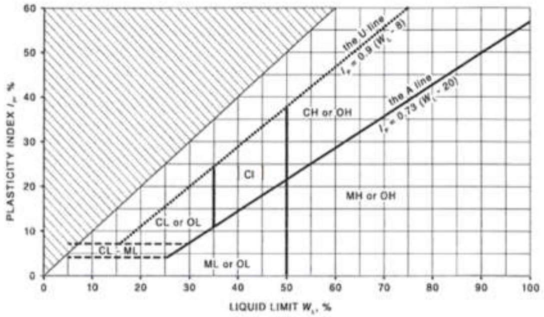
1 For a coarse grained soil with a fines content between 5% and 12%, the soil is given a dual classification comprising the two group symbols separated by a dash; for example, for a poorly graded gravel with between 5% and 12% silt fines, the classification is GP-GM.

2 Where the grading is determined from laboratory tests, it is defined by coefficients of curvature (C_c) and uniformity (C_u) derived from the particle size distribution curve.

3 Clay soils with liquid limits > 35% and ≤ 50% may be classified as being of medium plasticity.

4 The U line on the Modified Casagrande Chart is an approximate upper bound for most natural soils.

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



LOG SYMBOLS

Log Column	Symbol	Definition
Groundwater Record	▼ C ▶	Standing water level. Time delay following completion of drilling/excavation may be shown. Extent of borehole/test pit collapse shortly after drilling/excavation. Groundwater seepage into borehole or test pit noted during drilling or excavation.
Samples	ES U50 DB DS ASB ASS SAL PFAS	Sample taken over depth indicated, for environmental analysis. Undisturbed 50mm diameter tube sample taken over depth indicated. Bulk disturbed sample taken over depth indicated. Small disturbed bag sample taken over depth indicated. Soil sample taken over depth indicated, for asbestos analysis. Soil sample taken over depth indicated, for acid sulfate soil analysis. Soil sample taken over depth indicated, for salinity analysis. Soil sample taken over depth indicated, for analysis of Per- and Polyfluoroalkyl Substances.
Field Tests	N = 17 4, 7, 10	Standard Penetration Test (SPT) performed between depths indicated by lines. Individual figures show blows per 150mm penetration. 'Refusal' refers to apparent hammer refusal within the corresponding 150mm depth increment.
	N_c = 5 7 3R	Solid Cone Penetration Test (SCPT) performed between depths indicated by lines. Individual figures show blows per 150mm penetration for 60° solid cone driven by SPT hammer. 'R' refers to apparent hammer refusal within the corresponding 150mm depth increment.
	VNS = 25 PID = 100	Vane shear reading in kPa of undrained shear strength. Photoionisation detector reading in ppm (soil sample headspace test).
Moisture Condition (Fine Grained Soils) (Coarse Grained Soils)	*w* > PL *w* ≈ PL *w* < PL *w* ≈ LL *w* > LL D M W	Moisture content estimated to be greater than plastic limit. Moisture content estimated to be approximately equal to plastic limit. Moisture content estimated to be less than plastic limit. Moisture content estimated to be near liquid limit. Moisture content estimated to be wet of liquid limit. DRY – runs freely through fingers. MOIST – does not run freely but no free water visible on soil surface. WET – free water visible on soil surface.
Strength (Consistency) Cohesive Soils	VS S F St VSt Hd Fr ( )	VERY SOFT – unconfined compressive strength ≤ 25kPa. SOFT – unconfined compressive strength > 25kPa and ≤ 50kPa. FIRM – unconfined compressive strength > 50kPa and ≤ 100kPa. STIFF – unconfined compressive strength > 100kPa and ≤ 200kPa. VERY STIFF – unconfined compressive strength > 200kPa and ≤ 400kPa. HARD – unconfined compressive strength > 400kPa. FRIABLE – strength not attainable, soil crumbles. Bracketed symbol indicates estimated consistency based on tactile examination or other assessment.
Density Index/ Relative Density (Cohesionless Soils)	 VL L MD D VD ( )	**Density Index (I_D) Range (%)** / **SPT 'N' Value Range (Blows/300mm)** VERY LOOSE ≤ 15 / 0 – 4 LOOSE > 15 and ≤ 35 / 4 – 10 MEDIUM DENSE > 35 and ≤ 65 / 10 – 30 DENSE > 65 and ≤ 85 / 30 – 50 VERY DENSE > 85 / > 50 Bracketed symbol indicates estimated density based on ease of drilling or other assessment.

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

Classification of Material Weathering

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

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

Rock Material Strength Classification

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

Appendix E: Laboratory Report(s) & COC Documents

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CERTIFICATE OF ANALYSIS 38969

Client Details

Client	JK Environments
Attention	Vittal Boggaram
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E34303B**
Number of Samples	2 Soil
Date samples received	08/08/2023
Date completed instructions received	08/08/2023

Analysis Details

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

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

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

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

Report Details

Date results requested by	11/08/2023
Date of Issue	11/08/2023

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Results Approved By
Azrin Akram, Senior Chemist
Suk Lee, Organic Supervisor
Tara White, Metals Team Leader
Tianna Milburn, Senior Chemist

Authorised By
Pamela Adams, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil			
Our Reference		38969-1	38969-2
Your Reference	UNITS	SDUP4	SDUP5
Date Sampled		02/08/2023	02/08/2023
Type of sample		Soil	Soil
Date extracted	-	08/08/2023	08/08/2023
Date analysed	-	09/08/2023	09/08/2023
vTRH C_6 - C_9	mg/kg	<25	<25
vTRH C_6 - C_{10}	mg/kg	<25	<25
TRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25
Benzene	mg/kg	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1
m+p-xylene	mg/kg	<2	<2
o-Xylene	mg/kg	<1	<1
Naphthalene	mg/kg	<1	<1
Total BTEX	mg/kg	<1	<1
Total +ve Xylenes	mg/kg	<1	<1
Surrogate aaa-Trifluorotoluene	%	77	76

TRH Soil C10-C40 NEPM			
Our Reference		38969-1	38969-2
Your Reference	UNITS	SDUP4	SDUP5
Date Sampled		02/08/2023	02/08/2023
Type of sample		Soil	Soil
Date extracted	-	08/08/2023	08/08/2023
Date analysed	-	10/08/2023	10/08/2023
TRH C_{10} - C_{14}	mg/kg	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	820
TRH C_{29} - C_{36}	mg/kg	<100	1,300
Total +ve TRH (C10-C36)	mg/kg	<50	2,200
TRH >C_{10} -C_{16}	mg/kg	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	1,800
TRH >C_{34} -C_{40}	mg/kg	<100	840
Total +ve TRH (>C10-C40)	mg/kg	<50	2,600
Surrogate o-Terphenyl	%	109	128

PAHs in Soil			
Our Reference		38969-1	38969-2
Your Reference	UNITS	SDUP4	SDUP5
Date Sampled		02/08/2023	02/08/2023
Type of sample		Soil	Soil
Date extracted	-	08/08/2023	08/08/2023
Date analysed	-	10/08/2023	10/08/2023
Naphthalene	mg/kg	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	0.1
Anthracene	mg/kg	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	0.2
Pyrene	mg/kg	<0.1	0.3
Benzo(a)anthracene	mg/kg	<0.1	0.1
Chrysene	mg/kg	<0.1	0.1
Benzo(b,j&k)fluoranthene	mg/kg	<0.2	0.3
Benzo(a)pyrene	mg/kg	<0.05	0.14
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	0.2
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	0.2
Total +ve PAH's	mg/kg	<0.05	1.7
Benzo(a)pyrene TEQ calc (Zero)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc (Half)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc (PQL)	mg/kg	<0.5	<0.5
Surrogate p-Terphenyl-d_{14}	%	140	108

OCP in Soil		
Our Reference		38969-2
Your Reference	UNITS	SDUP5
Date Sampled		02/08/2023
Type of sample		Soil
Date extracted	-	08/08/2023
Date analysed	-	10/08/2023
alpha-BHC	mg/kg	<0.1
Hexachlorobenzene	mg/kg	<0.1
beta-BHC	mg/kg	<0.1
gamma-BHC	mg/kg	<0.1
Heptachlor	mg/kg	<0.1
delta-BHC	mg/kg	<0.1
Aldrin	mg/kg	<0.1
Heptachlor Epoxide	mg/kg	<0.1
gamma-Chlordane	mg/kg	<0.1
alpha-chlordane	mg/kg	<0.1
Endosulfan I	mg/kg	<0.1
pp-DDE	mg/kg	<0.1
Dieldrin	mg/kg	<0.1
Endrin	mg/kg	<0.1
Endosulfan II	mg/kg	<0.1
pp-DDD	mg/kg	<0.1
Endrin Aldehyde	mg/kg	<0.1
pp-DDT	mg/kg	<0.1
Endosulfan Sulphate	mg/kg	<0.1
Methoxychlor	mg/kg	<0.1
Total +ve reported Aldrin + Dieldrin	mg/kg	<0.1
Total +ve reported DDT+DDD+DDE	mg/kg	<0.1
Surrogate 2-chlorophenol-d4	%	106

OP in Soil		
Our Reference		38969-2
Your Reference	UNITS	SDUP5
Date Sampled		02/08/2023
Type of sample		Soil
Date extracted	-	08/08/2023
Date analysed	-	10/08/2023
Azinphos-methyl	mg/kg	<0.1
Bromophos-ethyl	mg/kg	<0.1
Chlorpyrifos	mg/kg	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1
Diazinon	mg/kg	<0.1
Dichlorovos	mg/kg	<0.1
Dimethoate	mg/kg	<0.1
Ethion	mg/kg	<0.1
Fenitrothion	mg/kg	<0.1
Malathion	mg/kg	<0.1
Parathion	mg/kg	<0.1
Ronnel	mg/kg	<0.1
Coumaphos	mg/kg	<0.1
Disulfoton	mg/kg	<0.1
Fenamiphos	mg/kg	<0.1
Fenthion	mg/kg	<0.1
Methidathion	mg/kg	<0.1
Mevinphos	mg/kg	<0.1
Methyl Parathion	mg/kg	<0.1
Phorate	mg/kg	<0.1
Phosalone	mg/kg	<0.1
Surrogate 2-chlorophenol-d4	%	106

PCBs in Soil		
Our Reference		38969-2
Your Reference	UNITS	SDUP5
Date Sampled		02/08/2023
Type of sample		Soil
Date extracted	-	08/08/2023
Date analysed	-	10/08/2023
Total PCB (Arochlor 1016-1260)	mg/kg	0.9
Surrogate 2-fluorobiphenyl	%	126

Acid Extractable metals in soil			
Our Reference		38969-1	38969-2
Your Reference	UNITS	SDUP4	SDUP5
Date Sampled		02/08/2023	02/08/2023
Type of sample		Soil	Soil
Date digested	-	09/08/2023	09/08/2023
Date analysed	-	09/08/2023	09/08/2023
Arsenic	mg/kg	<4	<4
Cadmium	mg/kg	<0.4	1
Chromium	mg/kg	3	26
Copper	mg/kg	7	91
Lead	mg/kg	2	370
Mercury	mg/kg	<0.1	0.3
Nickel	mg/kg	<1	15
Zinc	mg/kg	3	390

PFAS in Soil Extended		
Our Reference		38969-2
Your Reference	UNITS	SDUP5
Date Sampled		02/08/2023
Type of sample		Soil
Date prepared	-	10/08/2023
Date analysed	-	10/08/2023
Perfluorobutanesulfonic acid	µg/kg	<0.1
Perfluoropentanesulfonic acid	µg/kg	<0.1
Perfluorohexanesulfonic acid PFHxS	µg/kg	0.2
Perfluoroheptanesulfonic acid	µg/kg	<0.1
Perfluorooctanesulfonic acid PFOS	µg/kg	4.3
Perfluorodecanesulfonic acid	µg/kg	0.3
Perfluorobutanoic acid	µg/kg	<0.2
Perfluoropentanoic acid	µg/kg	0.2
Perfluorohexanoic acid	µg/kg	<0.5
Perfluoroheptanoic acid	µg/kg	<0.1
Perfluorooctanoic acid PFOA	µg/kg	0.2
Perfluorononanoic acid	µg/kg	0.1
Perfluorodecanoic acid	µg/kg	0.7
Perfluoroundecanoic acid	µg/kg	<0.5
Perfluorododecanoic acid	µg/kg	1
Perfluorotridecanoic acid	µg/kg	<0.5
Perfluorotetradecanoic acid	µg/kg	<5
4:2 FTS	µg/kg	<0.1
6:2 FTS	µg/kg	<0.1
8:2 FTS	µg/kg	<0.2
10:2 FTS	µg/kg	<0.2
Perfluorooctane sulfonamide	µg/kg	<1
N-Methyl perfluorooctane sulfonamide	µg/kg	<1
N-Ethyl perfluorooctanesulfon -amide	µg/kg	<1
N-Me perfluorooctanesulfonamid -oethanol	µg/kg	<1
N-Et perfluorooctanesulfonamid -oethanol	µg/kg	<5
MePerfluorooctanesulf- amid oacetic acid	µg/kg	<1
EtPerfluorooctanesulf- amid oacetic acid	µg/kg	<1
Surrogate $^{13}C_8$ PFOS	%	116
Surrogate $^{13}C_2$ PFOA	%	104
Extracted ISTD $^{13}C_3$ *PFBS*	%	85
Extracted ISTD $^{18}O_2$ *PFHxS*	%	91
Extracted ISTD $^{13}C_4$ *PFOS*	%	85
Extracted ISTD $^{13}C_4$ *PFBA*	%	84

PFAS in Soil Extended		
Our Reference		38969-2
Your Reference	UNITS	SDUP5
Date Sampled		02/08/2023
Type of sample		Soil
Extracted ISTD $^{13}C_3$ PFPeA	%	86
Extracted ISTD $^{13}C_2$ PFHxA	%	88
Extracted ISTD $^{13}C_4$ PFHpA	%	83
Extracted ISTD $^{13}C_4$ PFOA	%	88
Extracted ISTD $^{13}C_5$ PFNA	%	89
Extracted ISTD $^{13}C_2$ PFDA	%	86
Extracted ISTD $^{13}C_2$ PFUnDA	%	81
Extracted ISTD $^{13}C_2$ PFDoDA	%	90
Extracted ISTD $^{13}C_2$ PFTeDA	%	87
Extracted ISTD $^{13}C_2$ 4:2FTS	%	85
Extracted ISTD $^{13}C_2$ 6:2FTS	%	168
Extracted ISTD $^{13}C_2$ 8:2FTS	%	172
Extracted ISTD $^{13}C_8$ FOSA	%	88
Extracted ISTD d_3 N MeFOSA	%	109
Extracted ISTD d_5 NEtFOSA	%	68
Extracted ISTD d_7 N MeFOSE	%	86
Extracted ISTD d_9 N EtFOSE	%	68
Extracted ISTD d_3 N MeFOSAA	%	115
Extracted ISTD d_5 N EtFOSAA	%	138
Total Positive PFHxS & PFOS	µg/kg	4.5
Total Positive PFOS & PFOA	µg/kg	4.5
Total Positive PFAS	µg/kg	7.0

Moisture			
Our Reference		38969-1	38969-2
Your Reference	UNITS	SDUP4	SDUP5
Date Sampled		02/08/2023	02/08/2023
Type of sample		Soil	Soil
Date prepared	-	08/08/2023	08/08/2023
Date analysed	-	09/08/2023	09/08/2023
Moisture	%	12	14

Method ID	Methodology Summary
Inorg-008	Moisture content determined by heating at 105°C for a minimum of 12 hours.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-021/022	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD or GC-MS. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Note, For OCs the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.

Method ID	Methodology Summary
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.
Org-029	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLP/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.4 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			08/08/2023	[NT]	[NT]	[NT]	[NT]	08/08/2023	[NT]
Date analysed	-			09/08/2023	[NT]	[NT]	[NT]	[NT]	09/08/2023	[NT]
vTRH C_6 - C_9	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	74	[NT]
vTRH C_6 - C_{10}	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	74	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	[NT]	[NT]	[NT]	[NT]	69	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	[NT]	[NT]	[NT]	[NT]	74	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	73	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	77	[NT]
o-Xylene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	74	[NT]
Naphthalene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	81	[NT]	[NT]	[NT]	[NT]	68	[NT]

QUALITY CONTROL: TRH Soil C10-C40 NEPM					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			08/08/2023	[NT]	[NT]	[NT]	[NT]	08/08/2023	[NT]
Date analysed	-			10/08/2023	[NT]	[NT]	[NT]	[NT]	10/08/2023	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	88	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	94	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	107	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	88	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	94	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	107	[NT]
Surrogate o-Terphenyl	%		Org-020	106	[NT]	[NT]	[NT]	[NT]	101	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			08/08/2023	[NT]	[NT]	[NT]	[NT]	08/08/2023	[NT]
Date analysed	-			10/08/2023	[NT]	[NT]	[NT]	[NT]	10/08/2023	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	114	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	116	[NT]
Fluorene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	122	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	120	[NT]
Anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	114	[NT]
Pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	118	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	112	[NT]
Benzo(b,j&k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	[NT]	[NT]	[NT]	[NT]	116	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d_{14}	%		Org-022/025	124	[NT]	[NT]	[NT]	[NT]	124	[NT]

QUALITY CONTROL: OCP in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			08/08/2023	[NT]	[NT]	[NT]	[NT]	08/08/2023	[NT]
Date analysed	-			10/08/2023	[NT]	[NT]	[NT]	[NT]	10/08/2023	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	116	[NT]
Hexachlorobenzene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	108	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	114	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	118	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Endrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	120	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 2-chlorophenol-d4	%		Org-022/025	104	[NT]	[NT]	[NT]	[NT]	114	[NT]

QUALITY CONTROL: OP in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			08/08/2023	[NT]	[NT]	[NT]	[NT]	08/08/2023	[NT]
Date analysed	-			10/08/2023	[NT]	[NT]	[NT]	[NT]	10/08/2023	[NT]
Azinphos-methyl	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyrifos	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Diazinon	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	120	[NT]
Dichlorovos	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Fenitrothion	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Malathion	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Coumaphos	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Disulfoton	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fenamiphos	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fenthion	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Methidathion	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Mevinphos	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Methyl Parathion	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Phorate	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Phosalone	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 2-chlorophenol-d4	%		Org-022/025	104	[NT]	[NT]	[NT]	[NT]	114	[NT]

QUALITY CONTROL: PCBs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			08/08/2023	[NT]	[NT]	[NT]	[NT]	08/08/2023	[NT]
Date analysed	-			10/08/2023	[NT]	[NT]	[NT]	[NT]	10/08/2023	[NT]
Aroclor 1016	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Aroclor 1260	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Total PCB (Arochlor 1016-1260)	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 2-fluorobiphenyl	%		Org-022/025	124	[NT]	[NT]	[NT]	[NT]	136	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date digested	-			09/08/2023	[NT]	[NT]	[NT]	[NT]	09/08/2023	[NT]
Date analysed	-			09/08/2023	[NT]	[NT]	[NT]	[NT]	09/08/2023	[NT]
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	[NT]	[NT]	[NT]	[NT]	100	[NT]
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	[NT]	[NT]	[NT]	[NT]	98	[NT]
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Copper	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Lead	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]

QUALITY CONTROL: PFAS in Soil Extended					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Perfluorobutanesulfonic acid	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Perfluoropentanesulfonic acid	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Perfluorohexanesulfonic acid PFHxS	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Perfluoroheptanesulfonic acid	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Perfluorooctanesulfonic acid PFOS	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Perfluorodecanesulfonic acid	µg/kg	0.2	Org-029	<0.2	[NT]	[NT]	[NT]	[NT]	128	[NT]
Perfluorobutanoic acid	µg/kg	0.2	Org-029	<0.2	[NT]	[NT]	[NT]	[NT]	112	[NT]
Perfluoropentanoic acid	µg/kg	0.2	Org-029	<0.2	[NT]	[NT]	[NT]	[NT]	107	[NT]
Perfluorohexanoic acid	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	107	[NT]
Perfluoroheptanoic acid	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	111	[NT]
Perfluorooctanoic acid PFOA	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	115	[NT]
Perfluorononanoic acid	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	115	[NT]
Perfluorodecanoic acid	µg/kg	0.5	Org-029	<0.5	[NT]	[NT]	[NT]	[NT]	124	[NT]
Perfluoroundecanoic acid	µg/kg	0.5	Org-029	<0.5	[NT]	[NT]	[NT]	[NT]	111	[NT]
Perfluorododecanoic acid	µg/kg	0.5	Org-029	<0.5	[NT]	[NT]	[NT]	[NT]	111	[NT]
Perfluorotridecanoic acid	µg/kg	0.5	Org-029	<0.5	[NT]	[NT]	[NT]	[NT]	119	[NT]
Perfluorotetradecanoic acid	µg/kg	5	Org-029	<5	[NT]	[NT]	[NT]	[NT]	116	[NT]
4:2 FTS	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	117	[NT]
6:2 FTS	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
8:2 FTS	µg/kg	0.2	Org-029	<0.2	[NT]	[NT]	[NT]	[NT]	117	[NT]
10:2 FTS	µg/kg	0.2	Org-029	<0.2	[NT]	[NT]	[NT]	[NT]	132	[NT]
Perfluorooctane sulfonamide	µg/kg	1	Org-029	<1	[NT]	[NT]	[NT]	[NT]	110	[NT]
N-Methyl perfluorooctane sulfonamide	µg/kg	1	Org-029	<1	[NT]	[NT]	[NT]	[NT]	136	[NT]
N-Ethyl perfluorooctanesulfon -amide	µg/kg	1	Org-029	<1	[NT]	[NT]	[NT]	[NT]	93	[NT]
N-Me perfluorooctanesulfonamid -oethanol	µg/kg	1	Org-029	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]
N-Et perfluorooctanesulfonamid -oethanol	µg/kg	5	Org-029	<5	[NT]	[NT]	[NT]	[NT]	119	[NT]
MePerfluorooctanesulf- amid oacetic acid	µg/kg	0.2	Org-029	<0.2	[NT]	[NT]	[NT]	[NT]	108	[NT]
EtPerfluorooctanesulf- amid oacetic acid	µg/kg	0.2	Org-029	<0.2	[NT]	[NT]	[NT]	[NT]	108	[NT]
Surrogate $^{13}C_8$ PFOS	%		Org-029	106	[NT]	[NT]	[NT]	[NT]	113	[NT]
Surrogate $^{13}C_2$ PFOA	%		Org-029	103	[NT]	[NT]	[NT]	[NT]	101	[NT]
Extracted ISTD $^{13}C_3$ PFBS	%		Org-029	100	[NT]	[NT]	[NT]	[NT]	84	[NT]

QUALITY CONTROL: PFAS in Soil Extended					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Extracted ISTD $^{18}O_2$ PFHxS	%		Org-029	105	[NT]	[NT]	[NT]	[NT]	81	[NT]
Extracted ISTD $^{13}C_4$ PFOS	%		Org-029	102	[NT]	[NT]	[NT]	[NT]	77	[NT]
Extracted ISTD $^{13}C_4$ PFBA	%		Org-029	108	[NT]	[NT]	[NT]	[NT]	84	[NT]
Extracted ISTD $^{13}C_3$ PFPeA	%		Org-029	107	[NT]	[NT]	[NT]	[NT]	86	[NT]
Extracted ISTD $^{13}C_2$ PFHxA	%		Org-029	102	[NT]	[NT]	[NT]	[NT]	83	[NT]
Extracted ISTD $^{13}C_4$ PFHpA	%		Org-029	99	[NT]	[NT]	[NT]	[NT]	79	[NT]
Extracted ISTD $^{13}C_4$ PFOA	%		Org-029	99	[NT]	[NT]	[NT]	[NT]	79	[NT]
Extracted ISTD $^{13}C_5$ PFNA	%		Org-029	103	[NT]	[NT]	[NT]	[NT]	79	[NT]
Extracted ISTD $^{13}C_2$ PFDA	%		Org-029	99	[NT]	[NT]	[NT]	[NT]	77	[NT]
Extracted ISTD $^{13}C_2$ PFUnDA	%		Org-029	96	[NT]	[NT]	[NT]	[NT]	77	[NT]
Extracted ISTD $^{13}C_2$ PFDoDA	%		Org-029	112	[NT]	[NT]	[NT]	[NT]	80	[NT]
Extracted ISTD $^{13}C_2$ PFTeDA	%		Org-029	126	[NT]	[NT]	[NT]	[NT]	94	[NT]
Extracted ISTD $^{13}C_2$ 4:2FTS	%		Org-029	102	[NT]	[NT]	[NT]	[NT]	80	[NT]
Extracted ISTD $^{13}C_2$ 6:2FTS	%		Org-029	122	[NT]	[NT]	[NT]	[NT]	90	[NT]
Extracted ISTD $^{13}C_2$ 8:2FTS	%		Org-029	83	[NT]	[NT]	[NT]	[NT]	79	[NT]
Extracted ISTD $^{13}C_8$ FOSA	%		Org-029	110	[NT]	[NT]	[NT]	[NT]	85	[NT]
Extracted ISTD d_3 N MeFOSA	%		Org-029	85	[NT]	[NT]	[NT]	[NT]	70	[NT]
Extracted ISTD d_5 NEtFOSA	%		Org-029	108	[NT]	[NT]	[NT]	[NT]	91	[NT]
Extracted ISTD d_7 N MeFOSE	%		Org-029	127	[NT]	[NT]	[NT]	[NT]	98	[NT]
Extracted ISTD d_9 N EtFOSE	%		Org-029	111	[NT]	[NT]	[NT]	[NT]	86	[NT]

QUALITY CONTROL: PFAS in Soil Extended					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Extracted ISTD d_3 *N MeFOSAA*	%		Org-029	107	[NT]	[NT]	[NT]	[NT]	83	[NT]
Extracted ISTD d_5 *N EtFOSAA*	%		Org-029	120	[NT]	[NT]	[NT]	[NT]	85	[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

PFAS:For PFAS Extracted Internal Standards denoted with # or outside the 50-150% acceptance range, the respective target analyte results may be unaffected, in other circumstances the PQL has been raised to accommodate the outlier(s).

PFAS: PQL has been raised for PFHxA, MeFOSAA and EtFOSAA due to sample matrix requiring dilution.

PCB: The Total PCB is calculated by summing 6 of the 7 congeners and multiplying this sum by 5 (according to DIN 51 527). The PCB congener C118 is excluded from the calculation. This method gives a good consistent estimate of the Total PCB present.

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SAMPLE RECEIPT ADVICE

Client Details	
Client	JK Environments
Attention	Vittal Boggaram

Sample Login Details	
Your reference	E343038 Potts Point
Envirolab Reference	38969
Date Sample Received	08/08/2023
Date Instructions Received	08/08/2023
Date Results Expected to be Reported	11/08/2023

Sample Condition	
Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	2 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	12.2C
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments
Nil

Please direct any queries to:

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

Analysis Underway, details on the following page:

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Sample ID	vTRH(C6-C10)/BTEXN in Soil	TRH Soil C10-C40 NEPM	PAHs in Soil	OCP in Soil	OP in Soil	PCBsin Soil	PFAS in Soil Extended	Acid Extractable metalsin soil
SDUP4	✓	✓	✓					✓
SDUP5	✓	✓	✓	✓	✓	✓	✓	✓

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

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

SAMPLE AND CHAIN OF CUSTODY FORM

TO: ENVIROLAB SERVICES PTY LTD 12 ASHLEY STREET CHATSWOOD NSW 2067 P: (02) 99106200 F: (02) 99106201 Attention: Aileen	JKE Job Number: E34303B Date Results Required: STANDARD Page: 2 of 2	**FROM:** JKEnvironments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: Vittal Boggaram vboggaram@jkenvironments.com.au

Location: Potts Point | Sample Preserved in Esky on Ice

Sampler: CR//AD | Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 6aNEPM	Combo 6	PFAS (Routine Level Extended)	Combo 3	Asbestos (detection)	BTEX
31/07/2023	21	SDUP1	-	G, PFAS	-	Duplicate				X		
31/07/2023	22	SDUP2	-	G, PFAS	-	Duplicate						
1/08/2023	23	SDUP3	-	G, PFAS	-	Duplicate		X	X			
1 2/08/2023	~~20~~	SDUP4	-	G, PFAS	-	Duplicate				X	PLEASE SEND TO VIC	
2 2/08/2026	~~20~~	SDUP5	-	G, PFAS	-	Duplicate		X	X		PLEASE SEND TO VIC	
31/07/2023	24	TS-S1	-	V	-	Spike						X
1/08/2023	25	TS-S2	-	V	-	Spike						X
31/07/2023	26	TB-S1	-	G, PFAS	-	Blank			X	X		
1/08/2023	27	TB-S2	-	G, PFAS	-	Blank			X	X		
31/07/2023	28	FR1-SPT	-	G1, H, V, PFAS	-	Rinsate			X	X		
1/08/2023	29	FR2-HA	-	G1, H, PFAS	-	Rinsate			X	X		

#329662
3/8/23 JN

Envirolab Services
25 Research Drive
Croydon South VIC 3136
Ph: (03) 9763 2500
ENVIROLAB
Job No: 38969
Date Received: 8/8/23
Time Received: 12:30pm
Received By: AG
Temp: Cool/Ambient 12.2°C
Cooling: Ice/Icepack
Security: Intact/Broken/None

Remarks (comments/detection limits required):	Sample Containers: G - 250mg Glass Jar A - Ziplock Asbestos Bag P - Plastic Bag G1 - Amber Glass Bottle V - BTEX Vial PFAS - (No liner) H - HN03 wash PVC		
Relinquished By: VB	Date: 3/08/23	Time: 9:45am	Received By:	Date:

Relinquished by : ELS SYD
Sarah P Sal
07/08/23, 1055

Envirolab Services Pty Ltd
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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 329656

Client Details

Client	JK Environments
Attention	Vittal Boggaram
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E34303B, Potts Point**
Number of Samples	6 Soil
Date samples received	03/08/2023
Date completed instructions received	03/08/2023

Analysis Details

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

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

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

Report Details

Date results requested by	10/08/2023
Date of Issue	09/08/2023

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Results Approved By
Jenny He, Senior Chemist

Authorised By
Nancy Zhang, Laboratory Manager

sPOCAS field test						
Our Reference		329656-2	329656-3	329656-4	329656-5	329656-6
Your Reference	UNITS	BH1	BH2	BH2	BH3	BH3
Depth		0.7-1.0	0.15-0.3	0.8-1.0	0.2-0.4	1.0-1.1
Date Sampled		31/07/2023	31/07/2023	31/07/2023	2/08/2023	2/08/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	04/08/2023	04/08/2023	04/08/2023	04/08/2023	04/08/2023
Date analysed	-	04/08/2023	04/08/2023	04/08/2023	04/08/2023	04/08/2023
pH_F (field pH test)	pH Units	6.1	8.2	5.6	8.6	5.7
pH_{FOX} (field peroxide test)	pH Units	6.4	6.5	6.1	6.8	4.1
Reaction Rate*	-	Low reaction	Medium reaction	Low reaction	Medium reaction	Medium reaction

Method ID	Methodology Summary
Inorg-063	pH- measured using pH meter and electrode. Soil is oxidised with Hydrogen Peroxide or extracted with water. To ensure accurate results these tests are recommended to be done in the field as pH may change with time thus these results may not be representative of true field conditions.

QUALITY CONTROL: sPOCAS field test					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			04/08/2023	[NT]	[NT]	[NT]	[NT]	04/08/2023	[NT]
Date analysed	-			04/08/2023	[NT]	[NT]	[NT]	[NT]	04/08/2023	[NT]
pH_F (field pH test)	pH Units		Inorg-063	[NT]	[NT]	[NT]	[NT]	[NT]	99	[NT]
pH_{FOX} (field peroxide test)	pH Units		Inorg-063	[NT]	[NT]	[NT]	[NT]	[NT]	99	[NT]

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

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

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

SAMPLE RECEIPT ADVICE

Client Details	
Client	JK Environments
Attention	Vittal Boggaram

Sample Login Details	
Your reference	E34303B, Potts Point
Envirolab Reference	329656
Date Sample Received	03/08/2023
Date Instructions Received	03/08/2023
Date Results Expected to be Reported	10/08/2023

Sample Condition	
Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	6 Soil
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:

Envirolab Services Pty Ltd
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Sample ID	sPOCAS field test	On Hold
BH1-0.13-0.2		✓
BH1-0.7-1.0	✓	
BH2-0.15-0.3	✓	
BH2-0.8-1.0	✓	
BH3-0.2-0.4	✓	
BH3-1..0-1.1	✓	

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

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

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD 12 ASHLEY STREET CHATSWOOD NSW 2067 P: (02) 99106200 F: (02) 99106201 Attention: Aileen	JKE Job Number: E34303B Date Results Required: STANDARD Page: 1 of 1	JKEnvironments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: Vittal Boggaram Vboggaram@jkenvironments.com.au

Location: Potts Point

Sampler: CR/AD

Sample Preserved in Esky on Ice

Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	Sample Description	SCr extended	pH field test (pHF apHFOX)									
31/07/2023	1	BH1	0.13-0.2	P	Roadbase											
31/07/2023	2	BH1	0.7-1.0	P	Sandstone		X									
31/07/2023	3	BH2	0.15-0.3	P	Sandstone		X									
31/07/2023	4	BH2	0.8-1.0	P	Sandstone		X									
2/08/2023	5	BH3	0.2-0.4	P	Sandstone		X									
2/08/2023	6	BH3	1..0-1.1	P	Sandstone		X									

ENVIROLAB
Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200
Job No: 329656
Date Received: 3/8/23
Time Received: 1630
Received By: ELS SYD
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Remarks (comments/detection limits required):		Sample Containers: G - 250mg Glass Jar A - Ziplock Asbestos Bag P - Plastic Bag	
Relinquished By: VB	Date: 3/08/23	Time: 9.45am	Received By: ELS SYD — Date: 3/8/23

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

CERTIFICATE OF ANALYSIS 329656-A

Client Details

Client	JK Environments
Attention	Vittal Boggaram
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E34303B, Potts Point**
Number of Samples	additional analysis
Date samples received	03/08/2023
Date completed instructions received	29/08/2023

Analysis Details

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

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

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

Report Details

Date results requested by	01/09/2023
Date of Issue	01/09/2023

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

Results Approved By
Priya Samarawickrama, Senior Chemist

Authorised By
Nancy Zhang, Laboratory Manager

Chromium Suite						
Our Reference		329656-A-2	329656-A-3	329656-A-4	329656-A-5	329656-A-6
Your Reference	UNITS	BH1	BH2	BH2	BH3	BH3
Depth		0.7-1.0	0.15-0.3	0.8-1.0	0.2-0.4	1.0-1.1
Date Sampled		31/07/2023	31/07/2023	31/07/2023	2/08/2023	2/08/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	30/08/2023	30/08/2023	30/08/2023	30/08/2023	30/08/2023
Date analysed	-	30/08/2023	30/08/2023	30/08/2023	30/08/2023	30/08/2023
pH_{kcl}	pH units	6.7	6.3	5.3	7.5	4.5
s-TAA pH 6.5	%w/w S	<0.01	<0.01	<0.01	<0.01	0.04
TAA pH 6.5	moles H^+ /t	<5	<5	<5	<5	26
Chromium Reducible Sulfur	%w/w	0.007	0.01	<0.005	0.006	0.01
a-Chromium Reducible Sulfur	moles H^+ /t	4	8	<3	4	7
S_{HCl}	%w/w S	[NT]	[NT]	[NT]	[NT]	[NT]
S_{KCl}	%w/w S	[NT]	[NT]	[NT]	[NT]	[NT]
S_{NAS}	%w/w S	[NT]	[NT]	[NT]	[NT]	[NT]
ANC_{BT}	% $CaCO_3$	1.0	[NT]	[NT]	0.40	[NT]
s-ANC_{BT}	%w/w S	0.34	[NT]	[NT]	0.13	[NT]
s-Net Acidity	%w/w S	<0.005	0.012	0.0060	<0.005	0.052
a-Net Acidity	moles H^+ /t	<5	7.8	<5	<5	32
Liming rate	kg $CaCO_3$ /t	<0.75	<0.75	<0.75	<0.75	2
a-Net Acidity without ANCE	moles H^+ /t	<5	7.8	<5	<5	32
Liming rate without ANCE	kg $CaCO_3$ /t	<0.75	<0.75	<0.75	<0.75	2.4
s-Net Acidity without ANCE	%w/w S	0.0070	0.012	0.0060	0.0060	0.052

Method ID	Methodology Summary
Inorg-068	Chromium Reducible Sulfur - Hydrogen Sulfide is quantified by iodometric titration after distillation to determine potential acidity. Net acidity including ANC has a safety factor of 1.5 applied. Neutralising value (NV) of 100% is assumed for liming rate. The recommendation that the SHCL concentration be multiplied by a factor of 2 to ensure retained acidity is not underestimated, has not been applied in the SHCL result. However, it has been applied in the SNAS calculation: SNAS % = (SHCL-SKCL)x2

QUALITY CONTROL: Chromium Suite					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			30/08/2023	[NT]	[NT]	[NT]	[NT]	30/08/2023	[NT]
Date analysed	-			30/08/2023	[NT]	[NT]	[NT]	[NT]	30/08/2023	[NT]
pH $_{kcl}$	pH units		Inorg-068	[NT]	[NT]	[NT]	[NT]	[NT]	95	[NT]
s-TAA pH 6.5	%w/w S	0.01	Inorg-068	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
TAA pH 6.5	moles H^+/t	5	Inorg-068	<5	[NT]	[NT]	[NT]	[NT]	93	[NT]
Chromium Reducible Sulfur	%w/w	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	97	[NT]
a-Chromium Reducible Sulfur	moles H^+/t	3	Inorg-068	<3	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
S_{HCl}	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
S_{KCl}	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
S_{NAS}	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
ANC_{BT}	% $CaCO_3$	0.05	Inorg-068	<0.05	[NT]	[NT]	[NT]	[NT]	100	[NT]
s-ANC_{BT}	%w/w S	0.05	Inorg-068	<0.05	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
s-Net Acidity	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
a-Net Acidity	moles H^+/t	5	Inorg-068	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Liming rate	kg $CaCO_3$/t	0.75	Inorg-068	<0.75	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
a-Net Acidity without ANCE	moles H^+/t	5	Inorg-068	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Liming rate without ANCE	kg $CaCO_3$/t	0.75	Inorg-068	<0.75	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
s-Net Acidity without ANCE	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

QUALITY CONTROL: Chromium Suite					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date prepared	-			[NT]	[NT]	[NT]	[NT]	[NT]	30/08/2023	[NT]
Date analysed	-			[NT]	[NT]	[NT]	[NT]	[NT]	30/08/2023	[NT]
pH $_{kcl}$	pH units		Inorg-068	[NT]	[NT]	[NT]	[NT]	[NT]	96	[NT]
TAA pH 6.5	moles H^+/t	5	Inorg-068	[NT]	[NT]	[NT]	[NT]	[NT]	97	[NT]
Chromium Reducible Sulfur	%w/w	0.005	Inorg-068	[NT]	[NT]	[NT]	[NT]	[NT]	101	[NT]
ANC_{BT}	% $CaCO_3$	0.05	Inorg-068	[NT]	[NT]	[NT]	[NT]	[NT]	100	[NT]

Result Definitions

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

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

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SAMPLE RECEIPT ADVICE

Client Details	
Client	JK Environments
Attention	Vittal Boggaram

Sample Login Details	
Your reference	E34303B, Potts Point
Envirolab Reference	329656-A
Date Sample Received	03/08/2023
Date Instructions Received	29/08/2023
Date Results Expected to be Reported	01/09/2023

Sample Condition	
Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	additional analysis
Turnaround Time Requested	3 days
Temperature on Receipt (°C)	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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ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200   fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	Chromium Suite	On Hold
BH1-0.13-0.2		✓
BH1-0.7-1.0	✓	
BH2-0.15-0.3	✓	
BH2-0.8-1.0	✓	
BH3-0.2-0.4	✓	
BH3-1.0-1.1	✓	

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

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

Ming To

From: Aileen Hie
Sent: Tuesday, 29 August 2023 11:20 AM
To: Vittal Boggaram; Nick Sarlamis
Cc: Ming To
Subject: RE: Results for Registration 329656 E34303B, Potts Point

Ref: 329656-A
TAT: 3 day.
Due: ~~04~~ 01/09/2023

HI Vittal

No problem, we will get this logged in.

Kind Regards,

Aileen Hie | Customer Service Supervisor | Envirolab Services
(Monday to Friday 10am to 6pm)

Great Science. Great Service.

12 Ashley Street Chatswood NSW 2067
T 612 9910 6200
E AHie@envirolab.com.au | W www.envirolab.com.au

Follow us on: LinkedIn | Facebook | Twitter

Samples will be analysed per our T&C's.

From: Vittal Boggaram <VBoggaram@jkenvironments.com.au>
Sent: Tuesday, August 29, 2023 10:51 AM
To: Nick Sarlamis <NSarlamis@envirolab.com.au>
Cc: Aileen Hie <AHie@envirolab.com.au>
Subject: RE: Results for Registration 329656 E34303B, Potts Point

Hi Nick,

I refer to the following report. Can you please schedule **Chromium Reducible Sulfur (SCR)** testing on the following samples on a **three day t/a** thanks:

BH1 2	0.7-1.0
BH2 3	0.15-0.3
BH2 4	0.8-1.0
BH3 5	0.2-0.4
BH3 6	1.0-1.1

Regards
Vittal Boggaram
Principal Associate | Environmental Scientist

T: +612 9888 5000
D: 0451 110 352
E: VBoggaram@jkenvironments.com.au
www.jkenvironments.com.au

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

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CERTIFICATE OF ANALYSIS 329662

Client Details

Client	JK Environments
Attention	Vittal Boggaram
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E34303B, Potts Point**
Number of Samples	27 Soil, 2 Water
Date samples received	03/08/2023
Date completed instructions received	03/08/2023

Analysis Details

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

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

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

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

Report Details

Date results requested by	11/08/2023
Date of Issue	11/08/2023
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Asbestos Approved By
Analysed by Asbestos Approved Analyst: Anthony Clark
Authorised by Asbestos Approved Signatory: Lucy Zhu, Nyovan Moonean

Results Approved By
Alexander Mitchell Maclean, Senior Chemist
Dragana Tomas, Senior Chemist
Hannah Nguyen, Metals Supervisor
Loren Bardwell, Development Chemist
Nyovan Moonean, Asbestos Approved Identifier/Counter
Steven Luong, Senior Chemist

Authorised By
Nancy Zhang, Laboratory Manager

PFAS in Soils Extended						
Our Reference		329662-2	329662-4	329662-7	329662-11	329662-13
Your Reference	UNITS	BH1	BH2	TP5	BH6	BH7
Depth		0.2-0.3	0.15-0.3	0.1-0.2	0.1-0.3	0-0.1
Date Sampled		31/07/2023	31/07/2023	1/08/2023	1/08/2023	1/08/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	04/08/2023	04/08/2023	04/08/2023	04/08/2023	04/08/2023
Date analysed	-	04/08/2023	04/08/2023	04/08/2023	04/08/2023	04/08/2023
Perfluorobutanesulfonic acid	µg/kg	<0.1	<0.1	<0.1	<0.1	0.1
Perfluoropentanesulfonic acid	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorohexanesulfonic acid - PFHxS	µg/kg	<0.1	<0.1	<0.1	<0.1	0.2
Perfluoroheptanesulfonic acid	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorooctanesulfonic acid PFOS	µg/kg	<0.1	<0.1	0.8	<0.1	14
Perfluorodecanesulfonic acid	µg/kg	<0.2	<0.2	<0.2	<0.2	2
Perfluorobutanoic acid	µg/kg	<0.2	<0.2	<0.2	<0.2	0.3
Perfluoropentanoic acid	µg/kg	<0.2	<0.2	<0.2	<0.2	0.8
Perfluorohexanoic acid	µg/kg	<0.1	<0.1	0.2	<0.1	0.5
Perfluoroheptanoic acid	µg/kg	<0.1	<0.1	<0.1	<0.1	0.3
Perfluorooctanoic acid PFOA	µg/kg	<0.1	<0.1	0.3	<0.1	0.9
Perfluorononanoic acid	µg/kg	<0.1	<0.1	<0.1	<0.1	0.4
Perfluorodecanoic acid	µg/kg	<0.5	<0.5	0.6	<0.5	2
Perfluoroundecanoic acid	µg/kg	<0.5	<0.5	<0.5	<0.5	0.8
Perfluorododecanoic acid	µg/kg	<0.5	<0.5	<0.5	<0.5	1
Perfluorotridecanoic acid	µg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Perfluorotetradecanoic acid	µg/kg	<5	<5	<5	<5	<5
4:2 FTS	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
6:2 FTS	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
8:2 FTS	µg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
10:2 FTS	µg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Perfluorooctane sulfonamide	µg/kg	<1	<1	<1	<1	<1
N-Methyl perfluorooctane sulfonamide	µg/kg	<1	<1	<1	<1	<1
N-Ethyl perfluorooctanesulfon amide	µg/kg	<1	<1	<1	<1	<1
N-Me perfluorooctanesulfonamid oethanol	µg/kg	<1	<1	<1	<1	<1
N-Et perfluorooctanesulfonamid oethanol	µg/kg	<5	<5	<5	<5	<5
MePerfluorooctanesulf- amid oacetic acid	µg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
EtPerfluorooctanesulf amid oacetic acid	µg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Surrogate $^{13}C_8$ *PFOS*	%	106	100	100	101	104
Surrogate $^{13}C_2$ *PFOA*	%	88	94	89	93	74
Extracted ISTD $^{13}C_3$ *PFBS*	%	87	90	88	82	82
Extracted ISTD $^{18}O_2$ *PFHxS*	%	88	88	85	89	81
Extracted ISTD $^{13}C_4$ *PFOS*	%	101	98	100	100	94

PFAS in Soils Extended						
Our Reference		329662-2	329662-4	329662-7	329662-11	329662-13
Your Reference	UNITS	BH1	BH2	TP5	BH6	BH7
Depth		0.2-0.3	0.15-0.3	0.1-0.2	0.1-0.3	0-0.1
Date Sampled		31/07/2023	31/07/2023	1/08/2023	1/08/2023	1/08/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Extracted ISTD $^{13}C_4$ *PFBA*	%	102	100	99	99	81
Extracted ISTD $^{13}C_3$ *PFPeA*	%	84	88	91	88	73
Extracted ISTD $^{13}C_2$ *PFHxA*	%	106	98	103	99	94
Extracted ISTD $^{13}C_4$ *PFHpA*	%	101	97	107	101	98
Extracted ISTD $^{13}C_4$ *PFOA*	%	110	100	108	104	115
Extracted ISTD $^{13}C_5$ *PFNA*	%	101	95	95	95	85
Extracted ISTD $^{13}C_2$ *PFDA*	%	95	94	99	96	100
Extracted ISTD $^{13}C_2$ *PFUnDA*	%	105	106	106	108	89
Extracted ISTD $^{13}C_2$ *PFDoDA*	%	107	100	120	105	87
Extracted ISTD $^{13}C_2$ *PFTeDA*	%	109	100	100	104	58
Extracted ISTD $^{13}C_2$ *4:2FTS*	%	105	101	187	104	148
Extracted ISTD $^{13}C_2$ *6:2FTS*	%	99	97	125	100	152
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	111	105	188	111	157
Extracted ISTD $^{13}C_8$ *FOSA*	%	107	105	98	105	54
Extracted ISTD d_3 *N MeFOSA*	%	100	103	94	99	60
Extracted ISTD d_5 *N EtFOSA*	%	106	107	100	102	75
Extracted ISTD d_7 *N MeFOSE*	%	95	93	87	95	59
Extracted ISTD d_9 *N EtFOSE*	%	102	101	101	100	82
Extracted ISTD d_3 *N MeFOSAA*	%	106	100	126	103	119
Extracted ISTD d_5 *N EtFOSAA*	%	122	113	143	116	95
Total Positive PFHxS & PFOS	μg/kg	<0.1	<0.1	0.8	<0.1	14
Total Positive PFOS & PFOA	μg/kg	<0.1	<0.1	1.1	<0.1	15
Total Positive PFAS	μg/kg	<0.1	<0.1	1.9	<0.1	23

PFAS in Soils Extended						
Our Reference		329662-15	329662-17	329662-19	329662-23	329662-26
Your Reference	UNITS	BH8	BH9	TP10	SDUP3	TB-S1
Depth		0.1-0.2	0.12-0.2	0-0.1	-	-
Date Sampled		1/08/2023	1/08/2023	2/08/2023	1/08/2023	31/07/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	04/08/2023	04/08/2023	04/08/2023	04/08/2023	04/08/2023
Date analysed	-	04/08/2023	04/08/2023	04/08/2023	04/08/2023	04/08/2023
Perfluorobutanesulfonic acid	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanesulfonic acid	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorohexanesulfonic acid - PFHxS	µg/kg	<0.1	<0.1	0.4	0.3	<0.1
Perfluoroheptanesulfonic acid	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorooctanesulfonic acid PFOS	µg/kg	1	0.3	6.7	14	<0.1
Perfluorodecanesulfonic acid	µg/kg	<0.2	<0.2	0.2	2	<0.2
Perfluorobutanoic acid	µg/kg	<0.2	<0.2	<0.2	0.4	<0.2
Perfluoropentanoic acid	µg/kg	<0.2	<0.2	0.3	0.9	<0.2
Perfluorohexanoic acid	µg/kg	<0.1	<0.1	0.1	0.5	<0.1
Perfluoroheptanoic acid	µg/kg	<0.1	<0.1	<0.1	0.4	<0.1
Perfluorooctanoic acid PFOA	µg/kg	<0.1	<0.1	0.3	1.0	<0.1
Perfluorononanoic acid	µg/kg	<0.1	<0.1	0.2	0.4	<0.1
Perfluorodecanoic acid	µg/kg	<0.5	<0.5	0.8	2	<0.5
Perfluoroundecanoic acid	µg/kg	<0.5	<0.5	<0.5	0.7	<0.5
Perfluorododecanoic acid	µg/kg	<0.5	<0.5	1	1	<0.5
Perfluorotridecanoic acid	µg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Perfluorotetradecanoic acid	µg/kg	<5	<5	<5	<5	<5
4:2 FTS	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
6:2 FTS	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
8:2 FTS	µg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
10:2 FTS	µg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Perfluorooctane sulfonamide	µg/kg	<1	<1	<1	<1	<1
N-Methyl perfluorooctane sulfonamide	µg/kg	<1	<1	<1	<1	<1
N-Ethyl perfluorooctanesulfon amide	µg/kg	<1	<1	<1	<1	<1
N-Me perfluorooctanesulfonamid oethanol	µg/kg	<1	<1	<1	<1	<1
N-Et perfluorooctanesulfonamid oethanol	µg/kg	<5	<5	<5	<5	<5
MePerfluorooctanesulf- amid oacetic acid	µg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
EtPerfluorooctanesulf amid oacetic acid	µg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Surrogate $^{13}C_8$ *PFOS*	%	99	104	104	94	106
Surrogate $^{13}C_2$ *PFOA*	%	84	90	81	72	79
Extracted ISTD $^{13}C_3$ *PFBS*	%	78	81	90	77	82
Extracted ISTD $^{18}O_2$ *PFHxS*	%	83	88	88	84	87
Extracted ISTD $^{13}C_4$ *PFOS*	%	97	100	100	102	101

PFAS in Soils Extended						
Our Reference		329662-15	329662-17	329662-19	329662-23	329662-26
Your Reference	UNITS	BH8	BH9	TP10	SDUP3	TB-S1
Depth		0.1-0.2	0.12-0.2	0-0.1	-	-
Date Sampled		1/08/2023	1/08/2023	2/08/2023	1/08/2023	31/07/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Extracted ISTD $^{13}C_4$ *PFBA*	%	90	96	103	82	98
Extracted ISTD $^{13}C_3$ *PFPeA*	%	71	83	89	67	77
Extracted ISTD $^{13}C_2$ *PFHxA*	%	97	100	105	94	106
Extracted ISTD $^{13}C_4$ *PFHpA*	%	100	98	109	103	107
Extracted ISTD $^{13}C_4$ *PFOA*	%	105	106	121	115	112
Extracted ISTD $^{13}C_5$ *PFNA*	%	91	96	88	88	95
Extracted ISTD $^{13}C_2$ *PFDA*	%	100	98	105	110	93
Extracted ISTD $^{13}C_2$ *PFUnDA*	%	100	103	117	95	82
Extracted ISTD $^{13}C_2$ *PFDoDA*	%	115	120	123	104	71
Extracted ISTD $^{13}C_2$ *PFTeDA*	%	105	105	84	64	30
Extracted ISTD $^{13}C_2$ *4:2FTS*	%	107	103	141	143	112
Extracted ISTD $^{13}C_2$ *6:2FTS*	%	98	104	159	141	97
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	105	111	171	143	102
Extracted ISTD $^{13}C_8$ *FOSA*	%	99	100	77	57	105
Extracted ISTD d_3 *N MeFOSA*	%	95	99	74	65	104
Extracted ISTD d_5 *N EtFOSA*	%	101	106	83	84	116
Extracted ISTD d_7 *N MeFOSE*	%	88	90	68	68	97
Extracted ISTD d_9 *N EtFOSE*	%	101	100	78	87	111
Extracted ISTD d_3 *N MeFOSAA*	%	121	108	148	133	60
Extracted ISTD d_5 *N EtFOSAA*	%	121	111	141	92	40
Total Positive PFHxS & PFOS	µg/kg	1	0.3	7.1	15	<0.1
Total Positive PFOS & PFOA	µg/kg	1	0.3	7.0	15	<0.1
Total Positive PFAS	µg/kg	1	0.3	10	24	<0.1

PFAS in Soils Extended		
Our Reference		329662-27
Your Reference	UNITS	TB-S2
Depth		-
Date Sampled		1/08/2023
Type of sample		Soil
Date prepared	-	04/08/2023
Date analysed	-	04/08/2023
Perfluorobutanesulfonic acid	µg/kg	<0.1
Perfluoropentanesulfonic acid	µg/kg	<0.1
Perfluorohexanesulfonic acid - PFHxS	µg/kg	<0.1
Perfluoroheptanesulfonic acid	µg/kg	<0.1
Perfluorooctanesulfonic acid PFOS	µg/kg	<0.1
Perfluorodecanesulfonic acid	µg/kg	<0.2
Perfluorobutanoic acid	µg/kg	<0.2
Perfluoropentanoic acid	µg/kg	<0.2
Perfluorohexanoic acid	µg/kg	<0.1
Perfluoroheptanoic acid	µg/kg	<0.1
Perfluorooctanoic acid PFOA	µg/kg	<0.1
Perfluorononanoic acid	µg/kg	<0.1
Perfluorodecanoic acid	µg/kg	<0.5
Perfluoroundecanoic acid	µg/kg	<0.5
Perfluorododecanoic acid	µg/kg	<0.5
Perfluorotridecanoic acid	µg/kg	<0.5
Perfluorotetradecanoic acid	µg/kg	<5
4:2 FTS	µg/kg	<0.1
6:2 FTS	µg/kg	<0.1
8:2 FTS	µg/kg	<0.2
10:2 FTS	µg/kg	<0.2
Perfluorooctane sulfonamide	µg/kg	<1
N-Methyl perfluorooctane sulfonamide	µg/kg	<1
N-Ethyl perfluorooctanesulfon amide	µg/kg	<1
N-Me perfluorooctanesulfonamid oethanol	µg/kg	<1
N-Et perfluorooctanesulfonamid oethanol	µg/kg	<5
MePerfluorooctanesulf- amid oacetic acid	µg/kg	<0.2
EtPerfluorooctanesulf amid oacetic acid	µg/kg	<0.2
Surrogate $^{13}C_8$ *PFOS*	%	101
Surrogate $^{13}C_2$ *PFOA*	%	93
Extracted ISTD $^{13}C_3$ *PFBS*	%	89
Extracted ISTD $^{18}O_2$ *PFHxS*	%	90
Extracted ISTD $^{13}C_4$ *PFOS*	%	104

PFAS in Soils Extended		
Our Reference		329662-27
Your Reference	UNITS	TB-S2
Depth		-
Date Sampled		1/08/2023
Type of sample		Soil
Extracted ISTD $^{13}C_4$ *PFBA*	%	102
Extracted ISTD $^{13}C_3$ *PFPeA*	%	87
Extracted ISTD $^{13}C_2$ *PFHxA*	%	103
Extracted ISTD $^{13}C_4$ *PFHpA*	%	105
Extracted ISTD $^{13}C_4$ *PFOA*	%	109
Extracted ISTD $^{13}C_5$ *PFNA*	%	96
Extracted ISTD $^{13}C_2$ *PFDA*	%	96
Extracted ISTD $^{13}C_2$ *PFUnDA*	%	101
Extracted ISTD $^{13}C_2$ *PFDoDA*	%	96
Extracted ISTD $^{13}C_2$ *PFTeDA*	%	61
Extracted ISTD $^{13}C_2$ *4:2FTS*	%	109
Extracted ISTD $^{13}C_2$ *6:2FTS*	%	102
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	102
Extracted ISTD $^{13}C_8$ *FOSA*	%	109
Extracted ISTD d_3 *N MeFOSA*	%	103
Extracted ISTD d_5 *N EtFOSA*	%	108
Extracted ISTD d_7 *N MeFOSE*	%	97
Extracted ISTD d_9 *N EtFOSE*	%	110
Extracted ISTD d_3 *N MeFOSAA*	%	91
Extracted ISTD d_5 *N EtFOSAA*	%	96
Total Positive PFHxS & PFOS	µg/kg	<0.1
Total Positive PFOS & PFOA	µg/kg	<0.1
Total Positive PFAS	µg/kg	<0.1

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		329662-2	329662-3	329662-4	329662-6	329662-7
Your Reference	UNITS	BH1	BH1	BH2	BH3	TP5
Depth		0.2-0.3	0.7-1.0	0.15-0.3	0.2-0.4	0.1-0.2
Date Sampled		31/07/2023	31/07/2023	31/07/2023	2/08/2023	1/08/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/08/2023	04/08/2023	04/08/2023	04/08/2023	04/08/2023
Date analysed	-	07/08/2023	07/08/2023	07/08/2023	07/08/2023	07/08/2023
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	101	98	97	97	97

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		329662-9	329662-11	329662-13	329662-14	329662-15
Your Reference	UNITS	TP5	BH6	BH7	BH7	BH8
Depth		0.4-0.5	0.1-0.3	0-0.1	0.3-0.4	0.1-0.2
Date Sampled		1/08/2023	1/08/2023	1/08/2023	1/08/2023	1/08/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/08/2023	04/08/2023	04/08/2023	04/08/2023	04/08/2023
Date analysed	-	07/08/2023	07/08/2023	07/08/2023	07/08/2023	07/08/2023
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	95	96	94	96	95

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		329662-17	329662-18	329662-19	329662-21	329662-23
Your Reference	UNITS	BH9	BH9	TP10	SDUP1	SDUP3
Depth		0.12-0.2	0.2-0.35	0-0.1	-	-
Date Sampled		1/08/2023	1/08/2023	2/08/2023	31/07/2023	1/08/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/08/2023	04/08/2023	04/08/2023	04/08/2023	04/08/2023
Date analysed	-	07/08/2023	07/08/2023	07/08/2023	07/08/2023	07/08/2023
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	95	97	93	97	95

vTRH(C6-C10)/BTEXN in Soil					
Our Reference		329662-24	329662-25	329662-26	329662-27
Your Reference	UNITS	TS-S1	TS-S2	TB-S1	TB-S2
Depth		-	-	-	-
Date Sampled		31/07/2023	1/08/2023	31/07/2023	1/08/2023
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	04/08/2023	04/08/2023	04/08/2023	04/08/2023
Date analysed	-	07/08/2023	07/08/2023	07/08/2023	07/08/2023
TRH C_6 - C_9	mg/kg	[NA]	[NA]	<25	<25
TRH C_6 - C_{10}	mg/kg	[NA]	[NA]	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	[NA]	[NA]	<25	<25
Benzene	mg/kg	101%	97%	<0.2	<0.2
Toluene	mg/kg	100%	96%	<0.5	<0.5
Ethylbenzene	mg/kg	100%	96%	<1	<1
m+p-xylene	mg/kg	100%	97%	<2	<2
o-Xylene	mg/kg	100%	97%	<1	<1
Naphthalene	mg/kg	[NA]	[NA]	<1	<1
Total +ve Xylenes	mg/kg	[NA]	[NA]	<1	<1
Surrogate aaa-Trifluorotoluene	%	103	96	70	100

svTRH (C10-C40) in Soil						
Our Reference		329662-2	329662-3	329662-4	329662-6	329662-7
Your Reference	UNITS	BH1	BH1	BH2	BH3	TP5
Depth		0.2-0.3	0.7-1.0	0.15-0.3	0.2-0.4	0.1-0.2
Date Sampled		31/07/2023	31/07/2023	31/07/2023	2/08/2023	1/08/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/08/2023	04/08/2023	04/08/2023	04/08/2023	04/08/2023
Date analysed	-	05/08/2023	05/08/2023	05/08/2023	05/08/2023	05/08/2023
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	90	98	81	79	80

svTRH (C10-C40) in Soil						
Our Reference		329662-9	329662-11	329662-13	329662-14	329662-15
Your Reference	UNITS	TP5	BH6	BH7	BH7	BH8
Depth		0.4-0.5	0.1-0.3	0-0.1	0.3-0.4	0.1-0.2
Date Sampled		1/08/2023	1/08/2023	1/08/2023	1/08/2023	1/08/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/08/2023	04/08/2023	04/08/2023	04/08/2023	04/08/2023
Date analysed	-	05/08/2023	05/08/2023	06/08/2023	06/08/2023	05/08/2023
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	140	440	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	170	240	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	310	680	<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	260	590	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	110	160	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	360	750	<50
Surrogate o-Terphenyl	%	82	83	89	106	84

svTRH (C10-C40) in Soil						
Our Reference		329662-17	329662-18	329662-19	329662-21	329662-23
Your Reference	UNITS	BH9	BH9	TP10	SDUP1	SDUP3
Depth		0.12-0.2	0.2-0.35	0-0.1	-	-
Date Sampled		1/08/2023	1/08/2023	2/08/2023	31/07/2023	1/08/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/08/2023	04/08/2023	04/08/2023	04/08/2023	04/08/2023
Date analysed	-	05/08/2023	05/08/2023	06/08/2023	05/08/2023	06/08/2023
TRH C_{10} - C_{14}	mg/kg	<50	<50	92	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	1,200	<100	140
TRH C_{29} - C_{36}	mg/kg	<100	<100	2,200	<100	210
Total +ve TRH (C10-C36)	mg/kg	<50	<50	3,500	<50	350
TRH >C_{10} -C_{16}	mg/kg	<50	<50	97	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	97	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	2,800	<100	290
TRH >C_{34} -C_{40}	mg/kg	<100	<100	1,300	<100	130
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	4,200	<50	420
Surrogate o-Terphenyl	%	86	83	122	85	85

svTRH (C10-C40) in Soil			
Our Reference		329662-26	329662-27
Your Reference	UNITS	TB-S1	TB-S2
Depth		-	-
Date Sampled		31/07/2023	1/08/2023
Type of sample		Soil	Soil
Date extracted	-	04/08/2023	04/08/2023
Date analysed	-	06/08/2023	05/08/2023
TRH C_{10} - C_{14}	mg/kg	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50
Surrogate o-Terphenyl	%	87	84

PAHs in Soil						
Our Reference		329662-2	329662-3	329662-4	329662-6	329662-7
Your Reference	UNITS	BH1	BH1	BH2	BH3	TP5
Depth		0.2-0.3	0.7-1.0	0.15-0.3	0.2-0.4	0.1-0.2
Date Sampled		31/07/2023	31/07/2023	31/07/2023	2/08/2023	1/08/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/08/2023	04/08/2023	04/08/2023	04/08/2023	04/08/2023
Date analysed	-	07/08/2023	09/08/2023	07/08/2023	07/08/2023	07/08/2023
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	0.08
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	0.53
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	%	80	94	80	76	80

PAHs in Soil						
Our Reference		329662-9	329662-11	329662-13	329662-14	329662-15
Your Reference	UNITS	TP5	BH6	BH7	BH7	BH8
Depth		0.4-0.5	0.1-0.3	0-0.1	0.3-0.4	0.1-0.2
Date Sampled		1/08/2023	1/08/2023	1/08/2023	1/08/2023	1/08/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/08/2023	04/08/2023	04/08/2023	04/08/2023	04/08/2023
Date analysed	-	09/08/2023	07/08/2023	07/08/2023	09/08/2023	07/08/2023
Naphthalene	mg/kg	<0.1	<0.1	<0.1	0.2	<0.1
Acenaphthylene	mg/kg	<0.1	0.1	0.1	0.7	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	0.3	<0.1
Phenanthrene	mg/kg	<0.1	0.6	0.8	13	0.3
Anthracene	mg/kg	<0.1	0.2	0.2	2.6	<0.1
Fluoranthene	mg/kg	<0.1	0.9	1.7	42	0.4
Pyrene	mg/kg	<0.1	0.8	1.5	40	0.5
Benzo(a)anthracene	mg/kg	<0.1	0.4	0.8	16	0.2
Chrysene	mg/kg	<0.1	0.3	0.6	15	0.2
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	0.5	1	26	0.3
Benzo(a)pyrene	mg/kg	<0.05	0.3	0.70	20	0.2
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	0.1	0.3	7.5	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	1.7	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	0.2	0.5	8.7	<0.1
Total +ve PAH's	mg/kg	<0.05	4.6	8.3	190	2.2
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	0.9	26	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	0.5	1	26	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	0.6	1.0	26	<0.5
Surrogate p-Terphenyl-d14	%	94	77	79	102	71

PAHs in Soil						
Our Reference		329662-17	329662-18	329662-19	329662-21	329662-23
Your Reference	UNITS	BH9	BH9	TP10	SDUP1	SDUP3
Depth		0.12-0.2	0.2-0.35	0-0.1	-	-
Date Sampled		1/08/2023	1/08/2023	2/08/2023	31/07/2023	1/08/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/08/2023	04/08/2023	04/08/2023	04/08/2023	04/08/2023
Date analysed	-	07/08/2023	09/08/2023	07/08/2023	09/08/2023	09/08/2023
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	0.3	<0.1	<0.1
Pyrene	mg/kg	0.1	<0.1	0.3	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	0.3	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.09	<0.05	0.2	<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	0.2	<0.1	<0.1
Total +ve PAH's	mg/kg	0.4	<0.05	1.8	<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	%	74	92	77	96	99

PAHs in Soil			
Our Reference		329662-26	329662-27
Your Reference	UNITS	TB-S1	TB-S2
Depth		-	-
Date Sampled		31/07/2023	1/08/2023
Type of sample		Soil	Soil
Date extracted	-	04/08/2023	04/08/2023
Date analysed	-	09/08/2023	09/08/2023
Naphthalene	mg/kg	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	113	94

Organochlorine Pesticides in soil						
Our Reference		329662-2	329662-4	329662-6	329662-7	329662-11
Your Reference	UNITS	BH1	BH2	BH3	TP5	BH6
Depth		0.2-0.3	0.15-0.3	0.2-0.4	0.1-0.2	0.1-0.3
Date Sampled		31/07/2023	31/07/2023	2/08/2023	1/08/2023	1/08/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/08/2023	04/08/2023	04/08/2023	04/08/2023	04/08/2023
Date analysed	-	07/08/2023	07/08/2023	07/08/2023	07/08/2023	07/08/2023
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
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 TCMX	%	111	99	100	100	108

Organochlorine Pesticides in soil						
Our Reference		329662-13	329662-15	329662-17	329662-19	329662-23
Your Reference	UNITS	BH7	BH8	BH9	TP10	SDUP3
Depth		0-0.1	0.1-0.2	0.12-0.2	0-0.1	-
Date Sampled		1/08/2023	1/08/2023	1/08/2023	2/08/2023	1/08/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/08/2023	04/08/2023	04/08/2023	04/08/2023	04/08/2023
Date analysed	-	07/08/2023	07/08/2023	07/08/2023	07/08/2023	07/08/2023
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
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 TCMX	%	101	107	109	99	103

Organophosphorus Pesticides in Soil						
Our Reference		329662-2	329662-4	329662-6	329662-7	329662-11
Your Reference	UNITS	BH1	BH2	BH3	TP5	BH6
Depth		0.2-0.3	0.15-0.3	0.2-0.4	0.1-0.2	0.1-0.3
Date Sampled		31/07/2023	31/07/2023	2/08/2023	1/08/2023	1/08/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/08/2023	04/08/2023	04/08/2023	04/08/2023	04/08/2023
Date analysed	-	07/08/2023	07/08/2023	07/08/2023	07/08/2023	07/08/2023
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 TCMX	%	111	99	100	100	108

Organophosphorus Pesticides in Soil						
Our Reference		329662-13	329662-15	329662-17	329662-19	329662-23
Your Reference	UNITS	BH7	BH8	BH9	TP10	SDUP3
Depth		0-0.1	0.1-0.2	0.12-0.2	0-0.1	-
Date Sampled		1/08/2023	1/08/2023	1/08/2023	2/08/2023	1/08/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/08/2023	04/08/2023	04/08/2023	04/08/2023	04/08/2023
Date analysed	-	07/08/2023	07/08/2023	07/08/2023	07/08/2023	07/08/2023
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 TCMX	%	101	107	109	99	103

PCBs in Soil						
Our Reference		329662-2	329662-4	329662-6	329662-7	329662-11
Your Reference	UNITS	BH1	BH2	BH3	TP5	BH6
Depth		0.2-0.3	0.15-0.3	0.2-0.4	0.1-0.2	0.1-0.3
Date Sampled		31/07/2023	31/07/2023	2/08/2023	1/08/2023	1/08/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/08/2023	04/08/2023	04/08/2023	04/08/2023	04/08/2023
Date analysed	-	07/08/2023	07/08/2023	07/08/2023	07/08/2023	07/08/2023
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	111	99	100	100	108

PCBs in Soil						
Our Reference		329662-13	329662-15	329662-17	329662-19	329662-23
Your Reference	UNITS	BH7	BH8	BH9	TP10	SDUP3
Depth		0-0.1	0.1-0.2	0.12-0.2	0-0.1	-
Date Sampled		1/08/2023	1/08/2023	1/08/2023	2/08/2023	1/08/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/08/2023	04/08/2023	04/08/2023	04/08/2023	04/08/2023
Date analysed	-	07/08/2023	07/08/2023	07/08/2023	07/08/2023	09/08/2023
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	0.4	<0.1	0.6	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	0.4	<0.1	0.6	<0.1
Surrogate TCMX	%	101	107	109	99	114

Acid Extractable metals in soil						
Our Reference		329662-2	329662-3	329662-4	329662-6	329662-7
Your Reference	UNITS	BH1	BH1	BH2	BH3	TP5
Depth		0.2-0.3	0.7-1.0	0.15-0.3	0.2-0.4	0.1-0.2
Date Sampled		31/07/2023	31/07/2023	31/07/2023	2/08/2023	1/08/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	04/08/2023	04/08/2023	04/08/2023	04/08/2023	04/08/2023
Date analysed	-	08/08/2023	08/08/2023	08/08/2023	08/08/2023	08/08/2023
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	<1	1	4	4	13
Copper	mg/kg	<1	<1	2	6	70
Lead	mg/kg	1	2	1	6	250
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	<1	<1	<1	1	27
Zinc	mg/kg	5	<1	<1	10	140

Acid Extractable metals in soil						
Our Reference		329662-9	329662-11	329662-13	329662-14	329662-15
Your Reference	UNITS	TP5	BH6	BH7	BH7	BH8
Depth		0.4-0.5	0.1-0.3	0-0.1	0.3-0.4	0.1-0.2
Date Sampled		1/08/2023	1/08/2023	1/08/2023	1/08/2023	1/08/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	04/08/2023	04/08/2023	04/08/2023	04/08/2023	04/08/2023
Date analysed	-	08/08/2023	08/08/2023	08/08/2023	08/08/2023	08/08/2023
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	2	<1	13	8	4
Copper	mg/kg	2	1	110	47	22
Lead	mg/kg	22	7	90	130	29
Mercury	mg/kg	<0.1	<0.1	0.2	0.1	0.1
Nickel	mg/kg	<1	<1	8	4	15
Zinc	mg/kg	5	24	160	220	32

Acid Extractable metals in soil						
Our Reference		329662-17	329662-18	329662-19	329662-21	329662-23
Your Reference	UNITS	BH9	BH9	TP10	SDUP1	SDUP3
Depth		0.12-0.2	0.2-0.35	0-0.1	-	-
Date Sampled		1/08/2023	1/08/2023	2/08/2023	31/07/2023	1/08/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	04/08/2023	04/08/2023	04/08/2023	04/08/2023	04/08/2023
Date analysed	-	08/08/2023	08/08/2023	08/08/2023	08/08/2023	08/08/2023
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	0.9	<0.4	<0.4
Chromium	mg/kg	3	2	24	2	14
Copper	mg/kg	5	2	99	<1	99
Lead	mg/kg	25	14	280	2	93
Mercury	mg/kg	<0.1	<0.1	0.2	<0.1	0.2
Nickel	mg/kg	3	2	15	<1	10
Zinc	mg/kg	23	5	410	1	150

Acid Extractable metals in soil			
Our Reference		329662-26	329662-27
Your Reference	UNITS	TB-S1	TB-S2
Depth		-	-
Date Sampled		31/07/2023	1/08/2023
Type of sample		Soil	Soil
Date prepared	-	04/08/2023	04/08/2023
Date analysed	-	08/08/2023	08/08/2023
Arsenic	mg/kg	<4	<4
Cadmium	mg/kg	<0.4	<0.4
Chromium	mg/kg	3	4
Copper	mg/kg	<1	<1
Lead	mg/kg	4	5
Mercury	mg/kg	<0.1	<0.1
Nickel	mg/kg	<1	<1
Zinc	mg/kg	2	2

Moisture						
Our Reference		329662-2	329662-3	329662-4	329662-6	329662-7
Your Reference	UNITS	BH1	BH1	BH2	BH3	TP5
Depth		0.2-0.3	0.7-1.0	0.15-0.3	0.2-0.4	0.1-0.2
Date Sampled		31/07/2023	31/07/2023	31/07/2023	2/08/2023	1/08/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	04/08/2023	04/08/2023	04/08/2023	04/08/2023	04/08/2023
Date analysed	-	07/08/2023	07/08/2023	07/08/2023	07/08/2023	07/08/2023
Moisture	%	6.7	6.8	8.2	13	11

Moisture						
Our Reference		329662-9	329662-11	329662-13	329662-14	329662-15
Your Reference	UNITS	TP5	BH6	BH7	BH7	BH8
Depth		0.4-0.5	0.1-0.3	0-0.1	0.3-0.4	0.1-0.2
Date Sampled		1/08/2023	1/08/2023	1/08/2023	1/08/2023	1/08/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	04/08/2023	04/08/2023	04/08/2023	04/08/2023	04/08/2023
Date analysed	-	07/08/2023	07/08/2023	07/08/2023	07/08/2023	07/08/2023
Moisture	%	12	8.4	17	14	13

Moisture						
Our Reference		329662-17	329662-18	329662-19	329662-21	329662-23
Your Reference	UNITS	BH9	BH9	TP10	SDUP1	SDUP3
Depth		0.12-0.2	0.2-0.35	0-0.1	-	-
Date Sampled		1/08/2023	1/08/2023	2/08/2023	31/07/2023	1/08/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	04/08/2023	04/08/2023	04/08/2023	04/08/2023	04/08/2023
Date analysed	-	07/08/2023	07/08/2023	07/08/2023	07/08/2023	07/08/2023
Moisture	%	9.9	7.7	17	4.8	19

Moisture			
Our Reference		329662-26	329662-27
Your Reference	UNITS	TB-S1	TB-S2
Depth		-	-
Date Sampled		31/07/2023	1/08/2023
Type of sample		Soil	Soil
Date prepared	-	04/08/2023	04/08/2023
Date analysed	-	07/08/2023	07/08/2023
Moisture	%	0.7	0.5

Asbestos ID - soils NEPM - ASB-001						
Our Reference		329662-2	329662-4	329662-7	329662-11	329662-13
Your Reference	UNITS	BH1	BH2	TP5	BH6	BH7
Depth		0.2-0.3	0.15-0.3	0.1-0.2	0.1-0.3	0-0.1
Date Sampled		31/07/2023	31/07/2023	1/08/2023	1/08/2023	1/08/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	10/08/2023	10/08/2023	10/08/2023	10/08/2023	10/08/2023
Sample mass tested	g	418.28	871.11	658.96	837.7	435.93
Sample Description	-	Grey coarse-grained soil & rocks	Beige fine-grained soil & rocks	Grey coarse-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos#1	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–	–	–	–
FA and AF Estimation*	g	–	–	–	–	–
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01	<0.01	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM - ASB-001				
Our Reference		329662-15	329662-17	329662-19
Your Reference	UNITS	BH8	BH9	TP10
Depth		0.1-0.2	0.12-0.2	0-0.1
Date Sampled		1/08/2023	1/08/2023	2/08/2023
Type of sample		Soil	Soil	Soil
Date analysed	-	10/08/2023	10/08/2023	10/08/2023
Sample mass tested	g	756.95	826.43	514.34
Sample Description	-	Grey coarse-grained soil & rocks	Beige coarse-grained soil & rocks	Brown fine-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos#1	g/kg	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–	–
FA and AF Estimation*	g	–	–	–
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001

Asbestos ID - soils		
Our Reference		329662-6
Your Reference	UNITS	BH3
Depth		0.2-0.4
Date Sampled		2/08/2023
Type of sample		Soil
Date analysed	-	11/08/2023
Sample mass tested	g	Approx. 35g
Sample Description	-	White coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected

vTRH(C6-C10)/BTEXN in Water			
Our Reference		329662-28	329662-29
Your Reference	UNITS	FR1-SPT	FR2-HA
Depth		-	-
Date Sampled		31/07/2023	1/08/2023
Type of sample		Water	Water
Date extracted	-	09/08/2023	09/08/2023
Date analysed	-	10/08/2023	10/08/2023
TRH C_6 - C_9	µg/L	<10	17
TRH C_6 - C_{10}	µg/L	<10	17
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10	17
Benzene	µg/L	<1	<1
Toluene	µg/L	<1	<1
Ethylbenzene	µg/L	<1	<1
m+p-xylene	µg/L	<2	<2
o-xylene	µg/L	<1	<1
Naphthalene	µg/L	<1	<1
Surrogate Dibromofluoromethane	%	96	96
Surrogate toluene-d8	%	99	99
Surrogate 4-BFB	%	103	102

svTRH (C10-C40) in Water			
Our Reference		329662-28	329662-29
Your Reference	UNITS	FR1-SPT	FR2-HA
Depth		-	-
Date Sampled		31/07/2023	1/08/2023
Type of sample		Water	Water
Date extracted	-	07/08/2023	07/08/2023
Date analysed	-	08/08/2023	08/08/2023
TRH C_{10} - C_{14}	µg/L	<50	<50
TRH C_{15} - C_{28}	µg/L	<100	<100
TRH C_{29} - C_{36}	µg/L	<100	<100
Total +ve TRH (C10-C36)	µg/L	<50	<50
TRH >C_{10} - C_{16}	µg/L	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50	<50
TRH >C_{16} - C_{34}	µg/L	<100	<100
TRH >C_{34} - C_{40}	µg/L	<100	<100
Total +ve TRH (>C10-C40)	µg/L	<50	<50
Surrogate o-Terphenyl	%	82	75

PAHs in Water			
Our Reference		329662-28	329662-29
Your Reference	UNITS	FR1-SPT	FR2-HA
Depth		-	-
Date Sampled		31/07/2023	1/08/2023
Type of sample		Water	Water
Date extracted	-	07/08/2023	07/08/2023
Date analysed	-	09/08/2023	09/08/2023
Naphthalene	µg/L	<0.2	<0.2
Acenaphthylene	µg/L	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5
Total +ve PAH's	µg/L	<0.1	<0.1
Surrogate p-Terphenyl-d14	%	67	79

Metals in Waters - Acid extractable			
Our Reference		329662-28	329662-29
Your Reference	UNITS	FR1-SPT	FR2-HA
Depth		-	-
Date Sampled		31/07/2023	1/08/2023
Type of sample		Water	Water
Date prepared	-	08/08/2023	08/08/2023
Date analysed	-	08/08/2023	08/08/2023
Arsenic - Total	mg/L	<0.05	<0.05
Cadmium - Total	mg/L	<0.01	<0.01
Chromium - Total	mg/L	<0.01	<0.01
Copper - Total	mg/L	<0.01	0.08
Lead - Total	mg/L	<0.03	<0.03
Mercury - Total	mg/L	<0.0005	<0.0005
Nickel - Total	mg/L	<0.02	<0.02
Zinc - Total	mg/L	<0.02	<0.02

PFAS in Waters Extended			
Our Reference		329662-28	329662-29
Your Reference	UNITS	FR1-SPT	FR2-HA
Depth		-	-
Date Sampled		31/07/2023	1/08/2023
Type of sample		Water	Water
Date prepared	-	04/08/2023	04/08/2023
Date analysed	-	04/08/2023	04/08/2023
Perfluorobutanesulfonic acid	µg/L	<0.01	<0.01
Perfluoropentanesulfonic acid	µg/L	<0.01	<0.01
Perfluorohexanesulfonic acid - PFHxS	µg/L	<0.01	<0.01
Perfluoroheptanesulfonic acid	µg/L	<0.01	<0.01
Perfluorooctanesulfonic acid PFOS	µg/L	<0.01	<0.01
Perfluorodecanesulfonic acid	µg/L	<0.02	<0.02
Perfluorobutanoic acid	µg/L	<0.02	<0.02
Perfluoropentanoic acid	µg/L	<0.02	<0.02
Perfluorohexanoic acid	µg/L	<0.01	<0.01
Perfluoroheptanoic acid	µg/L	<0.01	<0.01
Perfluorooctanoic acid PFOA	µg/L	<0.01	<0.01
Perfluorononanoic acid	µg/L	<0.01	<0.01
Perfluorodecanoic acid	µg/L	<0.02	<0.02
Perfluoroundecanoic acid	µg/L	<0.02	<0.02
Perfluorododecanoic acid	µg/L	<0.05	<0.05
Perfluorotridecanoic acid	µg/L	<0.1	<0.1
Perfluorotetradecanoic acid	µg/L	<0.5	<0.5
4:2 FTS	µg/L	<0.01	<0.01
6:2 FTS	µg/L	<0.01	<0.01
8:2 FTS	µg/L	<0.02	<0.02
10:2 FTS	µg/L	<0.02	<0.02
Perfluorooctane sulfonamide	µg/L	<0.1	<0.1
N-Methyl perfluorooctane sulfonamide	µg/L	<0.05	<0.05
N-Ethyl perfluorooctanesulfon amide	µg/L	<0.1	<0.1
N-Me perfluorooctanesulfonamid oethanol	µg/L	<0.05	<0.05
N-Et perfluorooctanesulfonamid oethanol	µg/L	<0.5	<0.5
MePerfluorooctanesulf- amid oacetic acid	µg/L	<0.02	<0.02
EtPerfluorooctanesulf- amid oacetic acid	µg/L	<0.02	<0.02
Surrogate $^{13}C_8$ *PFOS*	%	100	98
Surrogate $^{13}C_2$ *PFOA*	%	101	96
Extracted ISTD $^{13}C_3$ *PFBS*	%	102	101
Extracted ISTD $^{18}O_2$ *PFHxS*	%	100	106
Extracted ISTD $^{13}C_4$ *PFOS*	%	105	104

PFAS in Waters Extended			
Our Reference		329662-28	329662-29
Your Reference	UNITS	FR1-SPT	FR2-HA
Depth		-	-
Date Sampled		31/07/2023	1/08/2023
Type of sample		Water	Water
Extracted ISTD $^{13}C_4$ *PFBA*	%	108	108
Extracted ISTD $^{13}C_3$ *PFPeA*	%	108	106
Extracted ISTD $^{13}C_2$ *PFHxA*	%	104	105
Extracted ISTD $^{13}C_4$ *PFHpA*	%	108	105
Extracted ISTD $^{13}C_4$ *PFOA*	%	105	110
Extracted ISTD $^{13}C_5$ *PFNA*	%	97	101
Extracted ISTD $^{13}C_2$ *PFDA*	%	112	110
Extracted ISTD $^{13}C_2$ *PFUnDA*	%	111	116
Extracted ISTD $^{13}C_2$ *PFDoDA*	%	107	109
Extracted ISTD $^{13}C_2$ *PFTeDA*	%	90	81
Extracted ISTD $^{13}C_2$ *4:2FTS*	%	112	117
Extracted ISTD $^{13}C_2$ *6:2FTS*	%	112	117
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	142	142
Extracted ISTD $^{13}C_8$ *FOSA*	%	112	111
Extracted ISTD d_3 *N MeFOSA*	%	106	101
Extracted ISTD d_5 *N EtFOSA*	%	107	106
Extracted ISTD d_7 *N MeFOSE*	%	104	100
Extracted ISTD d_9 *N EtFOSE*	%	100	102
Extracted ISTD d_3 *N MeFOSAA*	%	118	109
Extracted ISTD d_5 *N EtFOSAA*	%	129	133
Total Positive PFHxS & PFOS	µg/L	<0.01	<0.01
Total Positive PFOA & PFOS	µg/L	<0.01	<0.01
Total Positive PFAS	µg/L	<0.01	<0.01

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. **NOTE** #1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF) **NOTE** #2 The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation = Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.

Method ID	Methodology Summary
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. ‘EQ PQL’values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. ‘EQ zero’values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. ‘EQ half PQL’values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

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

QUALITY CONTROL: PFAS in Soils Extended					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-14	329662-4
Date prepared	-			04/08/2023	2	04/08/2023	04/08/2023		04/08/2023	04/08/2023
Date analysed	-			04/08/2023	2	04/08/2023	04/08/2023		04/08/2023	04/08/2023
Perfluorobutanesulfonic acid	µg/kg	0.1	Org-029	<0.1	2	<0.1	<0.1	0	106	102
Perfluoropentanesulfonic acid	µg/kg	0.1	Org-029	<0.1	2	<0.1	<0.1	0	106	111
Perfluorohexanesulfonic acid - PFHxS	µg/kg	0.1	Org-029	<0.1	2	<0.1	<0.1	0	113	116
Perfluoroheptanesulfonic acid	µg/kg	0.1	Org-029	<0.1	2	<0.1	<0.1	0	104	110
Perfluorooctanesulfonic acid PFOS	µg/kg	0.1	Org-029	<0.1	2	<0.1	<0.1	0	110	101
Perfluorodecanesulfonic acid	µg/kg	0.2	Org-029	<0.2	2	<0.2	<0.2	0	88	96
Perfluorobutanoic acid	µg/kg	0.2	Org-029	<0.2	2	<0.2	<0.2	0	105	106
Perfluoropentanoic acid	µg/kg	0.2	Org-029	<0.2	2	<0.2	<0.2	0	120	123
Perfluorohexanoic acid	µg/kg	0.1	Org-029	<0.1	2	<0.1	<0.1	0	106	104
Perfluoroheptanoic acid	µg/kg	0.1	Org-029	<0.1	2	<0.1	<0.1	0	101	105
Perfluorooctanoic acid PFOA	µg/kg	0.1	Org-029	<0.1	2	<0.1	<0.1	0	104	100
Perfluorononanoic acid	µg/kg	0.1	Org-029	<0.1	2	<0.1	<0.1	0	99	99
Perfluorodecanoic acid	µg/kg	0.5	Org-029	<0.5	2	<0.5	<0.5	0	108	113
Perfluoroundecanoic acid	µg/kg	0.5	Org-029	<0.5	2	<0.5	<0.5	0	105	115
Perfluorododecanoic acid	µg/kg	0.5	Org-029	<0.5	2	<0.5	<0.5	0	104	108
Perfluorotridecanoic acid	µg/kg	0.5	Org-029	<0.5	2	<0.5	<0.5	0	98	101
Perfluorotetradecanoic acid	µg/kg	5	Org-029	<5	2	<5	<5	0	115	110
4:2 FTS	µg/kg	0.1	Org-029	<0.1	2	<0.1	<0.1	0	102	106
6:2 FTS	µg/kg	0.1	Org-029	<0.1	2	<0.1	<0.1	0	107	102
8:2 FTS	µg/kg	0.2	Org-029	<0.2	2	<0.2	<0.2	0	112	100
10:2 FTS	µg/kg	0.2	Org-029	<0.2	2	<0.2	<0.2	0	101	98
Perfluorooctane sulfonamide	µg/kg	1	Org-029	<1	2	<1	<1	0	115	111
N-Methyl perfluorooctane sulfonamide	µg/kg	1	Org-029	<1	2	<1	<1	0	105	106
N-Ethyl perfluorooctanesulfon amide	µg/kg	1	Org-029	<1	2	<1	<1	0	94	98
N-Me perfluorooctanesulfonamid oethanol	µg/kg	1	Org-029	<1	2	<1	<1	0	104	100
N-Et perfluorooctanesulfonamid oethanol	µg/kg	5	Org-029	<5	2	<5	<5	0	120	119
MePerfluorooctanesulf- amid oacetic acid	µg/kg	0.2	Org-029	<0.2	2	<0.2	<0.2	0	91	99
EtPerfluorooctanesulf amid oacetic acid	µg/kg	0.2	Org-029	<0.2	2	<0.2	<0.2	0	92	90
Surrogate $^{13}C_8$ *PFOS*	%		Org-029	97	2	106	103	3	102	94
Surrogate $^{13}C_2$ *PFOA*	%		Org-029	95	2	88	86	2	92	94

QUALITY CONTROL: PFAS in Soils Extended						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-14	329662-4
Extracted ISTD $^{13}C_3$ *PFBS*	%		Org-029	94	2	87	85	2	89	88
Extracted ISTD $^{18}O_2$ *PFHxS*	%		Org-029	95	2	88	88	0	89	85
Extracted ISTD $^{13}C_4$ *PFOS*	%		Org-029	108	2	101	99	2	100	101
Extracted ISTD $^{13}C_4$ *PFBA*	%		Org-029	106	2	102	103	1	103	96
Extracted ISTD $^{13}C_3$ *PFPeA*	%		Org-029	95	2	84	91	8	90	86
Extracted ISTD $^{13}C_2$ *PFHxA*	%		Org-029	109	2	106	98	8	102	97
Extracted ISTD $^{13}C_4$ *PFHpA*	%		Org-029	111	2	101	101	0	105	96
Extracted ISTD $^{13}C_4$ *PFOA*	%		Org-029	113	2	110	108	2	107	100
Extracted ISTD $^{13}C_5$ *PFNA*	%		Org-029	97	2	101	98	3	96	92
Extracted ISTD $^{13}C_2$ *PFDA*	%		Org-029	100	2	95	92	3	106	92
Extracted ISTD $^{13}C_2$ *PFUnDA*	%		Org-029	115	2	105	97	8	111	98
Extracted ISTD $^{13}C_2$ *PFDoDA*	%		Org-029	124	2	107	103	4	117	101
Extracted ISTD $^{13}C_2$ *PFTeDA*	%		Org-029	117	2	109	107	2	108	100
Extracted ISTD $^{13}C_2$ *4:2FTS*	%		Org-029	120	2	105	104	1	116	101
Extracted ISTD $^{13}C_2$ *6:2FTS*	%		Org-029	113	2	99	95	4	104	94
Extracted ISTD $^{13}C_2$ *8:2FTS*	%		Org-029	119	2	111	112	1	107	101
Extracted ISTD $^{13}C_8$ *FOSA*	%		Org-029	104	2	107	104	3	104	103
Extracted ISTD d_3 *N MeFOSA*	%		Org-029	99	2	100	103	3	101	97
Extracted ISTD d_5 *N EtFOSA*	%		Org-029	106	2	106	106	0	104	97
Extracted ISTD d_7 *N MeFOSE*	%		Org-029	97	2	95	96	1	97	92

QUALITY CONTROL: PFAS in Soils Extended					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-14	329662-4
Extracted ISTD d_9 N EtFOSE	%		Org-029	104	2	102	98	4	100	98
Extracted ISTD d_3 N MeFOSAA	%		Org-029	117	2	106	102	4	111	97
Extracted ISTD d_5 N EtFOSAA	%		Org-029	115	2	122	111	9	117	103

QUALITY CONTROL: PFAS in Soils Extended					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	19	04/08/2023	04/08/2023		[NT]	[NT]
Date analysed	-			[NT]	19	04/08/2023	04/08/2023		[NT]	[NT]
Perfluorobutanesulfonic acid	µg/kg	0.1	Org-029	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Perfluoropentanesulfonic acid	µg/kg	0.1	Org-029	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Perfluorohexanesulfonic acid - PFHxS	µg/kg	0.1	Org-029	[NT]	19	0.4	0.6	40	[NT]	[NT]
Perfluoroheptanesulfonic acid	µg/kg	0.1	Org-029	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Perfluorooctanesulfonic acid PFOS	µg/kg	0.1	Org-029	[NT]	19	6.7	6.5	3	[NT]	[NT]
Perfluorodecanesulfonic acid	µg/kg	0.2	Org-029	[NT]	19	0.2	<0.2	0	[NT]	[NT]
Perfluorobutanoic acid	µg/kg	0.2	Org-029	[NT]	19	<0.2	<0.2	0	[NT]	[NT]
Perfluoropentanoic acid	µg/kg	0.2	Org-029	[NT]	19	0.3	0.4	29	[NT]	[NT]
Perfluorohexanoic acid	µg/kg	0.1	Org-029	[NT]	19	0.1	0.1	0	[NT]	[NT]
Perfluoroheptanoic acid	µg/kg	0.1	Org-029	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Perfluorooctanoic acid PFOA	µg/kg	0.1	Org-029	[NT]	19	0.3	0.4	29	[NT]	[NT]
Perfluorononanoic acid	µg/kg	0.1	Org-029	[NT]	19	0.2	0.1	67	[NT]	[NT]
Perfluorodecanoic acid	µg/kg	0.5	Org-029	[NT]	19	0.8	0.8	0	[NT]	[NT]
Perfluoroundecanoic acid	µg/kg	0.5	Org-029	[NT]	19	<0.5	<0.5	0	[NT]	[NT]
Perfluorododecanoic acid	µg/kg	0.5	Org-029	[NT]	19	1	1	0	[NT]	[NT]
Perfluorotridecanoic acid	µg/kg	0.5	Org-029	[NT]	19	<0.5	<0.5	0	[NT]	[NT]
Perfluorotetradecanoic acid	µg/kg	5	Org-029	[NT]	19	<5	<5	0	[NT]	[NT]
4:2 FTS	µg/kg	0.1	Org-029	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
6:2 FTS	µg/kg	0.1	Org-029	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
8:2 FTS	µg/kg	0.2	Org-029	[NT]	19	<0.2	<0.2	0	[NT]	[NT]
10:2 FTS	µg/kg	0.2	Org-029	[NT]	19	<0.2	<0.2	0	[NT]	[NT]
Perfluorooctane sulfonamide	µg/kg	1	Org-029	[NT]	19	<1	<1	0	[NT]	[NT]
N-Methyl perfluorooctane sulfonamide	µg/kg	1	Org-029	[NT]	19	<1	<1	0	[NT]	[NT]
N-Ethyl perfluorooctanesulfon amide	µg/kg	1	Org-029	[NT]	19	<1	<1	0	[NT]	[NT]
N-Me perfluorooctanesulfonamid oethanol	µg/kg	1	Org-029	[NT]	19	<1	<1	0	[NT]	[NT]
N-Et perfluorooctanesulfonamid oethanol	µg/kg	5	Org-029	[NT]	19	<5	<5	0	[NT]	[NT]
MePerfluorooctanesulf- amid oacetic acid	µg/kg	0.2	Org-029	[NT]	19	<0.2	<0.2	0	[NT]	[NT]
EtPerfluorooctanesulf amid oacetic acid	µg/kg	0.2	Org-029	[NT]	19	<0.2	<0.2	0	[NT]	[NT]
Surrogate $^{13}C_8$ *PFOS*	%		Org-029	[NT]	19	104	98	6	[NT]	[NT]
Surrogate $^{13}C_2$ *PFOA*	%		Org-029	[NT]	19	81	79	2	[NT]	[NT]

QUALITY CONTROL: PFAS in Soils Extended					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Extracted ISTD $^{13}C_3$ *PFBS*	%		Org-029	[NT]	19	90	87	3	[NT]	[NT]
Extracted ISTD $^{18}O_2$ *PFHxS*	%		Org-029	[NT]	19	88	90	2	[NT]	[NT]
Extracted ISTD $^{13}C_4$ *PFOS*	%		Org-029	[NT]	19	100	102	2	[NT]	[NT]
Extracted ISTD $^{13}C_4$ *PFBA*	%		Org-029	[NT]	19	103	96	7	[NT]	[NT]
Extracted ISTD $^{13}C_3$ *PFPeA*	%		Org-029	[NT]	19	89	79	12	[NT]	[NT]
Extracted ISTD $^{13}C_2$ *PFHxA*	%		Org-029	[NT]	19	105	96	9	[NT]	[NT]
Extracted ISTD $^{13}C_4$ *PFHpA*	%		Org-029	[NT]	19	109	105	4	[NT]	[NT]
Extracted ISTD $^{13}C_4$ *PFOA*	%		Org-029	[NT]	19	121	117	3	[NT]	[NT]
Extracted ISTD $^{13}C_5$ *PFNA*	%		Org-029	[NT]	19	88	76	15	[NT]	[NT]
Extracted ISTD $^{13}C_2$ *PFDA*	%		Org-029	[NT]	19	105	113	7	[NT]	[NT]
Extracted ISTD $^{13}C_2$ *PFUnDA*	%		Org-029	[NT]	19	117	119	2	[NT]	[NT]
Extracted ISTD $^{13}C_2$ *PFDoDA*	%		Org-029	[NT]	19	123	126	2	[NT]	[NT]
Extracted ISTD $^{13}C_2$ *PFTeDA*	%		Org-029	[NT]	19	84	81	4	[NT]	[NT]
Extracted ISTD $^{13}C_2$ *4:2FTS*	%		Org-029	[NT]	19	141	103	31	[NT]	[NT]
Extracted ISTD $^{13}C_2$ *6:2FTS*	%		Org-029	[NT]	19	159	152	5	[NT]	[NT]
Extracted ISTD $^{13}C_2$ *8:2FTS*	%		Org-029	[NT]	19	171	147	15	[NT]	[NT]
Extracted ISTD $^{13}C_8$ *FOSA*	%		Org-029	[NT]	19	77	73	5	[NT]	[NT]
Extracted ISTD d_3 *N MeFOSA*	%		Org-029	[NT]	19	74	73	1	[NT]	[NT]
Extracted ISTD d_5 *N EtFOSA*	%		Org-029	[NT]	19	83	80	4	[NT]	[NT]
Extracted ISTD d_7 *N MeFOSE*	%		Org-029	[NT]	19	68	67	1	[NT]	[NT]

QUALITY CONTROL: PFAS in Soils Extended					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Extracted ISTD d_9 N EtFOSE	%		Org-029	[NT]	19	78	81	4	[NT]	[NT]
Extracted ISTD d_3 N MeFOSAA	%		Org-029	[NT]	19	148	149	1	[NT]	[NT]
Extracted ISTD d_5 N EtFOSAA	%		Org-029	[NT]	19	141	133	6	[NT]	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-14	329662-4
Date extracted	-			04/08/2023	2	04/08/2023	04/08/2023		04/08/2023	04/08/2023
Date analysed	-			07/08/2023	2	07/08/2023	07/08/2023		07/08/2023	07/08/2023
TRH C_6 - C_9	mg/kg	25	Org-023	<25	2	<25	<25	0	111	88
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	2	<25	<25	0	111	88
Benzene	mg/kg	0.2	Org-023	<0.2	2	<0.2	<0.2	0	118	94
Toluene	mg/kg	0.5	Org-023	<0.5	2	<0.5	<0.5	0	111	88
Ethylbenzene	mg/kg	1	Org-023	<1	2	<1	<1	0	108	85
m+p-xylene	mg/kg	2	Org-023	<2	2	<2	<2	0	108	86
o-Xylene	mg/kg	1	Org-023	<1	2	<1	<1	0	115	91
Naphthalene	mg/kg	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	92	2	101	86	16	96	73

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-15	[NT]
Date extracted	-			[NT]	19	04/08/2023	04/08/2023		04/08/2023	[NT]
Date analysed	-			[NT]	19	07/08/2023	07/08/2023		07/08/2023	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	[NT]	19	<25	<25	0	121	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	[NT]	19	<25	<25	0	121	[NT]
Benzene	mg/kg	0.2	Org-023	[NT]	19	<0.2	<0.2	0	129	[NT]
Toluene	mg/kg	0.5	Org-023	[NT]	19	<0.5	<0.5	0	121	[NT]
Ethylbenzene	mg/kg	1	Org-023	[NT]	19	<1	<1	0	118	[NT]
m+p-xylene	mg/kg	2	Org-023	[NT]	19	<2	<2	0	118	[NT]
o-Xylene	mg/kg	1	Org-023	[NT]	19	<1	<1	0	127	[NT]
Naphthalene	mg/kg	1	Org-023	[NT]	19	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	19	93	77	19	102	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-14	329662-4
Date extracted	-			04/08/2023	2	04/08/2023	04/08/2023		04/08/2023	04/08/2023
Date analysed	-			05/08/2023	2	05/08/2023	05/08/2023		05/08/2023	05/08/2023
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	2	<50	<50	0	109	97
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	2	<100	<100	0	110	101
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	2	<100	<100	0	114	84
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	2	<50	<50	0	109	97
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	2	<100	<100	0	110	101
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	2	<100	<100	0	114	84
Surrogate o-Terphenyl	%		Org-020	90	2	90	93	3	102	93

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-15	[NT]
Date extracted	-			[NT]	19	04/08/2023	04/08/2023		04/08/2023	[NT]
Date analysed	-			[NT]	19	06/08/2023	06/08/2023		05/08/2023	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	19	92	100	8	104	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	19	1200	1100	9	106	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	19	2200	1900	15	100	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	[NT]	19	97	110	13	104	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	[NT]	19	2800	2500	11	106	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	[NT]	19	1300	1200	8	100	[NT]
Surrogate o-Terphenyl	%		Org-020	[NT]	19	122	105	15	97	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-14	329662-4
Date extracted	-			04/08/2023	2	04/08/2023	04/08/2023		04/08/2023	04/08/2023
Date analysed	-			07/08/2023	2	07/08/2023	07/08/2023		07/08/2023	07/08/2023
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	99	84
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	107	87
Fluorene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	90	80
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	96	80
Anthracene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	104	82
Pyrene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	95	85
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	93	75
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	2	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	2	<0.05	<0.05	0	90	86
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	95	2	80	80	0	99	82

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-15	[NT]
Date extracted	-			[NT]	19	04/08/2023	04/08/2023		04/08/2023	[NT]
Date analysed	-			[NT]	19	07/08/2023	07/08/2023		07/08/2023	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	86	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	87	[NT]
Fluorene	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	86	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	19	0.1	0.2	67	86	[NT]
Anthracene	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	19	0.3	0.3	0	88	[NT]
Pyrene	mg/kg	0.1	Org-022/025	[NT]	19	0.3	0.3	0	87	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	19	0.2	0.2	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	19	0.2	0.2	0	77	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	19	0.3	0.3	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	19	0.2	0.2	0	92	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	19	0.2	0.2	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	19	77	75	3	81	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-14	329662-4
Date extracted	-			04/08/2023	2	04/08/2023	04/08/2023		04/08/2023	04/08/2023
Date analysed	-			07/08/2023	2	07/08/2023	07/08/2023		07/08/2023	07/08/2023
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	90	86
HCB	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	90	88
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	87	79
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	89	87
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	84	82
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	98	94
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	100	94
Endrin	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	92	86
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	82	78
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	70	62
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Mirex	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	100	2	111	109	2	103	104

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	19	04/08/2023	04/08/2023		[NT]	[NT]
Date analysed	-			[NT]	19	07/08/2023	07/08/2023		[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
HCB	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Mirex	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	19	99	101	2	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-14	329662-4
Date extracted	-			04/08/2023	2	04/08/2023	04/08/2023		04/08/2023	04/08/2023
Date analysed	-			07/08/2023	2	07/08/2023	07/08/2023		07/08/2023	07/08/2023
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	101	95
Mevinphos	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Phorate	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Disulfoton	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Parathion-Methyl	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	83	77
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	103	91
Malathion	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	93	83
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	84	82
Fenthion	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	99	87
Bromophos-ethyl	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Methidathion	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Fenamiphos	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	78	72
Phosalone	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Coumaphos	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	100	2	111	109	2	103	104

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	19	04/08/2023	04/08/2023		[NT]	[NT]
Date analysed	-			[NT]	19	07/08/2023	07/08/2023		[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Mevinphos	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Phorate	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Disulfoton	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Parathion-Methyl	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Fenthion	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Methidathion	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Fenamiphos	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Phosalone	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Coumaphos	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	19	99	101	2	[NT]	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-14	329662-4
Date extracted	-			04/08/2023	2	04/08/2023	04/08/2023		04/08/2023	04/08/2023
Date analysed	-			09/08/2023	2	07/08/2023	07/08/2023		09/08/2023	07/08/2023
Aroclor 1016	mg/kg	0.1	Org-021	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	<0.1	2	<0.1	<0.1	0	107	90
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	113	2	111	109	2	118	104

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	19	04/08/2023	04/08/2023		[NT]	[NT]
Date analysed	-			[NT]	19	07/08/2023	07/08/2023		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-021	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	[NT]	19	0.6	0.7	15	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	[NT]	19	99	101	2	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-14	329662-4
Date prepared	-			04/08/2023	2	04/08/2023	04/08/2023		04/08/2023	04/08/2023
Date analysed	-			08/08/2023	2	08/08/2023	08/08/2023		08/08/2023	08/08/2023
Arsenic	mg/kg	4	Metals-020	<4	2	<4	<4	0	107	105
Cadmium	mg/kg	0.4	Metals-020	<0.4	2	<0.4	<0.4	0	101	99
Chromium	mg/kg	1	Metals-020	<1	2	<1	<1	0	113	102
Copper	mg/kg	1	Metals-020	<1	2	<1	<1	0	109	106
Lead	mg/kg	1	Metals-020	<1	2	1	<1	0	111	101
Mercury	mg/kg	0.1	Metals-021	<0.1	2	<0.1	<0.1	0	123	122
Nickel	mg/kg	1	Metals-020	<1	2	<1	<1	0	103	101
Zinc	mg/kg	1	Metals-020	<1	2	5	4	22	107	97

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	19	04/08/2023	04/08/2023		[NT]	[NT]
Date analysed	-			[NT]	19	08/08/2023	08/08/2023		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	19	<4	<4	0	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	19	0.9	0.9	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	19	24	24	0	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	19	99	100	1	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	19	280	250	11	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	19	0.2	0.2	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	19	15	16	6	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	19	410	390	5	[NT]	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	[NT]
Date extracted	-			09/08/2023	[NT]	[NT]	[NT]	[NT]	09/08/2023	[NT]
Date analysed	-			10/08/2023	[NT]	[NT]	[NT]	[NT]	10/08/2023	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	105	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	105	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	106	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]
Naphthalene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	96	[NT]	[NT]	[NT]	[NT]	97	[NT]
Surrogate toluene-d8	%		Org-023	99	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate 4-BFB	%		Org-023	102	[NT]	[NT]	[NT]	[NT]	105	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water					Duplicate					Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			07/08/2023	[NT]	[NT]	[NT]	[NT]	07/08/2023	[NT]
Date analysed	-			07/08/2023	[NT]	[NT]	[NT]	[NT]	07/08/2023	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	104	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	119	[NT]
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	114	[NT]
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	104	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	119	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	114	[NT]
Surrogate o-Terphenyl	%		Org-020	95	[NT]	[NT]	[NT]	[NT]	110	[NT]

QUALITY CONTROL: PAHs in Water					Duplicate					Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			07/08/2023	[NT]	[NT]	[NT]	[NT]	07/08/2023	[NT]
Date analysed	-			09/08/2023	[NT]	[NT]	[NT]	[NT]	09/08/2023	[NT]
Naphthalene	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	76	[NT]
Acenaphthylene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	77	[NT]
Fluorene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	72	[NT]
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	76	[NT]
Anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	75	[NT]
Pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	79	[NT]
Benzo(a)anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	81	[NT]
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	73	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	73	[NT]	[NT]	[NT]	[NT]	67	[NT]

QUALITY CONTROL: Metals in Waters - Acid extractable					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			08/08/2023	[NT]	[NT]	[NT]	[NT]	08/08/2023	[NT]
Date analysed	-			08/08/2023	[NT]	[NT]	[NT]	[NT]	08/08/2023	[NT]
Arsenic - Total	mg/L	0.05	Metals-020	<0.05	[NT]	[NT]	[NT]	[NT]	108	[NT]
Cadmium - Total	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	98	[NT]
Chromium - Total	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	100	[NT]
Copper - Total	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	104	[NT]
Lead - Total	mg/L	0.03	Metals-020	<0.03	[NT]	[NT]	[NT]	[NT]	103	[NT]
Mercury - Total	mg/L	0.0005	Metals-021	<0.0005	[NT]	[NT]	[NT]	[NT]	117	[NT]
Nickel - Total	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	103	[NT]
Zinc - Total	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	106	[NT]

QUALITY CONTROL: PFAS in Waters Extended					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	329662-29
Date prepared	-			04/08/2023	28	04/08/2023	04/08/2023		04/08/2023	04/08/2023
Date analysed	-			04/08/2023	28	04/08/2023	04/08/2023		04/08/2023	04/08/2023
Perfluorobutanesulfonic acid	µg/L	0.01	Org-029	<0.01	28	<0.01	<0.01	0	106	97
Perfluoropentanesulfonic acid	µg/L	0.01	Org-029	<0.01	28	<0.01	<0.01	0	106	91
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.01	Org-029	<0.01	28	<0.01	<0.01	0	110	94
Perfluoroheptanesulfonic acid	µg/L	0.01	Org-029	<0.01	28	<0.01	<0.01	0	106	90
Perfluorooctanesulfonic acid PFOS	µg/L	0.01	Org-029	<0.01	28	<0.01	<0.01	0	110	100
Perfluorodecanesulfonic acid	µg/L	0.02	Org-029	<0.02	28	<0.02	<0.02	0	91	81
Perfluorobutanoic acid	µg/L	0.02	Org-029	<0.02	28	<0.02	<0.02	0	107	99
Perfluoropentanoic acid	µg/L	0.02	Org-029	<0.02	28	<0.02	<0.02	0	115	105
Perfluorohexanoic acid	µg/L	0.01	Org-029	<0.01	28	<0.01	<0.01	0	108	100
Perfluoroheptanoic acid	µg/L	0.01	Org-029	<0.01	28	<0.01	<0.01	0	103	102
Perfluorooctanoic acid PFOA	µg/L	0.01	Org-029	<0.01	28	<0.01	<0.01	0	106	98
Perfluorononanoic acid	µg/L	0.01	Org-029	<0.01	28	<0.01	<0.01	0	104	101
Perfluorodecanoic acid	µg/L	0.02	Org-029	<0.02	28	<0.02	<0.02	0	113	90
Perfluoroundecanoic acid	µg/L	0.02	Org-029	<0.02	28	<0.02	<0.02	0	111	94
Perfluorododecanoic acid	µg/L	0.05	Org-029	<0.05	28	<0.05	<0.05	0	101	97
Perfluorotridecanoic acid	µg/L	0.1	Org-029	<0.1	28	<0.1	<0.1	0	87	85
Perfluorotetradecanoic acid	µg/L	0.5	Org-029	<0.5	28	<0.5	<0.5	0	115	106
4:2 FTS	µg/L	0.01	Org-029	<0.01	28	<0.01	<0.01	0	106	96
6:2 FTS	µg/L	0.01	Org-029	<0.01	28	<0.01	<0.01	0	111	100
8:2 FTS	µg/L	0.02	Org-029	<0.02	28	<0.02	<0.02	0	105	102
10:2 FTS	µg/L	0.02	Org-029	<0.02	28	<0.02	<0.02	0	122	119
Perfluorooctane sulfonamide	µg/L	0.1	Org-029	<0.1	28	<0.1	<0.1	0	119	109
N-Methyl perfluorooctane sulfonamide	µg/L	0.05	Org-029	<0.05	28	<0.05	<0.05	0	106	99
N-Ethyl perfluorooctanesulfon amide	µg/L	0.1	Org-029	<0.1	28	<0.1	<0.1	0	92	92
N-Me perfluorooctanesulfonamid oethanol	µg/L	0.05	Org-029	<0.05	28	<0.05	<0.05	0	117	127
N-Et perfluorooctanesulfonamid oethanol	µg/L	0.5	Org-029	<0.5	28	<0.5	<0.5	0	120	115
MePerfluorooctanesulf- amid oacetic acid	µg/L	0.02	Org-029	<0.02	28	<0.02	<0.02	0	97	100
EtPerfluorooctanesulf- amid oacetic acid	µg/L	0.02	Org-029	<0.02	28	<0.02	<0.02	0	103	95
Surrogate $^{13}C_8$ *PFOS*	%		Org-029	95	28	100	100	0	99	99
Surrogate $^{13}C_2$ *PFOA*	%		Org-029	96	28	101	98	3	97	95

QUALITY CONTROL: PFAS in Waters Extended					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	329662-29
Extracted ISTD $^{13}C_3$ PFBS	%		Org-029	95	28	102	106	4	97	101
Extracted ISTD $^{18}O_2$ PFHxS	%		Org-029	96	28	100	105	5	97	108
Extracted ISTD $^{13}C_4$ PFOS	%		Org-029	108	28	105	104	1	101	102
Extracted ISTD $^{13}C_4$ PFBA	%		Org-029	107	28	108	109	1	104	105
Extracted ISTD $^{13}C_3$ PFPeA	%		Org-029	100	28	108	106	2	99	105
Extracted ISTD $^{13}C_2$ PFHxA	%		Org-029	105	28	104	106	2	102	106
Extracted ISTD $^{13}C_4$ PFHpA	%		Org-029	107	28	108	102	6	104	103
Extracted ISTD $^{13}C_4$ PFOA	%		Org-029	110	28	105	110	5	103	109
Extracted ISTD $^{13}C_5$ PFNA	%		Org-029	100	28	97	102	5	101	99
Extracted ISTD $^{13}C_2$ PFDA	%		Org-029	105	28	112	106	6	101	113
Extracted ISTD $^{13}C_2$ PFUnDA	%		Org-029	113	28	111	122	9	109	117
Extracted ISTD $^{13}C_2$ PFDoDA	%		Org-029	109	28	107	110	3	109	108
Extracted ISTD $^{13}C_2$ PFTeDA	%		Org-029	84	28	90	84	7	83	86
Extracted ISTD $^{13}C_2$ 4:2FTS	%		Org-029	117	28	112	126	12	109	112
Extracted ISTD $^{13}C_2$ 6:2FTS	%		Org-029	111	28	112	118	5	101	112
Extracted ISTD $^{13}C_2$ 8:2FTS	%		Org-029	134	28	142	144	1	128	127
Extracted ISTD $^{13}C_8$ FOSA	%		Org-029	109	28	112	108	4	105	105
Extracted ISTD d_3 N MeFOSA	%		Org-029	100	28	106	101	5	101	101
Extracted ISTD d_5 N EtFOSA	%		Org-029	106	28	107	107	0	105	103
Extracted ISTD d_7 N MeFOSE	%		Org-029	95	28	104	98	6	97	101

QUALITY CONTROL: PFAS in Waters Extended					Duplicate					Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	329662-29
Extracted ISTD d_9 *N EtFOSE*	%		Org-029	103	28	100	102	2	103	102
Extracted ISTD d_3 *N MeFOSAA*	%		Org-029	114	28	118	113	4	109	110
Extracted ISTD d_5 *N EtFOSAA*	%		Org-029	130	28	129	134	4	113	123

Result Definitions

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

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

Report Comments

For PFAS Extracted Internal Standards denoted with # or outside the 50-150% acceptance range, the respective target analyte results may be unaffected, in other circumstances the PQL has been raised to accommodate the outlier(s).

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: Sample 329662-6 was sub-sampled from jar provided by the client.

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

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SAMPLE RECEIPT ADVICE

Client Details	
Client	JK Environments
Attention	Vittal Boggaram

Sample Login Details	
Your reference	E34303B, Potts Point
Envirolab Reference	329662
Date Sample Received	03/08/2023
Date Instructions Received	03/08/2023
Date Results Expected to be Reported	11/08/2023

Sample Condition	
Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	27 Soil, 2 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	9
Cooling Method	Ice
Sampling Date Provided	YES

Comments

BH3/0.2-0.4 - no NEMP Asb bag received

Please direct any queries to:

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Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

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Sample ID	PFAS in Soils Extended	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBs in Soil	Acid Extractable metalsin soil	Asbestos ID - soils NEPM - ASB-001	Asbestos ID - soils	vTRH(C6-C10)/BTEXN in Water	svTRH (C10-C40) in Water	PAHs in Water	Metals in Waters -Acid extractable	PFAS in Waters Extended	On Hold
BH1-0.13-0.2																✓
BH1-0.2-0.3	✓	✓	✓	✓	✓	✓	✓	✓	✓							
BH1-0.7-1.0		✓	✓	✓				✓								
BH2-0.15-0.3	✓	✓	✓	✓	✓	✓	✓	✓	✓							
BH2-0.8-1.0																✓
BH3-0.2-0.4		✓	✓	✓	✓	✓	✓	✓		✓						
TP5-0.1-0.2	✓	✓	✓	✓	✓	✓	✓	✓	✓							
TP5-0.2-0.3																✓
TP5-0.4-0.5		✓	✓	✓				✓								
TP5-0.7-0.8																✓
BH6-0.1-0.3	✓	✓	✓	✓	✓	✓	✓	✓	✓							
BH6-0.4-0.5																✓
BH7-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓							
BH7-0.3-0.4		✓	✓	✓				✓								
BH8-0.1-0.2	✓	✓	✓	✓	✓	✓	✓	✓	✓							
BH8-0.3-0.5																✓
BH9-0.12-0.2	✓	✓	✓	✓	✓	✓	✓	✓	✓							
BH9-0.2-0.35		✓	✓	✓				✓								
TP10-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓							
TP10-0.1-0.2																✓
SDUP1		✓	✓	✓				✓								
SDUP2																✓
SDUP3	✓	✓	✓	✓	✓	✓	✓	✓								
TS-S1		✓														
TS-S2		✓														
TB-S1	✓	✓	✓	✓				✓								
TB-S2	✓	✓	✓	✓				✓								
FR1-SPT											✓	✓	✓	✓	✓	
FR2-HA											✓	✓	✓	✓	✓	

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

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

SAMPLE AND CHAIN OF CUSTODY FORM

TO:	JKE Job Number: E34303B	FROM: JKEnvironments
ENVIROLAB SERVICES PTY LTD 12 ASHLEY STREET CHATSWOOD NSW 2067 P: (02) 99106200 F: (02) 99106201 Attention: Aileen	Date Results Required: STANDARD Page: 1 of 2	REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: Vittal Boggaram vboggaram@jkenvironments.com.au

Location: Potts Point

Sampler: CR/AD

Sample Preserved in Esky on Ice

Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 6aNEPM	Combo 6	PFAS (Routine Level Extended)	Combo 3	Asbestos (detection)	BTEX						
31/07/2023	1	BH1	0.13-0.2	G, A, PFAS	1.2	Roadbase												
31/07/2023	2	BH1	0.2-0.3	G, A, PFAS	1.3	F: Silty Sand	X		X									
31/07/2023	3	BH1	0.7-1.0	G, PFAS	0.6	Sandstone				X								
31/07/2023	4	BH2	0.15-0.3	G, A, PFAS	0.8	Sandstone	X		X									
31/07/2023	5	BH2	0.8-1.0	G, PFAS	0.5	Sandstone												
2/08/2023	6	BH3	0.2-0.4	G, PFAS	1	Sandstone	X											
1/08/2023	7	TP5	0.1-0.2	G. A, PFAS	1.1	F: Silty Sand	X		X									
1/08/2023	8	TP5	0.2-0.3	G. A, PFAS	1.4	F: Silty Sand												
1/08/2023	9	TP5	0.4-0.5	G. A, PFAS	1.7	F: Silty Clayey Sand				X								
1/08/2023	10	TP5	0.7-0.8	G. A, PFAS	2.4	F: Silty Clayey Sand												
1/08/2023	11	BH6	0.1-0.3	G. A, PFAS	3.1	F: Silty Sand	X		X									
1/08/2023	12	BH6	0.4-0.5	G	0.5	Sandstone												
1/08/2023	13	BH7	0-0.1	G, A, PFAS	1.7	F: Silty Sand	X		X									
1/08/2023	14	BH7	0.3-0.4	G, A, PFAS	1.8	F: Silty Sand				X								
1/08/2023	15	BH8	0.1-0.2	G, A, PFAS	3.1	F: Silty Sand	X		X									
1/08/2023	16	BH8	0.3-0.5	G, PFAS	0.5	Sandstone												
1/08/2023	17	BH9	0.12-0.2	G, A, PFAS	3	F: Silty Sand	X		X									
1/08/2023	18	BH9	0.2-0.35	G, A, PFAS	2.9	F: Silty Sand				X								
2/08/2023	19	TP10	0-0.1	G, A, PFAS	0.4	F: Silty Sand	X		X									
2/08/2023	20	TP10	0.1-0.2	G, A, PFAS	0.3	F: Silty Sand												

Remarks (comments/detection limits required):

Sample Containers:
G - 250mg Glass Jar
A - Ziplock Asbestos Bag
P - Plastic Bag
G1 - Amber Glass Bottle
V - BTEX Vial
PFAS - (No liner)
H - HN03 wash PVC

Relinquished By:	Date: 3/08/23	Time: 9:45am	Received By:	Date:
VB				

ENVIROLAB

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

Job No: 329662

Date Received: 3/8/23
Time Received: 1630
Received By: ECS S/D
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD 12 ASHLEY STREET CHATSWOOD NSW 2067 P: (02) 99106200 F: (02) 99106201 Attention: Aileen	JKE Job Number: E34303B Date Results Required: STANDARD Page: 2 of 2	JKEnvironments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: Vittal Boggaram vboggaram@jkenvironments.com.au

Location:	Potts Point						Sample Preserved in Esky on Ice											
Sampler:	CR//AD						Tests Required											
Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 6aNEPM	Combo 6	PFAS (Routine Level Extended)	Combo 3	Asbestos (detection)	BTEX						
31/07/2023	21	SDUP1	-	G, PFAS	-	Duplicate				X								
31/07/2023	22	SDUP2	-	G, PFAS	-	Duplicate												
1/08/2023	23	SDUP3	-	G, PFAS	-	Duplicate		X	X									
2/08/2023	[illegible]	SDUP4	-	G, PFAS	-	Duplicate				X	PLEASE SEND TO VIC							
2/08/2026	[illegible]	SDUP5	-	G, PFAS	-	Duplicate		X	X		PLEASE SEND TO VIC							
31/07/2023	24	TS-S1	-	V	-	Spike						X						
1/08/2023	25	TS-S2	-	V	-	Spike						X						
31/07/2023	26	TB-S1	-	G, PFAS	-	Blank			X	X								
1/08/2023	27	TB-S2	-	G, PFAS	-	Blank			X	X								
31/07/2023	28	FR1-SPT	-	G1, H, V, PFAS	-	Rinsate			X	X								
1/08/2023	29	FR2-HA	-	G1, H, PFAS	-	Rinsate			X	X								

Remarks (comments/detection limits required):	Sample Containers: G - 250mg Glass Jar V - BTEX Vial A - Ziplock Asbestos Bag PFAS - (No liner) P - Plastic Bag H - HN03 wash PVC G1 - Amber Glass Bottle		
Relinquished By: VB	Date: 3/08/23	Time: 9:45am	Received By:	Date:

#329662
2/8/23

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CERTIFICATE OF ANALYSIS 329662-A

Client Details

Client	JK Environments
Attention	Vittal Boggaram
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E34303B, Potts Point**
Number of Samples	additional analysis
Date samples received	03/08/2023
Date completed instructions received	15/08/2023

Analysis Details

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

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

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

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

Report Details

Date results requested by	22/08/2023
Date of Issue	22/08/2023

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Results Approved By
Diego Bigolin, Inorganics Supervisor
Dragana Tomas, Senior Chemist
Hannah Nguyen, Metals Supervisor
Loren Bardwell, Development Chemist
Tim Toll, Chemist

Authorised By
Nancy Zhang, Laboratory Manager

TCLP Preparation - Acid				
Our Reference		329662-A-7	329662-A-14	329662-A-19
Your Reference	UNITS	TP5	BH7	TP10
Depth		0.1-0.2	0.3-0.4	0-0.1
Date Sampled		1/08/2023	1/08/2023	2/08/2023
Type of sample		Soil	Soil	Soil
pH of soil for fluid# determ.	pH units	10.5	9.5	9.1
pH of soil TCLP (after HCl)	pH units	2.1	1.9	1.9
Extraction fluid used		1	1	1
pH of final Leachate	pH units	6..1	5.3	5.2

PAHs in TCLP (USEPA 1311)		
Our Reference		329662-A-14
Your Reference	UNITS	BH7
Depth		0.3-0.4
Date Sampled		1/08/2023
Type of sample		Soil
Date extracted	-	18/08/2023
Date analysed	-	18/08/2023
Naphthalene in TCLP	mg/L	<0.001
Acenaphthylene in TCLP	mg/L	<0.001
Acenaphthene in TCLP	mg/L	<0.001
Fluorene in TCLP	mg/L	<0.001
Phenanthrene in TCLP	mg/L	<0.001
Anthracene in TCLP	mg/L	<0.001
Fluoranthene in TCLP	mg/L	<0.001
Pyrene in TCLP	mg/L	<0.001
Benzo(a)anthracene in TCLP	mg/L	<0.001
Chrysene in TCLP	mg/L	<0.001
Benzo(bjk)fluoranthene in TCLP	mg/L	<0.002
Benzo(a)pyrene in TCLP	mg/L	<0.001
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	<0.001
Dibenzo(a,h)anthracene in TCLP	mg/L	<0.001
Benzo(g,h,i)perylene in TCLP	mg/L	<0.001
Total +ve PAH's	mg/L	NIL (+)VE
Surrogate p-Terphenyl-d14	%	99

Metals from Leaching Fluid pH 2.9 or 5				
Our Reference		329662-A-7	329662-A-14	329662-A-19
Your Reference	UNITS	TP5	BH7	TP10
Depth		0.1-0.2	0.3-0.4	0-0.1
Date Sampled		1/08/2023	1/08/2023	2/08/2023
Type of sample		Soil	Soil	Soil
Date extracted	-	21/08/2023	21/08/2023	21/08/2023
Date analysed	-	21/08/2023	21/08/2023	21/08/2023
Lead	mg/L	<0.03	0.03	<0.03

Misc Inorg - Soil				
Our Reference		329662-A-13	329662-A-14	329662-A-19
Your Reference	UNITS	BH7	BH7	TP10
Depth		0-0.1	0.3-0.4	0-0.1
Date Sampled		1/08/2023	1/08/2023	2/08/2023
Type of sample		Soil	Soil	Soil
Date prepared	-	22/08/2023	22/08/2023	22/08/2023
Date analysed	-	22/08/2023	22/08/2023	22/08/2023
pH 1:5 soil:water	pH Units	6.2	7.6	7.4

CEC				
Our Reference		329662-A-13	329662-A-14	329662-A-19
Your Reference	UNITS	BH7	BH7	TP10
Depth		0-0.1	0.3-0.4	0-0.1
Date Sampled		1/08/2023	1/08/2023	2/08/2023
Type of sample		Soil	Soil	Soil
Date prepared	-	22/08/2023	22/08/2023	22/08/2023
Date analysed	-	22/08/2023	22/08/2023	22/08/2023
Exchangeable Ca	meq/100g	20	14	12
Exchangeable K	meq/100g	1.0	0.3	0.6
Exchangeable Mg	meq/100g	4.5	1.4	1.2
Exchangeable Na	meq/100g	0.5	0.1	0.2
Cation Exchange Capacity	meq/100g	26	16	14

svTRH (C10-C40) in Soil		
Our Reference		329662-A-14
Your Reference	UNITS	BH7
Depth		0.3-0.4
Date Sampled		1/08/2023
Type of sample		Soil
Date extracted	-	18/08/2023
Date analysed	-	22/08/2023
TRH C_{10} - C_{14}	mg/kg	<50
TRH C_{15} - C_{28}	mg/kg	<100
TRH C_{29} - C_{36}	mg/kg	<100
Total +ve TRH (C10-C36)	mg/kg	<50
TRH >C_{10} -C_{16}	mg/kg	<50
TRH >C_{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	%	79

sTPH in Soil (C10-C40)-Silica			
Our Reference		329662-A-14	329662-A-19
Your Reference	UNITS	BH7	TP10
Depth		0.3-0.4	0-0.1
Date Sampled		1/08/2023	2/08/2023
Type of sample		Soil	Soil
Date extracted	-	18/08/2023	18/08/2023
Date analysed	-	22/08/2023	22/08/2023
TPH C_{10} - C_{14}	mg/kg	<50	<50
TPH C_{15} - C_{28}	mg/kg	<100	480
TPH C_{29} - C_{36}	mg/kg	<100	700
TPH >C_{10} -C_{16}	mg/kg	<50	<50
TPH >C_{16} -C_{34}	mg/kg	<100	1,000
TPH >C_{34} -C_{40}	mg/kg	<100	430
Surrogate o-Terphenyl	%	80	97

Method ID	Methodology Summary
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using AS 4439. Please note that the mass used may be scaled down from default based on sample mass available. Samples are stored at 2-6oC before and after leachate preparation.
Metals-020	Determination of various metals by ICP-AES following buffer determination as per USEPA 1311 and hence AS 4439.3. Extraction Fluid 1 refers to the pH 5.0 buffer and Extraction Fluid 2 is the pH 2.9 buffer.
Metals-020	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-OES analytical finish.
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	Leachates are extracted with Dichloromethane and analysed by GC-MS/GC-MSMS.

QUALITY CONTROL: PAHs in TCLP (USEPA 1311)					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			18/08/2023	[NT]	[NT]	[NT]	[NT]	18/08/2023	[NT]
Date analysed	-			18/08/2023	[NT]	[NT]	[NT]	[NT]	18/08/2023	[NT]
Naphthalene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	99	[NT]
Acenaphthylene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	105	[NT]
Fluorene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	98	[NT]
Phenanthrene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	104	[NT]
Anthracene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	106	[NT]
Pyrene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	112	[NT]
Benzo(a)anthracene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	103	[NT]
Benzo(bjk)fluoranthene in TCLP	mg/L	0.002	Org-022/025	<0.002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	100	[NT]
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	96	[NT]	[NT]	[NT]	[NT]	85	[NT]

QUALITY CONTROL: Metals from Leaching Fluid pH 2.9 or 5					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	329662-A-14
Date extracted	-			21/08/2023	7	21/08/2023	21/08/2023		21/08/2023	21/08/2023
Date analysed	-			21/08/2023	7	21/08/2023	21/08/2023		21/08/2023	21/08/2023
Lead	mg/L	0.03	Metals-020	<0.03	7	<0.03	<0.03	0	103	126

QUALITY CONTROL: Misc Inorg - Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			22/08/2023	[NT]	[NT]	[NT]	[NT]	22/08/2023	[NT]
Date analysed	-			22/08/2023	[NT]	[NT]	[NT]	[NT]	22/08/2023	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	99	[NT]

QUALITY CONTROL: CEC					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			22/08/2023	[NT]	[NT]	[NT]	[NT]	22/08/2023	[NT]
Date analysed	-			22/08/2023	[NT]	[NT]	[NT]	[NT]	22/08/2023	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	115	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	118	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	
Date extracted	-			18/08/2023	14	18/08/2023	18/08/2023		18/08/2023	[NT]
Date analysed	-			22/08/2023	14	22/08/2023	22/08/2023		22/08/2023	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	14	<50	<50	0	103	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	14	<100	<100	0	91	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	14	<100	<100	0	83	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	14	<50	<50	0	103	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	14	<100	<100	0	91	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	14	<100	<100	0	83	[NT]
Surrogate o-Terphenyl	%		Org-020	94	14	79	91	14	106	[NT]

QUALITY CONTROL: sTPH in Soil (C10-C40)-Silica					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			18/08/2023	[NT]	[NT]	[NT]	[NT]	18/08/2023	[NT]
Date analysed	-			21/08/2023	[NT]	[NT]	[NT]	[NT]	21/08/2023	[NT]
TPH C_{10} - C_{14}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	101	[NT]
TPH C_{15} - C_{28}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	110	[NT]
TPH C_{29} - C_{36}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	116	[NT]
TPH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	101	[NT]
TPH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	110	[NT]
TPH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	116	[NT]
Surrogate o-Terphenyl	%		Org-020	69	[NT]	[NT]	[NT]	[NT]	89	[NT]

Result Definitions

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

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

Report Comments

Samples were out of the recommended holding time for this analysis pH in soil.

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

SAMPLE RECEIPT ADVICE

Client Details	
Client	JK Environments
Attention	Vittal Boggaram

Sample Login Details	
Your reference	E34303B, Potts Point
Envirolab Reference	329662-A
Date Sample Received	03/08/2023
Date Instructions Received	15/08/2023
Date Results Expected to be Reported	22/08/2023

Sample Condition	
Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	additional analysis
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	9
Cooling Method	Ice
Sampling Date Provided	YES

Comments
Nil

Please direct any queries to:

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

Analysis Underway, details on the following page:

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Sample ID	TCLP Preparation - Acid	Naphthalene in TCLP	Acenaphthylene in TCLP	Acenaphthene in TCLP	Fluorene in TCLP	Phenanthrene in TCLP	Anthracene in TCLP	Fluoranthene in TCLP	Pyrene in TCLP	Benzo(a)anthracene in TCLP	Chrysene in TCLP	Benzo(bjk)fluoranthene in TCLP	Benzo(a)pyrene in TCLP	Indeno(1,2,3-c,d)pyrene - TCLP	Dibenzo(a,h)anthracene in TCLP	Benzo(g,h,i)perylene in TCLP	Total +vePAH's	Surrogate p-Terphenyl-d14	Lead	Misc Inorg - Soil	CEC	sTPH in Soil (C10-C40)-Silica	On Hold
BH1-0.13-0.2																							✓
BH1-0.2-0.3																							✓
BH1-0.7-1.0																							✓
BH2-0.15-0.3																							✓
BH2-0.8-1.0																							✓
BH3-0.2-0.4																							✓
TP5-0.1-0.2	✓																		✓				
TP5-0.2-0.3																							✓
TP5-0.4-0.5																							✓
TP5-0.7-0.8																							✓
BH6-0.1-0.3																							✓
BH6-0.4-0.5																							✓
BH7-0-0.1																				✓	✓		
BH7-0.3-0.4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
BH8-0.1-0.2																							✓
BH8-0.3-0.5																							✓
BH9-0.12-0.2																							✓
BH9-0.2-0.35																							✓
TP10-0-0.1	✓																		✓	✓	✓	✓	
TP10-0.1-0.2																							✓

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Sample ID	TCLP Preparation - Acid	Naphthalene in TCLP	Acenaphthylene in TCLP	Acenaphthene in TCLP	Fluorene in TCLP	Phenanthrene in TCLP	Anthracene in TCLP	Fluoranthene in TCLP	Pyrene in TCLP	Benzo(a)anthracene in TCLP	Chrysene in TCLP	Benzo(bjk)fluoranthene in TCLP	Benzo(a)pyrene in TCLP	Indeno(1,2,3-c,d)pyrene - TCLP	Dibenzo(a,h)anthracene in TCLP	Benzo(g,h,i)perylene in TCLP	Total +vePAH's	Surrogate p-Terphenyl-d14	Lead	Misc Inorg - Soil	CEC	sTPH in Soil (C10-C40)-Silica	On Hold
SDUP1																							✓
SDUP2																							✓
SDUP3																							✓
TS-S1																							✓
TS-S2																							✓
TB-S1																							✓
TB-S2																							✓
FR1-SPT																							✓
FR2-HA																							✓

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

Additional Info

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

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

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

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

Ming To

From: Vittal Boggaram <VBoggaram@jkenvironments.com.au>
Sent: Tuesday, 15 August 2023 4:15 PM
To: Stuart Chen
Cc: Samplereceipt
Subject: Additional testing for Registration 329662 E34303B, Potts Point

Categories: Additional

Ref: 329662-A
TAT: Standard
Due: 22/08/2023
MT

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

Hi Stuart,

I would like to schedule the following additional testing on a standard turnaround. Thanks.

Sample Reference	Sample Depth	Additional Testing Request
TP5 7	0.1-0.2	TCLP Lead
BH7 13	0-0.1	pH and CEC
BH7 14	0.3-0.4	TCLP Lead, TCLP PAHs, pH, CEC, silica gel cleanup TRH F3
TP10 19	0-0.1	TCLP Lead, pH, CEC, silica gel cleanup TRH F3

Regards
Vittal Boggaram
Principal Associate | Environmental Scientist

T: +612 9888 5000
D: 0451 110 352
E: VBoggaram@jkenvironments.com.au
www.jkenvironments.com.au

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

JKEnvironments

From: Stuart Chen <SChen2@envirolab.com.au>
Sent: Friday, 11 August 2023 3:14 PM
To: Vittal Boggaram <VBoggaram@jkenvironments.com.au>
Subject: Results for Registration 329662 E34303B, Potts Point

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

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

Please note that a hard copy will not be posted.

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www.envirolab.com.au

CERTIFICATE OF ANALYSIS 329836

Client Details

Client	JK Environments
Attention	Vittal Boggaram
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**Detailed Site Investigation (DSI)**
Number of Samples	13 Air
Date samples received	07/08/2023
Date completed instructions received	07/08/2023

Analysis Details

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

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

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

Report Details

Date results requested by	14/08/2023
Date of Issue	14/08/2023

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

Results Approved By
Amanda Chui, Air Toxics Team Leader
Steven Luong, Senior Chemist

Authorised By
Nancy Zhang, Laboratory Manager

TO15 in Canisters/Bags						
Our Reference	UNITS	329836-1	329836-3	329836-5	329836-7	329836-9
Your Reference		SV1	SV2	SV3	SV4	SV5
Date Sampled		07/08/2023	07/08/2023	07/08/2023	07/08/2023	07/08/2023
Type of sample		Air	Air	Air	Air	Air
Air Kit Security No.		3506	3639	1871	2288	3290
Vacuum before Shipment	Hg"	-30	-30	-30	-30	-30
Vacuum before Analysis	Hg"	-3	-6	-3	-4	-5
Date prepared	-	08/08/2023	08/08/2023	08/08/2023	08/08/2023	08/08/2023
Date analysed	-	08/08/2023	08/08/2023	08/08/2023	08/08/2023	08/08/2023
Propylene	ppbv	1	2	<0.5	<0.5	<0.5
Dichlorodifluoromethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Chloromethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorotetrafluoroethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,3-Butadiene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Bromomethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Ethanol	ppbv	50	20	10	40	77
Acrolein	ppbv	<5	<5	<5	<5	<5
Trichlorofluoromethane (Freon 11)	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Acetone	ppbv	64	40	<5	10	30
Isopropyl Alcohol	ppbv	<5	<5	8	<5	210
1,1-Dichloroethene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichlorotrifluoroethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Methylene chloride (Dichloromethane)	ppbv	<5	<5	<5	<5	<5
Carbon Disulfide	ppbv	<5	<5	<5	<5	<5
trans-1,2-dichloroethene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
MTBE	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,1- Dichloroethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Vinyl Acetate	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
MEK	ppbv	<5	<5	<5	<5	<5
Hexane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Ethyl Acetate	ppbv	<0.5	<0.5	<0.5	<0.5	5.4
Chloroform	ppbv	0.6	0.5	2	<0.5	<0.5
Tetrahydrofuran	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Benzene	ppbv	0.6	<0.5	<0.5	<0.5	<0.5
Carbon tetrachloride	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5

TO15 in Canisters/Bags						
Our Reference		329836-1	329836-3	329836-5	329836-7	329836-9
Your Reference	UNITS	SV1	SV2	SV3	SV4	SV5
Date Sampled		07/08/2023	07/08/2023	07/08/2023	07/08/2023	07/08/2023
Type of sample		Air	Air	Air	Air	Air
Air Kit Security No.		3506	3639	1871	2288	3290
Cyclohexane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Heptane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethene	ppbv	<0.5	<0.5	<0.5	0.7	<0.5
1,2-Dichloropropane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dioxane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Methyl Methacrylate	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
MIBK	ppbv	<5	<5	<5	<5	<5
cis-1,3-Dichloropropene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	ppbv	3	1	0.7	<0.5	1
1,1,2-Trichloroethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Methyl Butyl Ketone	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dibromoethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Chlorobenzene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
m-& p-Xylene	ppbv	<1	<1	<1	<1	<1
Styrene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
o-Xylene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
4-ethyl toluene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,3,5-Trimethylbenzene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,2,4-Trimethylbenzene	ppbv	0.5	<0.5	<0.5	<0.5	0.9
1,3-Dichlorobenzene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Benzyl chloride	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,2,4-Trichlorobenzene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Hexachloro- 1,3-butadiene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate-Bromochloromethane	% rec	122	123	119	114	116
Surrogate -1,4-Difluorobenzene	% rec	127	128	123	118	121
Surrogate-Chlorobenzene-D5	% rec	118	118	115	110	113

TO15 in Canisters/Bags		
Our Reference		329836-11
Your Reference	UNITS	SVDUP1
Date Sampled		07/08/2023
Type of sample		Air
Air Kit Security No.		2274
Vacuum before Shipment	Hg"	-30
Vacuum before Analysis	Hg"	-4
Date prepared	-	08/08/2023
Date analysed	-	08/08/2023
Propylene	ppbv	<0.5
Dichlorodifluoromethane	ppbv	<0.5
Chloromethane	ppbv	<0.5
1,2-Dichlorotetrafluoroethane	ppbv	<0.5
Vinyl chloride	ppbv	<0.5
1,3-Butadiene	ppbv	<0.5
Bromomethane	ppbv	<0.5
Chloroethane	ppbv	<0.5
Ethanol	ppbv	79
Acrolein	ppbv	<5
Trichlorofluoromethane (Freon 11)	ppbv	<0.5
Acetone	ppbv	20
Isopropyl Alcohol	ppbv	6
1,1-Dichloroethene	ppbv	<0.5
1,1,2-Trichlorotrifluoroethane	ppbv	<0.5
Methylene chloride (Dichloromethane)	ppbv	<5
Carbon Disulfide	ppbv	<5
trans-1,2-dichloroethene	ppbv	<0.5
MTBE	ppbv	<0.5
1,1- Dichloroethane	ppbv	<0.5
Vinyl Acetate	ppbv	<0.5
MEK	ppbv	<5
Hexane	ppbv	<0.5
cis-1,2-Dichloroethene	ppbv	<0.5
Ethyl Acetate	ppbv	<0.5
Chloroform	ppbv	<0.5
Tetrahydrofuran	ppbv	<0.5
1,1,1-Trichloroethane	ppbv	<0.5
1,2-Dichloroethane	ppbv	<0.5
Benzene	ppbv	<0.5
Carbon tetrachloride	ppbv	<0.5

TO15 in Canisters/Bags		
Our Reference		329836-11
Your Reference	UNITS	SVDUP1
Date Sampled		07/08/2023
Type of sample		Air
Air Kit Security No.		2274
Cyclohexane	ppbv	<0.5
Heptane	ppbv	<0.5
Trichloroethene	ppbv	<0.5
1,2-Dichloropropane	ppbv	<0.5
1,4-Dioxane	ppbv	<0.5
Bromodichloromethane	ppbv	<0.5
Methyl Methacrylate	ppbv	<0.5
MIBK	ppbv	<5
cis-1,3-Dichloropropene	ppbv	<0.5
trans-1,3-Dichloropropene	ppbv	<0.5
Toluene	ppbv	<0.5
1,1,2-Trichloroethane	ppbv	<0.5
Methyl Butyl Ketone	ppbv	<0.5
Dibromochloromethane	ppbv	<0.5
Tetrachloroethene	ppbv	<0.5
1,2-Dibromoethane	ppbv	<0.5
Chlorobenzene	ppbv	<0.5
Ethylbenzene	ppbv	<0.5
m-& p-Xylene	ppbv	<1
Styrene	ppbv	<0.5
o-Xylene	ppbv	<0.5
Bromoform	ppbv	<0.5
1,1,2,2-Tetrachloroethane	ppbv	<0.5
4-ethyl toluene	ppbv	<0.5
1,3,5-Trimethylbenzene	ppbv	<0.5
1,2,4-Trimethylbenzene	ppbv	<0.5
1,3-Dichlorobenzene	ppbv	<0.5
Benzyl chloride	ppbv	<0.5
1,4-Dichlorobenzene	ppbv	<0.5
1,2-Dichlorobenzene	ppbv	<0.5
1,2,4-Trichlorobenzene	ppbv	<0.5
Naphthalene	ppbv	<0.5
Hexachloro- 1,3-butadiene	ppbv	<0.5
Surrogate-Bromochloromethane	% rec	119
Surrogate -1,4-Difluorobenzene	% rec	127
Surrogate-Chlorobenzene-D5	% rec	117

TO15 in Canisters µg/m3						
Our Reference		329836-1	329836-3	329836-5	329836-7	329836-9
Your Reference	UNITS	SV1	SV2	SV3	SV4	SV5
Date Sampled		07/08/2023	07/08/2023	07/08/2023	07/08/2023	07/08/2023
Type of sample		Air	Air	Air	Air	Air
Air Kit Security No.		3506	3639	1871	2288	3290
Vacuum before Shipment	Hg"	-30	-30	-30	-30	-30
Vacuum before Analysis	Hg"	-3	-6	-3	-4	-5
Date prepared	-	08/08/2023	08/08/2023	08/08/2023	08/08/2023	08/08/2023
Date analysed	-	08/08/2023	08/08/2023	08/08/2023	08/08/2023	08/08/2023
Propylene	µg/m^3	2	3	<0.9	<0.9	<0.9
Dichlorodifluoromethane	µg/m^3	<2.5	<2.5	<2.5	<2.5	<2.5
Chloromethane	µg/m^3	<1	<1	<1	<1	<1
1,2-Dichlorotetrafluoroethane	µg/m^3	<2.5	<2.5	<2.5	<2.5	<2.5
Vinyl chloride	µg/m^3	<1.3	<1.3	<1.3	<1.3	<1.3
1,3-Butadiene	µg/m^3	<1.1	<1.1	<1.1	<1.1	<1.1
Bromomethane	µg/m^3	<1.9	<1.9	<1.9	<1.9	<1.9
Chloroethane	µg/m^3	<1.3	<1.3	<1.3	<1.3	<1.3
Ethanol	µg/m^3	90	40	30	80	150
Acrolein	µg/m^3	<11	<11	<11	<11	<11
Trichlorofluoromethane (Freon 11)	µg/m^3	<2.8	<2.8	<2.8	<2.8	<2.8
Acetone	µg/m^3	150	100	<11.9	30	60
Isopropyl Alcohol	µg/m^3	<12	<12	20	<12	510
1,1-Dichloroethene	µg/m^3	<2	<2	<2	<2	<2
1,1,2-Trichlorotrifluoroethane	µg/m^3	<3.8	<3.8	<3.8	<3.8	<3.8
Methylene chloride (Dichloromethane)	µg/m^3	<17	<17	<17	<17	<17
Carbon Disulfide	µg/m^3	<16	<16	<16	<16	<16
trans-1,2-dichloroethene	µg/m^3	<2	<2	<2	<2	<2
MTBE	µg/m^3	<1.8	<1.8	<1.8	<1.8	<1.8
1,1- Dichloroethane	µg/m^3	<2	<2	<2	<2	<2
Vinyl Acetate	µg/m^3	<1.8	<1.8	<1.8	<1.8	<1.8
MEK	µg/m^3	<15	<15	<15	<15	<15
Hexane	µg/m^3	<1.8	<1.8	<1.8	<1.8	<1.8
cis-1,2-Dichloroethene	µg/m^3	<2	<2	<2	<2	<2.0
Ethyl Acetate	µg/m^3	<1.8	<1.8	<1.8	<1.8	20
Chloroform	µg/m^3	3	3	8	<2.4	<2.4
Tetrahydrofuran	µg/m^3	<1.5	<1.5	<1.5	<1.5	<1.5
1,1,1-Trichloroethane	µg/m^3	<2.7	<2.7	<2.7	<2.7	<2.7
1,2-Dichloroethane	µg/m^3	<2	<2	<2	<2	<2
Benzene	µg/m^3	2	<1.6	<1.6	<1.6	<1.6
Carbon tetrachloride	µg/m^3	<3.1	<3.1	<3.1	<3.1	<3.1

TO15 in Canisters µg/m3						
Our Reference		329836-1	329836-3	329836-5	329836-7	329836-9
Your Reference	UNITS	SV1	SV2	SV3	SV4	SV5
Date Sampled		07/08/2023	07/08/2023	07/08/2023	07/08/2023	07/08/2023
Type of sample		Air	Air	Air	Air	Air
Air Kit Security No.		3506	3639	1871	2288	3290
Cyclohexane	µg/m^3	<1.7	<1.7	<1.7	<1.7	<1.7
Heptane	µg/m^3	<2	<2	<2	<2	<2
Trichloroethene	µg/m^3	<2.7	<2.7	<2.7	4	<2.7
1,2-Dichloropropane	µg/m^3	<2.3	<2.3	<2.3	<2.3	<2.3
1,4-Dioxane	µg/m^3	<1.8	<1.8	<1.8	<1.8	<1.8
Bromodichloromethane	µg/m^3	<3.4	<3.4	<3.4	<3.4	<3.4
Methyl Methacrylate	µg/m^3	<2	<2	<2	<2	<2
MIBK	µg/m^3	<20	<20	<20	<20	<20
cis-1,3-Dichloropropene	µg/m^3	<2.3	<2.3	<2.3	<2.3	<2.3
trans-1,3-Dichloropropene	µg/m^3	<2.3	<2.3	<2.3	<2.3	<2.3
Toluene	µg/m^3	10	5	3	<1.9	5
1,1,2-Trichloroethane	µg/m^3	<2.7	<2.7	<2.7	<2.7	<2.7
Methyl Butyl Ketone	µg/m^3	<2	<2	<2	<2	<2
Dibromochloromethane	µg/m^3	<1.6	<1.6	<1.6	<1.6	<1.6
Tetrachloroethene	µg/m^3	<3.4	<3.4	<3.4	<3.4	<3.4
1,2-Dibromoethane	µg/m^3	<3.8	<3.8	<3.8	<3.8	<3.8
Chlorobenzene	µg/m^3	<2.3	<2.3	<2.3	<2.3	<2.3
Ethylbenzene	µg/m^3	<2.2	<2.2	<2.2	<2.2	<2.2
m-& p-Xylene	µg/m^3	<4.3	<4.3	<4.3	<4.3	<4.3
Styrene	µg/m^3	<2.1	<2.1	<2.1	<2.1	<2.1
o-Xylene	µg/m^3	<2.2	<2.2	<2.2	<2.2	<2.2
Bromoform	µg/m^3	<5.2	<5.2	<5.2	<5.2	<5.2
1,1,2,2-Tetrachloroethane	µg/m^3	<3.4	<3.4	<3.4	<3.4	<3.4
4-ethyl toluene	µg/m^3	<2.5	<2.5	<2.5	<2.5	<2.5
1,3,5-Trimethylbenzene	µg/m^3	<2.5	<2.5	<2.5	<2.5	<2.5
1,2,4-Trimethylbenzene	µg/m^3	3	<2.5	<2.5	<2.5	4
1,3-Dichlorobenzene	µg/m^3	<3	<3	<3	<3	<3
Benzyl chloride	µg/m^3	<2.6	<2.6	<2.6	<2.6	<2.6
1,4-Dichlorobenzene	µg/m^3	<3	<3	<3	<3	<3
1,2-Dichlorobenzene	µg/m^3	<3	<3	<3	<3	<3
1,2,4-Trichlorobenzene	µg/m^3	<3.7	<3.7	<3.7	<3.7	<3.7
Naphthalene	µg/m^3	<2.6	<2.6	<2.6	<2.6	<2.6
Hexachloro- 1,3-butadiene	µg/m^3	<5.3	<5.3	<5.3	<5.3	<5.3
Surrogate-Bromochloromethane	% rec	122	123	119	114	116
Surrogate -1,4-Difluorobenzene	% rec	127	128	123	118	121
Surrogate-Chlorobenzene-D5	% rec	118	118	115	110	113

TO15 in Canisters µg/m3		
Our Reference		329836-11
Your Reference	UNITS	SVDUP1
Date Sampled		07/08/2023
Type of sample		Air
Air Kit Security No.		2274
Vacuum before Shipment	Hg"	-30
Vacuum before Analysis	Hg"	-4
Date prepared	-	08/08/2023
Date analysed	-	08/08/2023
Propylene	µg/m^3	<0.9
Dichlorodifluoromethane	µg/m^3	<2.5
Chloromethane	µg/m^3	<1
1,2-Dichlorotetrafluoroethane	µg/m^3	<2.5
Vinyl chloride	µg/m^3	<1.3
1,3-Butadiene	µg/m^3	<1.1
Bromomethane	µg/m^3	<1.9
Chloroethane	µg/m^3	<1.3
Ethanol	µg/m^3	150
Acrolein	µg/m^3	<11
Trichlorofluoromethane (Freon 11)	µg/m^3	<2.8
Acetone	µg/m^3	40
Isopropyl Alcohol	µg/m^3	10
1,1-Dichloroethene	µg/m^3	<2
1,1,2-Trichlorotrifluoroethane	µg/m^3	<3.8
Methylene chloride (Dichloromethane)	µg/m^3	<17
Carbon Disulfide	µg/m^3	<16
trans-1,2-dichloroethene	µg/m^3	<2
MTBE	µg/m^3	<1.8
1,1- Dichloroethane	µg/m^3	<2
Vinyl Acetate	µg/m^3	<1.8
MEK	µg/m^3	<15
Hexane	µg/m^3	<1.8
cis-1,2-Dichloroethene	µg/m^3	<2
Ethyl Acetate	µg/m^3	<1.8
Chloroform	µg/m^3	<2.4
Tetrahydrofuran	µg/m^3	<1.5
1,1,1-Trichloroethane	µg/m^3	<2.7
1,2-Dichloroethane	µg/m^3	<2
Benzene	µg/m^3	<1.6
Carbon tetrachloride	µg/m^3	<3.1

TO15 in Canisters µg/m3		
Our Reference		329836-11
Your Reference	UNITS	SVDUP1
Date Sampled		07/08/2023
Type of sample		Air
Air Kit Security No.		2274
Cyclohexane	µg/m³	<1.7
Heptane	µg/m³	<2
Trichloroethene	µg/m³	<2.7
1,2-Dichloropropane	µg/m³	<2.3
1,4-Dioxane	µg/m³	<1.8
Bromodichloromethane	µg/m³	<3.4
Methyl Methacrylate	µg/m³	<2
MIBK	µg/m³	<20
cis-1,3-Dichloropropene	µg/m³	<2.3
trans-1,3-Dichloropropene	µg/m³	<2.3
Toluene	µg/m³	<1.9
1,1,2-Trichloroethane	µg/m³	<2.7
Methyl Butyl Ketone	µg/m³	<2
Dibromochloromethane	µg/m³	<1.6
Tetrachloroethene	µg/m³	<3.4
1,2-Dibromoethane	µg/m³	<3.8
Chlorobenzene	µg/m³	<2.3
Ethylbenzene	µg/m³	<2.2
m-& p-Xylene	µg/m³	<4.3
Styrene	µg/m³	<2.1
o-Xylene	µg/m³	<2.2
Bromoform	µg/m³	<5.2
1,1,2,2-Tetrachloroethane	µg/m³	<3.4
4-ethyl toluene	µg/m³	<2.5
1,3,5-Trimethylbenzene	µg/m³	<2.5
1,2,4-Trimethylbenzene	µg/m³	<2.5
1,3-Dichlorobenzene	µg/m³	<3
Benzyl chloride	µg/m³	<2.6
1,4-Dichlorobenzene	µg/m³	<3
1,2-Dichlorobenzene	µg/m³	<3
1,2,4-Trichlorobenzene	µg/m³	<3.7
Naphthalene	µg/m³	<2.6
Hexachloro- 1,3-butadiene	µg/m³	<5.3
Surrogate-Bromochloromethane	% rec	119
Surrogate -1,4-Difluorobenzene	% rec	127
Surrogate-Chlorobenzene-D5	% rec	117

TPH Air/ Air Phase Hydrocarbon						
Our Reference		329836-1	329836-3	329836-5	329836-7	329836-9
Your Reference	UNITS	SV1	SV2	SV3	SV4	SV5
Date Sampled		07/08/2023	07/08/2023	07/08/2023	07/08/2023	07/08/2023
Type of sample		Air	Air	Air	Air	Air
Air Kit Security No.		3506	3639	1871	2288	3290
Date prepared	-	08/08/2023	08/08/2023	08/08/2023	08/08/2023	08/08/2023
Date analysed	-	08/08/2023	08/08/2023	08/08/2023	08/08/2023	08/08/2023
TPH C_5 - C_8 Aliphatic	µg/m^3	<200	<200	<200	<200	350
TPH C_9 - C_{12} Aliphatic	µg/m^3	<50	<50	<50	<50	150
TPH C_9 - C_{10} Aromatic	µg/m^3	<100	<100	<100	<100	<100
TPH C_6 - C_{10} - BTEX (F1)	µg/m^3	<200	<200	<200	<200	<200
TPH >C_{10} - C_{12} - Naphthalene (F2)	µg/m^3	<40	<40	<40	<40	140

TPH Air/ Air Phase Hydrocarbon		
Our Reference		329836-11
Your Reference	UNITS	SVDUP1
Date Sampled		07/08/2023
Type of sample		Air
Air Kit Security No.		2274
Date prepared	-	08/08/2023
Date analysed	-	08/08/2023
TPH C_5 - C_8 Aliphatic	µg/m^3	<200
TPH C_9 - C_{12} Aliphatic	µg/m^3	<50
TPH C_9 - C_{10} Aromatic	µg/m^3	<100
TPH C_6 - C_{10} - BTEX (F1)	µg/m^3	<200
TPH >C_{10} - C_{12} - Naphthalene (F2)	µg/m^3	40

VOC in Carbon tubes & Badges		
Our Reference		329836-13
Your Reference	UNITS	Shroud
Date Sampled		07/08/2023
Type of sample		Air
Air Kit Security No.		0171504433
Date extracted	-	11/08/2023
Date analysed	-	14/08/2023
Isopropyl Alcohol*	µg	40
Surrogate Toluene-d8	%	113
Surrogate 4-Bromofluorobenzene	%	79

VOC in Carbon tubes		
Our Reference		329836-13
Your Reference	UNITS	Shroud
Date Sampled		07/08/2023
Type of sample		Air
Air Kit Security No.		0171504433
Date prepared	-	11/08/2023
Date analysed	-	14/08/2023
Tube Sampling rate	mL/min	50
Tube Sampling Time	mins	1.0
Volume sampled	m^3	0.000050
Isopropyl Alcohol*	$\mu g/m^3$	860,000.0

Method ID	Methodology Summary
AT-005	Measurement of Air-Phase Petroleum Hydrocarbons and Ozone Precursors by GC-MS.
ORG-022	Determination of volatile organic compounds in charcoal tubes/badges/sorbents using CS2 extraction, determined by GC/GC-MS. Desorption efficiencies are not applied to results. Note where µg/m^3 results are supplied for SKC badges, the factors used are for 575-001, if 575-001 data is unavailable for an analyte then use 575-002 then 575-003 (exposure time must be supplied). Otherwise a sampling rate may be used for a similar analyte on request. Analytes such as (where applicable) Iodomethane, Chloroprene, Nitrobenzene, Naphthalene and 1, 2, 3 // 1, 2, 4 Trichlorobenzenes are considered to be semi-quant analyses using CS2 desorption from charcoal tubes. The latter three compounds are better served by XAD-2 collection and analysis. Note - air volume measurements are not covered by Envirolab's NATA accreditation.
TO15	USEPA TO15 - Analysis of VOC's in air using USEPA TO15 and in house method AT-002. Note, longer term stability of some oxygenated compounds is questionable where significant humidity is present.
USEPA 18	Measurement of Gaseous Organic Compound Emissions by Gas Chromatography using USEPA m18.

QUALITY CONTROL: TO15 in Canisters/Bags						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Vacuum before Shipment	Hg"			[NT]	1	-30	-30	0	[NT]	[NT]
Vacuum before Analysis	Hg"			[NT]	1	-3	-3	0	[NT]	[NT]
Date prepared	-			08/08/2023	1	08/08/2023	08/08/2023		08/08/2023	[NT]
Date analysed	-			08/08/2023	1	08/08/2023	08/08/2023		08/08/2023	[NT]
Propylene	ppbv	0.5	TO15	<0.5	1	1	1	0	118	[NT]
Dichlorodifluoromethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Chloromethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,2-Dichlorotetrafluoroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Vinyl chloride	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,3-Butadiene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Bromomethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Chloroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Ethanol	ppbv	5	TO15	<5	1	50	50	0	[NT]	[NT]
Acrolein	ppbv	5	TO15	<5	1	<5	<5	0	[NT]	[NT]
Trichlorofluoromethane (Freon 11)	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Acetone	ppbv	5	TO15	<5	1	64	64	0	[NT]	[NT]
Isopropyl Alcohol	ppbv	5	TO15	<5	1	<5	5	0	[NT]	[NT]
1,1-Dichloroethene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,1,2-Trichlorotrifluoroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Methylene chloride (Dichloromethane)	ppbv	5	TO15	<5	1	<5	<5	0	[NT]	[NT]
Carbon Disulfide	ppbv	5	TO15	<5	1	<5	<5	0	[NT]	[NT]
trans-1,2-dichloroethene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
MTBE	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,1- Dichloroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Vinyl Acetate	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
MEK	ppbv	5	TO15	<5	1	<5	<5	0	[NT]	[NT]
Hexane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	99	[NT]
cis-1,2-Dichloroethene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Ethyl Acetate	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Chloroform	ppbv	0.5	TO15	<0.5	1	0.6	0.6	0	[NT]	[NT]
Tetrahydrofuran	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,1,1-Trichloroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,2-Dichloroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Benzene	ppbv	0.5	TO15	<0.5	1	0.6	0.6	0	110	[NT]
Carbon tetrachloride	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Cyclohexane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	78	[NT]
Heptane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	102	[NT]

QUALITY CONTROL: TO15 in Canisters/Bags						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Trichloroethene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,2-Dichloropropane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,4-Dioxane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Bromodichloromethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Methyl Methacrylate	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
MIBK	ppbv	5	TO15	<5	1	<5	<5	0	[NT]	[NT]
cis-1,3-Dichloropropene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
trans-1,3-Dichloropropene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Toluene	ppbv	0.5	TO15	<0.5	1	3	3	0	106	[NT]
1,1,2-Trichloroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Methyl Butyl Ketone	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Dibromochloromethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Tetrachloroethene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,2-Dibromoethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Chlorobenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	113	[NT]
m-& p-Xylene	ppbv	1	TO15	<1	1	<1	<1	0	110	[NT]
Styrene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
o-Xylene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	107	[NT]
Bromoform	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,1,2,2-Tetrachloroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
4-ethyl toluene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	120	[NT]
1,3,5-Trimethylbenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	111	[NT]
1,2,4-Trimethylbenzene	ppbv	0.5	TO15	<0.5	1	0.5	0.5	0	122	[NT]
1,3-Dichlorobenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Benzyl chloride	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,4-Dichlorobenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,2-Dichlorobenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,2,4-Trichlorobenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Naphthalene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Hexachloro- 1,3-butadiene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Surrogate-Bromochloromethane	% rec		TO15	97	1	122	124	2	114	[NT]
Surrogate -1,4-Difluorobenzene	% rec		TO15	93	1	127	129	2	115	[NT]
Surrogate-Chlorobenzene-D5	% rec		TO15	89	1	118	120	2	110	[NT]

QUALITY CONTROL: TO15 in Canisters µg/m3					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Vacuum before Shipment	Hg"			[NT]	1	-30	-30	0	[NT]	[NT]
Vacuum before Analysis	Hg"			[NT]	1	-3	-3	0	[NT]	[NT]
Date prepared	-			08/08/2023	1	08/08/2023	08/08/2023		[NT]	[NT]
Date analysed	-			08/08/2023	1	08/08/2023	08/08/2023		[NT]	[NT]
Propylene	µg/m³	0.9	TO15	<0.9	1	2	2	0	[NT]	[NT]
Dichlorodifluoromethane	µg/m³	2.5	TO15	<2.5	1	<2.5	<2.5	0	[NT]	[NT]
Chloromethane	µg/m³	1.0	TO15	<1.0	1	<1	<1	0	[NT]	[NT]
1,2-Dichlorotetrafluoroethane	µg/m³	2.5	TO15	<2.5	1	<2.5	<2.5	0	[NT]	[NT]
Vinyl chloride	µg/m³	1.3	TO15	<1.3	1	<1.3	<1.3	0	[NT]	[NT]
1,3-Butadiene	µg/m³	1.1	TO15	<1.1	1	<1.1	<1.1	0	[NT]	[NT]
Bromomethane	µg/m³	1.9	TO15	<1.9	1	<1.9	<1.9	0	[NT]	[NT]
Chloroethane	µg/m³	1.3	TO15	<1.3	1	<1.3	<1.3	0	[NT]	[NT]
Ethanol	µg/m³	9	TO15	<9	1	90	91	1	[NT]	[NT]
Acrolein	µg/m³	11	TO15	<11	1	<11	<11	0	[NT]	[NT]
Trichlorofluoromethane (Freon 11)	µg/m³	2.8	TO15	<2.8	1	<2.8	<2.8	0	[NT]	[NT]
Acetone	µg/m³	11.9	TO15	<11.9	1	150	150	0	[NT]	[NT]
Isopropyl Alcohol	µg/m³	12	TO15	<12	1	<12	10	18	[NT]	[NT]
1,1-Dichloroethene	µg/m³	2.0	TO15	<2.0	1	<2	<2	0	[NT]	[NT]
1,1,2-Trichlorotrifluoroethane	µg/m³	3.8	TO15	<3.8	1	<3.8	<3.8	0	[NT]	[NT]
Methylene chloride (Dichloromethane)	µg/m³	17	USEPA 18	<17	1	<17	<17	0	[NT]	[NT]
Carbon Disulfide	µg/m³	16	TO15	<16	1	<16	<16	0	[NT]	[NT]
trans-1,2-dichloroethene	µg/m³	2.0	TO15	<2.0	1	<2	<2	0	[NT]	[NT]
MTBE	µg/m³	1.8	TO15	<1.8	1	<1.8	<1.8	0	[NT]	[NT]
1,1- Dichloroethane	µg/m³	2.0	TO15	<2.0	1	<2	<2	0	[NT]	[NT]
Vinyl Acetate	µg/m³	1.8	TO15	<1.8	1	<1.8	<1.8	0	[NT]	[NT]
MEK	µg/m³	15	TO15	<15	1	<15	<15	0	[NT]	[NT]
Hexane	µg/m³	1.8	TO15	<1.8	1	<1.8	<1.8	0	[NT]	[NT]
cis-1,2-Dichloroethene	µg/m³	2.0	TO15	<2.0	1	<2	<2	0	[NT]	[NT]
Ethyl Acetate	µg/m³	1.8	TO15	<1.8	1	<1.8	<1.8	0	[NT]	[NT]
Chloroform	µg/m³	2.4	TO15	<2.4	1	3	3	0	[NT]	[NT]
Tetrahydrofuran	µg/m³	1.5	TO15	<1.5	1	<1.5	<1.5	0	[NT]	[NT]
1,1,1-Trichloroethane	µg/m³	2.7	TO15	<2.7	1	<2.7	<2.7	0	[NT]	[NT]
1,2-Dichloroethane	µg/m³	2.0	TO15	<2.0	1	<2	<2	0	[NT]	[NT]
Benzene	µg/m³	1.6	TO15	<1.6	1	2	2	0	[NT]	[NT]
Carbon tetrachloride	µg/m³	3.1	TO15	<3.1	1	<3.1	<3.1	0	[NT]	[NT]
Cyclohexane	µg/m³	1.7	TO15	<1.7	1	<1.7	<1.7	0	[NT]	[NT]
Heptane	µg/m³	2.0	TO15	<2.0	1	<2	<2	0	[NT]	[NT]

QUALITY CONTROL: TO15 in Canisters µg/m3						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Trichloroethene	µg/m³	2.7	TO15	<2.7	1	<2.7	<2.7	0	[NT]	[NT]
1,2-Dichloropropane	µg/m³	2.3	TO15	<2.3	1	<2.3	<2.3	0	[NT]	[NT]
1,4-Dioxane	µg/m³	1.8	TO15	<1.8	1	<1.8	<1.8	0	[NT]	[NT]
Bromodichloromethane	µg/m³	3.4	TO15	<3.4	1	<3.4	<3.4	0	[NT]	[NT]
Methyl Methacrylate	µg/m³	2.0	TO15	<2.0	1	<2	<2	0	[NT]	[NT]
MIBK	µg/m³	20	TO15	<20	1	<20	<20	0	[NT]	[NT]
cis-1,3-Dichloropropene	µg/m³	2.3	TO15	<2.3	1	<2.3	<2.3	0	[NT]	[NT]
trans-1,3-Dichloropropene	µg/m³	2.3	TO15	<2.3	1	<2.3	<2.3	0	[NT]	[NT]
Toluene	µg/m³	1.9	TO15	<1.9	1	10	10	0	[NT]	[NT]
1,1,2-Trichloroethane	µg/m³	2.7	TO15	<2.7	1	<2.7	<2.7	0	[NT]	[NT]
Methyl Butyl Ketone	µg/m³	2.0	TO15	<2.0	1	<2	<2	0	[NT]	[NT]
Dibromochloromethane	µg/m³	1.6	TO15	<1.6	1	<1.6	<1.6	0	[NT]	[NT]
Tetrachloroethene	µg/m³	3.4	TO15	<3.4	1	<3.4	<3.4	0	[NT]	[NT]
1,2-Dibromoethane	µg/m³	3.8	TO15	<3.8	1	<3.8	<3.8	0	[NT]	[NT]
Chlorobenzene	µg/m³	2.3	TO15	<2.3	1	<2.3	<2.3	0	[NT]	[NT]
Ethylbenzene	µg/m³	2.2	TO15	<2.2	1	<2.2	<2.2	0	[NT]	[NT]
m-& p-Xylene	µg/m³	4.3	TO15	<4.3	1	<4.3	<4.3	0	[NT]	[NT]
Styrene	µg/m³	2.1	TO15	<2.1	1	<2.1	<2.1	0	[NT]	[NT]
o-Xylene	µg/m³	2.2	TO15	<2.2	1	<2.2	<2.2	0	[NT]	[NT]
Bromoform	µg/m³	5.2	TO15	<5.2	1	<5.2	<5.2	0	[NT]	[NT]
1,1,2,2-Tetrachloroethane	µg/m³	3.4	TO15	<3.4	1	<3.4	<3.4	0	[NT]	[NT]
4-ethyl toluene	µg/m³	2.5	TO15	<2.5	1	<2.5	<2.5	0	[NT]	[NT]
1,3,5-Trimethylbenzene	µg/m³	2.5	TO15	<2.5	1	<2.5	<2.5	0	[NT]	[NT]
1,2,4-Trimethylbenzene	µg/m³	2.5	TO15	<2.5	1	3	3	0	[NT]	[NT]
1,3-Dichlorobenzene	µg/m³	3.0	TO15	<3.0	1	<3	<3	0	[NT]	[NT]
Benzyl chloride	µg/m³	2.6	TO15	<2.6	1	<2.6	<2.6	0	[NT]	[NT]
1,4-Dichlorobenzene	µg/m³	3.0	TO15	<3.0	1	<3	<3	0	[NT]	[NT]
1,2-Dichlorobenzene	µg/m³	3.0	TO15	<3.0	1	<3	<3	0	[NT]	[NT]
1,2,4-Trichlorobenzene	µg/m³	3.7	TO15	<3.7	1	<3.7	<3.7	0	[NT]	[NT]
Naphthalene	µg/m³	2.6	TO15	<2.6	1	<2.6	<2.6	0	[NT]	[NT]
Hexachloro- 1,3-butadiene	µg/m³	5.3	TO15	<5.3	1	<5.3	<5.3	0	[NT]	[NT]
Surrogate-Bromochloromethane	% rec		TO15	97	1	122	124	2	[NT]	[NT]
Surrogate -1,4-Difluorobenzene	% rec		TO15	93	1	127	129	2	[NT]	[NT]
Surrogate-Chlorobenzene-D5	% rec		TO15	89	1	118	120	2	[NT]	[NT]

QUALITY CONTROL: TPH Air/ Air Phase Hydrocarbon					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			08/08/2023	1	08/08/2023	08/08/2023		08/08/2023	[NT]
Date analysed	-			08/08/2023	1	08/08/2023	08/08/2023		08/08/2023	[NT]
TPH C_5 - C_8 Aliphatic	µg/m³	200	AT-005	<200	1	<200	<200	0	117	[NT]
TPH C_9 - C_{12} Aliphatic	µg/m³	50	AT-005	<50	1	<50	<50	0	[NT]	[NT]
TPH C_9 - C_{10} Aromatic	µg/m³	100	AT-005	<100	1	<100	<100	0	109	[NT]
TPH C_6 - C_{10} - BTEX (F1)	µg/m³	200	TO15	<200	1	<200	<200	0	108	[NT]
TPH >C_{10} - C_{12} - Naphthalene (F2)	µg/m³	40	TO15	<40	1	<40	<40	0	106	[NT]

QUALITY CONTROL: VOC in Carbon tubes & Badges					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			11/08/2023	[NT]	[NT]	[NT]	[NT]	11/08/2023	[NT]
Date analysed	-			14/08/2023	[NT]	[NT]	[NT]	[NT]	14/08/2023	[NT]
Isopropyl Alcohol*	µg	5	ORG-022	<5	[NT]	[NT]	[NT]	[NT]	96	[NT]
Surrogate Toluene-d8	%		ORG-022	99	[NT]	[NT]	[NT]	[NT]	102	[NT]
Surrogate 4-Bromofluorobenzene	%		ORG-022	111	[NT]	[NT]	[NT]	[NT]	99	[NT]

Result Definitions

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

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

Envirolab Services Pty Ltd
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12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
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SAMPLE RECEIPT ADVICE

Client Details	
Client	JK Environments
Attention	Vittal Boggaram

Sample Login Details	
Your reference	Detailed Site Investigation (DSI)
Envirolab Reference	329836
Date Sample Received	07/08/2023
Date Instructions Received	07/08/2023
Date Results Expected to be Reported	14/08/2023

Sample Condition	
Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	13 Air
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	n/a
Cooling Method	Not applicable
Sampling Date Provided	YES

Comments
Nil

Please direct any queries to:

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

Analysis Underway, details on the following page:

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Sample ID	TO15 in Canisters/Bags	TO15 in Canisters µg/m3	TPH Air/ Air Phase Hydrocarbon	VOC in Carbon tubes & Badges	VOC in Carbon tubes	On Hold
SV1	✓	✓	✓			
SV1						✓
SV2	✓	✓	✓			
SV2						✓
SV3	✓	✓	✓			
SV3						✓
SV4	✓	✓	✓			
SV4						✓
SV5	✓	✓	✓			
SV5						✓
SVDUP1	✓	✓	✓			
SVDUP1						✓
Shroud				✓	✓	

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

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

ENVIROLAB ENVIROLAB SERVICES mpl

CHAIN OF COUSTODY - CANISTERS / BAGS / TD TUBES

ENVIROLAB GROUP
National phone number 1300 424 344

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07 3266 9532 | brisbane@envirolab.com.au

Darwin Office - Envirolab Services
Unit 20/119 Reichardt Road, Winnellie, NT 0820

Client: JK Environments (JKE)	Client Project Name / Number / Site etc. (i.e. report title): Detailed Site Investigation (DSI)
Contact Person: Vittal Boggaram	
Project Mgr: Vittal Boggaram	PO No.: E34303B Potts Point
Sampler: Harley Wang	Envirolab Quote No. :
Address: 115 Wicks Road, Macquarie Park, NSW	Date results required: standard *Note: Inform lab in advance if urgent turnaround is required - surcharges apply*
Phone: 9888 5000 Mob:	Additional report format: esdat / equis /
Email: vboggaram@jkenvironments.com.au	Lab Comments:

Sample Information												Tests Required								Back-up Tube ID
Envirolab Sample ID	Client Sample ID (Field Location)	Canister / TD Tube #	Soil Gas Train / Mass Flow Controller #	Leak Test Passed (Y/N)	PID Reading (ppmv)	Date of Collection	Collection Time: Time On	Collection Time: Time Off	Canister Vacuum (Hg"): Initial	Canister Vacuum (Hg"): Final	Purged Volume (mL)	TO-15 (Cans)	TRH (F1 & F2)	IPA						
1,2	SV1	3506	1744	Y	0.4	4/08/2023	10:38am	10:55am	-30Hg"	-6Hg"	300mL	X	X							0171504430
3,4	SV2	3639	1749	Y	0.2	4/08/2023	11:18am	11:33am	-28Hg"	-6Hg"	300mL	X	X							0171504427
5,6	SV3	1871	1747	Y	0.1	4/08/2023	11:58am	12:14am	-30Hg"	-6Hg"	300mL	X	X							0171504429
7,8	SV4	2288	1748	Y	0.2	4/08/2023	12:47pm	1:04pm	-30Hg"	-6Hg"	300mL	X	X							0171504431
9,10	SV5	3290	1779	Y	0.1	4/08/2023	1:41pm	1:57pm	-29Hg"	-6Hg"	300mL	X	X							0171504426
11,12	SVDUP1	2274	1976	Y	NA	4/08/2023	12:47pm	1:03pm	-30Hg"	-6Hg"	100mL	X	X							0171504428
13	Shroud	-	-	NA	NA	4/08/2023	11:05am	11:06pm	-	-	50mL			X						0171504433

* General Gases - Please tick one:

- ☐ 1) Methane, Oxygen, Carbon dioxide, Carbon monoxide, Nitrogen
- ☐ 2) Methane, Oxygen, Carbon dioxide, Carbon monoxide, Helium, Hydrogen
- ☐ 3) Specify analytes (NB: If both Nitrogen and Helium/Hydrogen are require, please contact the laboratory

Relinquished by (Company):	JKE	Received by (Company):	ELS SYD	*Lab Use Only:*	
Print Name:	Harley Wang	Print Name:	Joe Wang	Job Number:	325836
Date & Time:	4/08/23 at 4:00pm	Date & Time:	07/08/2023 14:30	Security seal: Intact / Broken / None	
Signature:	HW	Signature:		TAT Req - SAME day / 1 / 2 / 3 / 4 / STD	

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CERTIFICATE OF ANALYSIS 39094

Client Details

Client	JK Environments
Attention	Vittal Boggaram
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E34303B**
Number of Samples	1 Water
Date samples received	15/08/2023
Date completed instructions received	15/08/2023

Analysis Details

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

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

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

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

Report Details

Date results requested by	21/08/2023
Date of Issue	21/08/2023

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Results Approved By
Pamela Adams, Laboratory Manager, Melbourne
Tara White, Metals Team Leader
Tianna Milburn, Senior Chemist

Authorised By
Pamela Adams, Laboratory Manager

VOCs in water - Routine Level		
Our Reference		39094-1
Your Reference	UNITS	SDUP2
Date Sampled		10/08/2023
Type of sample		Water
Date extracted	-	17/08/2023
Date analysed	-	17/08/2023
Dichlorodifluoromethane	µg/L	<10
Chloromethane	µg/L	<10
Vinyl Chloride	µg/L	<10
Bromomethane	µg/L	<10
Chloroethane	µg/L	<10
Trichlorofluoromethane	µg/L	<10
1,1-Dichloroethene	µg/L	<1
Trans-1,2-dichloroethene	µg/L	<1
1,1-dichloroethane	µg/L	<1
Cis-1,2-dichloroethene	µg/L	<1
Bromochloromethane	µg/L	<1
Chloroform	µg/L	2
2,2-dichloropropane	µg/L	<1
1,2-dichloroethane	µg/L	<1
1,1,1-trichloroethane	µg/L	<1
1,1-dichloropropene	µg/L	<1
Cyclohexane	µg/L	<1
Carbon tetrachloride	µg/L	<1
Benzene	µg/L	3
Dibromomethane	µg/L	<1
1,2-dichloropropane	µg/L	<1
Trichloroethene	µg/L	<1
Bromodichloromethane	µg/L	<1
trans-1,3-dichloropropene	µg/L	<1
cis-1,3-dichloropropene	µg/L	<1
1,1,2-trichloroethane	µg/L	<1
Toluene	µg/L	<1
1,3-dichloropropane	µg/L	<1
Dibromochloromethane	µg/L	<1
1,2-dibromoethane	µg/L	<1
Tetrachloroethene	µg/L	<1
1,1,1,2-tetrachloroethane	µg/L	<1
Chlorobenzene	µg/L	<1
Ethylbenzene	µg/L	<1

VOCs in water - Routine Level		
Our Reference		39094-1
Your Reference	UNITS	SDUP2
Date Sampled		10/08/2023
Type of sample		Water
Bromoform	µg/L	<1
m+p-xylene	µg/L	<2
Styrene	µg/L	<1
1,1,2,2-tetrachloroethane	µg/L	<1
o-xylene	µg/L	<1
1,2,3-trichloropropane	µg/L	<1
Isopropylbenzene	µg/L	<1
Bromobenzene	µg/L	<1
n-propyl benzene	µg/L	<1
2-chlorotoluene	µg/L	<1
4-chlorotoluene	µg/L	<1
1,3,5-trimethyl benzene	µg/L	<1
Tert-butyl benzene	µg/L	<1
1,2,4-trimethyl benzene	µg/L	<1
1,3-dichlorobenzene	µg/L	<1
Sec-butyl benzene	µg/L	<1
1,4-dichlorobenzene	µg/L	<1
4-isopropyl toluene	µg/L	<1
1,2-dichlorobenzene	µg/L	<1
n-butyl benzene	µg/L	<1
1,2-dibromo-3-chloropropane	µg/L	<1
1,2,4-trichlorobenzene	µg/L	<1
Hexachlorobutadiene	µg/L	<1
1,2,3-trichlorobenzene	µg/L	<1
Surrogate Dibromofluoromethane	%	101
Surrogate toluene-d8	%	100
Surrogate 4-BFB	%	98

vTRH(C6-C10)/BTEXN in Water		
Our Reference		39094-1
Your Reference	UNITS	SDUP2
Date Sampled		10/08/2023
Type of sample		Water
Date extracted	-	17/08/2023
Date analysed	-	17/08/2023
TRH C_6 - C_9	µg/L	<10
TRH C_6 - C_{10}	µg/L	<10
TRH C_6 -C_{10} less BTEX (F1)	µg/L	<10
Benzene	µg/L	3
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Naphthalene	µg/L	<1
Total +ve Xylenes	µg/L	<1
Total BTEX in water	µg/L	3
Surrogate Dibromofluoromethane	%	95
Surrogate toluene-d8	%	97
Surrogate 4-BFB	%	97

TRH Water(C10-C40) NEPM		
Our Reference		39094-1
Your Reference	UNITS	SDUP2
Date Sampled		10/08/2023
Type of sample		Water
Date extracted	-	16/08/2023
Date analysed	-	16/08/2023
TRH C_{10} - C_{14}	µg/L	<50
TRH C_{15} - C_{28}	µg/L	<100
TRH C_{29} - C_{36}	µg/L	<100
Total +ve TRH (C10-C36)	µg/L	<50
TRH >C_{10} - C_{16}	µg/L	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50
TRH >C_{16} - C_{34}	µg/L	<100
TRH >C_{34} - C_{40}	µg/L	<100
Total +ve TRH (>C10-C40)	µg/L	<50
Surrogate o-Terphenyl	%	86

PAHs in Water		
Our Reference		39094-1
Your Reference	UNITS	SDUP2
Date Sampled		10/08/2023
Type of sample		Water
Date extracted	-	16/08/2023
Date analysed	-	16/08/2023
Naphthalene	µg/L	<0.1
Acenaphthylene	µg/L	<0.1
Acenaphthene	µg/L	<0.1
Fluorene	µg/L	<0.1
Phenanthrene	µg/L	<0.1
Anthracene	µg/L	<0.1
Fluoranthene	µg/L	<0.1
Pyrene	µg/L	<0.1
Benzo(a)anthracene	µg/L	<0.1
Chrysene	µg/L	<0.1
Benzo(b,j&k)fluoranthene	µg/L	<0.2
Benzo(a)pyrene	µg/L	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1
Total +ve PAH's	µg/L	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5
Surrogate p-Terphenyl-d_{14}	%	114

HM in water - dissolved		
Our Reference		39094-1
Your Reference	UNITS	SDUP2
Date Sampled		10/08/2023
Type of sample		Water
Date prepared	-	17/08/2023
Date analysed	-	17/08/2023
Arsenic-Dissolved	µg/L	1
Cadmium-Dissolved	µg/L	<0.1
Chromium-Dissolved	µg/L	2
Copper-Dissolved	µg/L	7
Lead-Dissolved	µg/L	1
Nickel-Dissolved	µg/L	3
Zinc-Dissolved	µg/L	25
Mercury-Dissolved	µg/L	<0.05

PFAS in water TRACE Extended		
Our Reference		39094-1
Your Reference	UNITS	SDUP2
Date Sampled		10/08/2023
Type of sample		Water
Date prepared	-	18/08/2023
Date analysed	-	21/08/2023
Perfluorobutanesulfonic acid	µg/L	0.0055
Perfluoropentanesulfonic acid	µg/L	<0.001
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.0065
Perfluoroheptanesulfonic acid	µg/L	<0.001
Perfluorooctanesulfonic acid PFOS	µg/L	0.015
Perfluorodecanesulfonic acid	µg/L	<0.002
Perfluorobutanoic acid	µg/L	0.020
Perfluoropentanoic acid	µg/L	0.010
Perfluorohexanoic acid	µg/L	0.015
Perfluoroheptanoic acid	µg/L	0.0057
Perfluorooctanoic acid PFOA	µg/L	0.014
Perfluorononanoic acid	µg/L	0.002
Perfluorodecanoic acid	µg/L	<0.002
Perfluoroundecanoic acid	µg/L	<0.002
Perfluorododecanoic acid	µg/L	<0.005
Perfluorotridecanoic acid	µg/L	<0.01
Perfluorotetradecanoic acid	µg/L	<0.05
4:2 FTS	µg/L	<0.001
6:2 FTS	µg/L	<0.0004
8:2 FTS	µg/L	<0.0004
10:2 FTS	µg/L	<0.002
Perfluorooctane sulfonamide	µg/L	<0.01
N-Methyl perfluorooctane sulfonamide	µg/L	<0.05
N-Ethyl perfluorooctanesulfon -amide	µg/L	<0.1
N-Me perfluorooctanesulfonamid -oethanol	µg/L	<0.05
N-Et perfluorooctanesulfonamid -oethanol	µg/L	<0.5
MePerfluorooctanesulf- amid oacetic acid	µg/L	<0.002
EtPerfluorooctanesulf- amid oacetic acid	µg/L	<0.002
Surrogate $^{13}C_8$ PFOS	%	99
Surrogate $^{13}C_2$ PFOA	%	104
Extracted ISTD $^{13}C_3$ *PFBS*	%	91
Extracted ISTD $^{18}O_2$ *PFHxS*	%	127
Extracted ISTD $^{13}C_4$ *PFOS*	%	81
Extracted ISTD $^{13}C_4$ *PFBA*	%	35

PFAS in water TRACE Extended		
Our Reference		39094-1
Your Reference	UNITS	SDUP2
Date Sampled		10/08/2023
Type of sample		Water
Extracted ISTD $^{13}C_3$ *PFPeA*	%	66
Extracted ISTD $^{13}C_2$ *PFHxA*	%	117
Extracted ISTD $^{13}C_4$ *PFHpA*	%	144
Extracted ISTD $^{13}C_4$ *PFOA*	%	100
Extracted ISTD $^{13}C_5$ *PFNA*	%	84
Extracted ISTD $^{13}C_2$ *PFDA*	%	104
Extracted ISTD $^{13}C_2$ *PFUnDA*	%	108
Extracted ISTD $^{13}C_2$ *PFDoDA*	%	82
Extracted ISTD $^{13}C_2$ *PFTeDA*	%	87
Extracted ISTD $^{13}C_2$ *4:2FTS*	%	191
Extracted ISTD $^{13}C_2$ *6:2FTS*	%	180
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	165
Extracted ISTD $^{13}C_8$ *FOSA*	%	83
Extracted ISTD d_3 *N MeFOSA*	%	99
Extracted ISTD d_5 *N EtFOSAA*	%	100
Extracted ISTD d_7 *N MeFOSE*	%	109
Extracted ISTD d_9 *N EtFOSE*	%	120
Extracted ISTD d_3 *N MeFOSAA*	%	106
Extracted ISTD d_5 *N EtFOSAA*	%	154
Total Positive PFHxS & PFOS	µg/L	0.022
Total Positive PFOS & PFOA	µg/L	0.029
Total Positive PFAS	µg/L	0.094

Method ID	Methodology Summary
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Metals-022 ICP-MS	Determination of various metals by ICP-MS. 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.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater 2013.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

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

QUALITY CONTROL: VOCs in water - Routine Level						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			17/08/2023	[NT]	[NT]	[NT]	[NT]	17/08/2023	[NT]
Date analysed	-			17/08/2023	[NT]	[NT]	[NT]	[NT]	17/08/2023	[NT]
Dichlorodifluoromethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloromethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromomethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroform	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
2,2-dichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
1,1,1-trichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
1,1-dichloropropene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Cyclohexane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibromomethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Bromodichloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
1,2-dibromoethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromoform	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	91	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Styrene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

QUALITY CONTROL: VOCs in water - Routine Level					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,3-trichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Isopropylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-propyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3,5-trimethyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Tert-butyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trimethyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Sec-butyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-isopropyl toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-butyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	97	[NT]	[NT]	[NT]	[NT]	101	[NT]
Surrogate toluene-d8	%		Org-023	100	[NT]	[NT]	[NT]	[NT]	99	[NT]
Surrogate 4-BFB	%		Org-023	95	[NT]	[NT]	[NT]	[NT]	101	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			17/08/2023	[NT]	[NT]	[NT]	[NT]	17/08/2023	[NT]
Date analysed	-			17/08/2023	[NT]	[NT]	[NT]	[NT]	17/08/2023	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	104	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	104	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	104	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Naphthalene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Surrogate Dibromofluoromethane	%		Org-023	93	[NT]	[NT]	[NT]	[NT]	94	[NT]
Surrogate toluene-d8	%		Org-023	97	[NT]	[NT]	[NT]	[NT]	99	[NT]
Surrogate 4-BFB	%		Org-023	94	[NT]	[NT]	[NT]	[NT]	97	[NT]

QUALITY CONTROL: TRH Water(C10-C40) NEPM					Duplicate					Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			16/08/2023	[NT]	[NT]	[NT]	[NT]	16/08/2023	[NT]
Date analysed	-			16/08/2023	[NT]	[NT]	[NT]	[NT]	16/08/2023	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	83	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	104	[NT]
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	107	[NT]
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	83	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	104	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	107	[NT]
Surrogate o-Terphenyl	%		Org-020	81	[NT]	[NT]	[NT]	[NT]	74	[NT]

QUALITY CONTROL: PAHs in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			16/08/2023	[NT]	[NT]	[NT]	[NT]	16/08/2023	[NT]
Date analysed	-			16/08/2023	[NT]	[NT]	[NT]	[NT]	16/08/2023	[NT]
Naphthalene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Acenaphthylene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	116	[NT]
Fluorene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	117	[NT]
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	122	[NT]
Anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	129	[NT]
Pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	133	[NT]
Benzo(a)anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Benzo(b,j&k)fluoranthene	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	135	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d_{14}	%		Org-022/025	115	[NT]	[NT]	[NT]	[NT]	108	[NT]

QUALITY CONTROL: HM in water - dissolved					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	39094-1
Date prepared	-			17/08/2023	[NT]	[NT]	[NT]	[NT]	17/08/2023	17/08/2023
Date analysed	-			17/08/2023	[NT]	[NT]	[NT]	[NT]	17/08/2023	17/08/2023
Arsenic-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	[NT]	[NT]	100	104
Cadmium-Dissolved	µg/L	0.1	Metals-022 ICP-MS	<0.1	[NT]	[NT]	[NT]	[NT]	101	103
Chromium-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	[NT]	[NT]	100	101
Copper-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	[NT]	[NT]	99	100
Lead-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	[NT]	[NT]	99	100
Nickel-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	[NT]	[NT]	102	100
Zinc-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	[NT]	[NT]	98	98
Mercury-Dissolved	µg/L	0.05	Metals-021 CV-AAS	<0.05	[NT]	[NT]	[NT]	[NT]	106	108

QUALITY CONTROL: PFAS in water TRACE Extended						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	39094-1
Perfluorobutanesulfonic acid	µg/L	0.0004	Org-029	<0.0004	1	0.0055	0.0055	0	109	103
Perfluoropentanesulfonic acid	µg/L	0.001	Org-029	<0.001	1	<0.001	<0.001	0	103	106
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.0002	Org-029	<0.0002	1	0.0065	0.0065	0	97	115
Perfluoroheptanesulfonic acid	µg/L	0.001	Org-029	<0.001	1	<0.001	<0.001	0	104	113
Perfluorooctanesulfonic acid PFOS	µg/L	0.0002	Org-029	<0.0002	1	0.015	0.015	0	111	113
Perfluorodecanesulfonic acid	µg/L	0.002	Org-029	<0.002	1	<0.002	<0.002	0	87	87
Perfluorobutanoic acid	µg/L	0.002	Org-029	<0.002	1	0.020	0.020	0	111	114
Perfluoropentanoic acid	µg/L	0.002	Org-029	<0.002	1	0.010	0.010	0	125	130
Perfluorohexanoic acid	µg/L	0.0004	Org-029	<0.0004	1	0.015	0.016	6	99	103
Perfluoroheptanoic acid	µg/L	0.0004	Org-029	<0.0004	1	0.0057	0.0059	3	98	101
Perfluorooctanoic acid PFOA	µg/L	0.0002	Org-029	<0.0002	1	0.014	0.013	7	100	107
Perfluorononanoic acid	µg/L	0.001	Org-029	<0.001	1	0.002	0.002	0	123	131
Perfluorodecanoic acid	µg/L	0.002	Org-029	<0.002	1	<0.002	<0.002	0	96	86
Perfluoroundecanoic acid	µg/L	0.002	Org-029	<0.002	1	<0.002	<0.002	0	102	99
Perfluorododecanoic acid	µg/L	0.005	Org-029	<0.005	1	<0.005	<0.005	0	122	120
Perfluorotridecanoic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	96	138
Perfluorotetradecanoic acid	µg/L	0.05	Org-029	<0.05	1	<0.05	<0.05	0	79	107
4:2 FTS	µg/L	0.001	Org-029	<0.001	1	<0.001	<0.001	0	95	100
6:2 FTS	µg/L	0.0004	Org-029	<0.0004	1	<0.0004	<0.0004	0	105	119
8:2 FTS	µg/L	0.0004	Org-029	<0.0004	1	<0.0004	<0.0004	0	106	117
10:2 FTS	µg/L	0.002	Org-029	<0.002	1	<0.002	<0.002	0	131	134
Perfluorooctane sulfonamide	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	101	99
N-Methyl perfluorooctane sulfonamide	µg/L	0.05	Org-029	<0.05	1	<0.05	<0.05	0	129	99
N-Ethyl perfluorooctanesulfon -amide	µg/L	0.1	Org-029	<0.1	1	<0.1	<0.1	0	126	103
N-Me perfluorooctanesulfonamid -oethanol	µg/L	0.05	Org-029	<0.05	1	<0.05	<0.05	0	129	120
N-Et perfluorooctanesulfonamid -oethanol	µg/L	0.5	Org-029	<0.5	1	<0.5	<0.5	0	133	128
MePerfluorooctanesulf- amid oacetic acid	µg/L	0.002	Org-029	<0.002	1	<0.002	<0.002	0	118	105
EtPerfluorooctanesulf- amid oacetic acid	µg/L	0.002	Org-029	<0.002	1	<0.002	<0.002	0	114	108
Surrogate $^{13}C_8$ PFOS	%		Org-029	98	1	99	102	3	97	99
Surrogate $^{13}C_2$ PFOA	%		Org-029	99	1	104	101	3	99	110
Extracted ISTD $^{13}C_3$ PFBS	%		Org-029	96	1	91	89	2	90	85

QUALITY CONTROL: PFAS in water TRACE Extended						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	39094-1
Extracted ISTD $^{18}O_2$ PFHxS	%		Org-029	120	1	127	122	4	113	111
Extracted ISTD $^{13}C_4$ PFOS	%		Org-029	87	1	81	77	5	83	75
Extracted ISTD $^{13}C_4$ PFBA	%		Org-029	102	1	35	36	3	98	34
Extracted ISTD $^{13}C_3$ PFPeA	%		Org-029	93	1	66	68	3	93	62
Extracted ISTD $^{13}C_2$ PFHxA	%		Org-029	117	1	117	108	8	136	102
Extracted ISTD $^{13}C_4$ PFHpA	%		Org-029	141	1	144	140	3	124	131
Extracted ISTD $^{13}C_4$ PFOA	%		Org-029	98	1	100	99	1	96	92
Extracted ISTD $^{13}C_5$ PFNA	%		Org-029	98	1	84	88	5	90	81
Extracted ISTD $^{13}C_2$ PFDA	%		Org-029	113	1	104	108	4	100	108
Extracted ISTD $^{13}C_2$ PFUnDA	%		Org-029	118	1	108	98	10	107	99
Extracted ISTD $^{13}C_2$ PFDoDA	%		Org-029	75	1	82	70	16	74	74
Extracted ISTD $^{13}C_2$ PFTeDA	%		Org-029	57	1	87	82	6	54	80
Extracted ISTD $^{13}C_2$ 4:2FTS	%		Org-029	143	1	191	184	4	138	161
Extracted ISTD $^{13}C_2$ 6:2FTS	%		Org-029	140	1	180	173	4	133	166
Extracted ISTD $^{13}C_2$ 8:2FTS	%		Org-029	145	1	165	144	14	133	139
Extracted ISTD $^{13}C_8$ FOSA	%		Org-029	62	1	83	86	4	72	62
Extracted ISTD d_3 N MeFOSA	%		Org-029	95	1	99	102	3	95	96
Extracted ISTD d_5 N EtFOSAA	%		Org-029	90	1	100	97	3	92	92
Extracted ISTD d_7 N MeFOSE	%		Org-029	107	1	109	112	3	111	120
Extracted ISTD d_9 N EtFOSE	%		Org-029	109	1	120	130	8	115	120

QUALITY CONTROL: PFAS in water TRACE Extended					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	39094-1
Extracted ISTD d_3 *N MeFOSAA*	%		Org-029	96	1	106	90	16	94	96
Extracted ISTD d_5 *N EtFOSAA*	%		Org-029	125	1	154	122	23	121	120

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
PFAS analysed by Envirolab Sydney, report 330647.

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

SAMPLE RECEIPT ADVICE

Client Details	
Client	JK Environments
Attention	Vittal Boggaram

Sample Login Details	
Your reference	E34303B
Envirolab Reference	39094
Date Sample Received	15/08/2023
Date Instructions Received	15/08/2023
Date Results Expected to be Reported	21/08/2023

Sample Condition	
Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	1 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	9.6
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments
Nil

Please direct any queries to:

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

Analysis Underway, details on the following page:

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

Sample ID	VOCs in water - Routine Level	vTRH(C6-C10)/BTEXN in Water	TRH Water(C10-C40) NEPM	PAHs in Water	HM in water - dissolved	PFAS in water TRACE Extended
SDUP2	✓	✓	✓	✓	✓	✓

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

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

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD 12 ASHLEY STREET CHATSWOOD NSW 2067 P: (02) 99106200 F: (02) 99106201 Attention: Aileen	JKE Job Number: E34303B Date Results Required: STANDARD Page: 1 of 1	JKEnvironments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: Vittal Boggaram vboggaram@jkenvironments.com.au

Location: Potts Point

~~Sampler: AD/CB~~

Sample Preserved in Esky on Ice

~~Tests Required~~

Date Sampled	Lab Ref:	Sample Number	Sample Containers	PID	Sample Description	Combo 3L	VOCs	pH/EC	PFAS - trace extended	PFAS - trace short	BTEX						
10/08/2023	1	MW1	G, H, PVC, Vx4, Px2		Water	X	X	X	X								
10/08/2023	2	MW2	G, H, PVC, Vx4, Px2		Water	X	X	X	X								
10/08/2023	3	MW3	G, H, PVC, Vx4, Px2		Water	X	X	X	X								
10/08/2023	4	SDUP1	G, H, PVC, Vx4, Px2	-	Duplicate	X	X		X								
1 10/08/2023		**SDUP2	G, H, PVC, Vx4, Px2	-	Duplicate	X	X		X								
10/08/2023	5	TB-W1	G, H, Vx2, P	-	Trip Blank	X				X							
~~10/08/2023~~	NR	~~TS-W1~~	~~V~~	~~-~~	~~Trip Spike~~						~~X~~						
10/08/2023	6	FR-W1	G, H, Vx2, P	-	Field Rinsate	X				X							

ENVIROLAB
Envirolab Services
25 Research Drive
Croydon South VIC 3136
Ph: (03) 9763 2500
Job No: 39094
Date Received: 15/8/23
Time Received: 12:25pm
Received By: AG
Temp: Cool/Ambient 9.6°C
Cooling: Ice/Icepack
Security: Intact/Broken/None

ENVIROLAB
Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200
Job No: 330183
Date Received: 10/8/23
Time Received: 16:00
Received By: LO
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Remarks (comments/detection limits required):	Sample Containers:
All analysis PQLs to ANZECC (2000) Detection Limits Please **Please sent to VIC as interlab duplicate	G - 500mL Amber Glass Bottle V - BTEX Vial H - HNO3 Wash PVC PVC - HDPE Plastic Bottles P - PFAS bottle

Relinquished By:	Date: 10-08-23	Time: 4pm	Received By:	Date:
VB				

Relinquished by: Christine Ho
ELS SYD
14/8/23 1230

Envirolab Services Pty Ltd
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12 Ashley St Chatswood NSW 2067
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www.envirolab.com.au

CERTIFICATE OF ANALYSIS 330183

Client Details

Client	JK Environments
Attention	Vittal Boggaram
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E34303B, Potts Point**
Number of Samples	7 Water
Date samples received	10/08/2023
Date completed instructions received	10/08/2023

Analysis Details

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

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

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

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

Report Details

Date results requested by	17/08/2023
Date of Issue	17/08/2023

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

Results Approved By
Diego Bigolin, Inorganics Supervisor
Dragana Tomas, Senior Chemist
Loren Bardwell, Development Chemist
Phalak Inthakesone, Organics Development Manager, Sydney

Authorised By
Nancy Zhang, Laboratory Manager

VOCs in water					
Our Reference		330183-1	330183-2	330183-3	330183-4
Your Reference	UNITS	MW1	MW2	MW3	SDUP1
Date Sampled		10/08/2023	10/08/2023	10/08/2023	10/08/2023
Type of sample		Water	Water	Water	Water
Date extracted	-	11/08/2023	11/08/2023	11/08/2023	11/08/2023
Date analysed	-	14/08/2023	14/08/2023	14/08/2023	14/08/2023
Dichlorodifluoromethane	µg/L	<10	<10	<10	<10
Chloromethane	µg/L	<10	<10	<10	<10
Vinyl Chloride	µg/L	<10	<10	<10	<10
Bromomethane	µg/L	<10	<10	<10	<10
Chloroethane	µg/L	<10	<10	<10	<10
Trichlorofluoromethane	µg/L	<10	<10	<10	<10
1,1-Dichloroethene	µg/L	<1	<1	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1	<1	<1
1,1-dichloroethane	µg/L	<1	<1	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1	<1
Chloroform	µg/L	<1	2	<1	<1
2,2-dichloropropane	µg/L	<1	<1	<1	<1
1,2-dichloroethane	µg/L	<1	<1	<1	<1
1,1,1-trichloroethane	µg/L	<1	<1	<1	<1
1,1-dichloropropene	µg/L	<1	<1	<1	<1
Cyclohexane	µg/L	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1
Benzene	µg/L	<1	3	<1	<1
Dibromomethane	µg/L	<1	<1	<1	<1
1,2-dichloropropane	µg/L	<1	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1	<1
Bromodichloromethane	µg/L	<1	<1	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1	<1	<1
Toluene	µg/L	<1	<1	<1	<1
1,3-dichloropropane	µg/L	<1	<1	<1	<1
Dibromochloromethane	µg/L	<1	<1	<1	<1
1,2-dibromoethane	µg/L	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1	<1	<1
Chlorobenzene	µg/L	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1

VOCs in water					
Our Reference	UNITS	330183-1	330183-2	330183-3	330183-4
Your Reference		MW1	MW2	MW3	SDUP1
Date Sampled		10/08/2023	10/08/2023	10/08/2023	10/08/2023
Type of sample		Water	Water	Water	Water
Bromoform	µg/L	<1	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2	<2
Styrene	µg/L	<1	<1	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1	<1	<1
o-xylene	µg/L	<1	<1	<1	<1
1,2,3-trichloropropane	µg/L	<1	<1	<1	<1
Isopropylbenzene	µg/L	<1	<1	<1	<1
Bromobenzene	µg/L	<1	<1	<1	<1
n-propyl benzene	µg/L	<1	<1	<1	<1
2-chlorotoluene	µg/L	<1	<1	<1	<1
4-chlorotoluene	µg/L	<1	<1	<1	<1
1,3,5-trimethyl benzene	µg/L	<1	<1	<1	<1
Tert-butyl benzene	µg/L	<1	<1	<1	<1
1,2,4-trimethyl benzene	µg/L	<1	<1	<1	<1
1,3-dichlorobenzene	µg/L	<1	<1	<1	<1
Sec-butyl benzene	µg/L	<1	<1	<1	<1
1,4-dichlorobenzene	µg/L	<1	<1	<1	<1
4-isopropyl toluene	µg/L	<1	<1	<1	<1
1,2-dichlorobenzene	µg/L	<1	<1	<1	<1
n-butyl benzene	µg/L	<1	<1	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1	<1	<1
Hexachlorobutadiene	µg/L	<1	<1	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	100	102	103	104
Surrogate toluene-d8	%	95	95	95	97
Surrogate 4-BFB	%	107	107	107	107

vTRH(C6-C10)/BTEXN in Water						
Our Reference		330183-1	330183-2	330183-3	330183-4	330183-5
Your Reference	UNITS	MW1	MW2	MW3	SDUP1	TB-W1
Date Sampled		10/08/2023	10/08/2023	10/08/2023	10/08/2023	10/08/2023
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	11/08/2023	11/08/2023	11/08/2023	11/08/2023	11/08/2023
Date analysed	-	14/08/2023	14/08/2023	14/08/2023	14/08/2023	14/08/2023
TRH C_6 - C_9	µg/L	<10	<10	<10	<10	<10
TRH C_6 - C_{10}	µg/L	<10	<10	<10	<10	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10	<10	<10	<10	<10
Benzene	µg/L	<1	3	<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	%	100	102	103	104	103
Surrogate toluene-d8	%	95	95	95	97	95
Surrogate 4-BFB	%	107	107	107	107	106

vTRH(C6-C10)/BTEXN in Water			
Our Reference		330183-6	330183-7
Your Reference	UNITS	FR-W1	TS-W1
Date Sampled		10/08/2023	10/08/2023
Type of sample		Water	Water
Date extracted	-	11/08/2023	11/08/2023
Date analysed	-	14/08/2023	14/08/2023
TRH C_6 - C_9	µg/L	89	[NA]
TRH C_6 - C_{10}	µg/L	89	[NA]
TRH C_6 - C_{10} less BTEX (F1)	µg/L	89	[NA]
Benzene	µg/L	<1	113%
Toluene	µg/L	<1	104%
Ethylbenzene	µg/L	<1	113%
m+p-xylene	µg/L	<2	103%
o-xylene	µg/L	<1	103%
Naphthalene	µg/L	<1	[NA]
Surrogate Dibromofluoromethane	%	99	104
Surrogate toluene-d8	%	99	100
Surrogate 4-BFB	%	107	98

svTRH (C10-C40) in Water						
Our Reference		330183-1	330183-2	330183-3	330183-4	330183-5
Your Reference	UNITS	MW1	MW2	MW3	SDUP1	TB-W1
Date Sampled		10/08/2023	10/08/2023	10/08/2023	10/08/2023	10/08/2023
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	11/08/2023	11/08/2023	11/08/2023	11/08/2023	11/08/2023
Date analysed	-	12/08/2023	12/08/2023	12/08/2023	12/08/2023	12/08/2023
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	%	105	113	94	91	92

svTRH (C10-C40) in Water		
Our Reference		330183-6
Your Reference	UNITS	FR-W1
Date Sampled		10/08/2023
Type of sample		Water
Date extracted	-	11/08/2023
Date analysed	-	12/08/2023
TRH C_{10} - C_{14}	µg/L	<50
TRH C_{15} - C_{28}	µg/L	<100
TRH C_{29} - C_{36}	µg/L	<100
Total +ve TRH (C10-C36)	µg/L	<50
TRH >C_{10} - C_{16}	µg/L	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50
TRH >C_{16} - C_{34}	µg/L	<100
TRH >C_{34} - C_{40}	µg/L	<100
Total +ve TRH (>C10-C40)	µg/L	<50
Surrogate o-Terphenyl	%	93

PAHs in Water						
Our Reference		330183-1	330183-2	330183-3	330183-4	330183-5
Your Reference	UNITS	MW1	MW2	MW3	SDUP1	TB-W1
Date Sampled		10/08/2023	10/08/2023	10/08/2023	10/08/2023	10/08/2023
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	11/08/2023	11/08/2023	11/08/2023	11/08/2023	11/08/2023
Date analysed	-	11/08/2023	11/08/2023	11/08/2023	11/08/2023	11/08/2023
Naphthalene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Acenaphthylene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d14	%	114	113	104	94	99

PAHs in Water		
Our Reference		330183-6
Your Reference	UNITS	FR-W1
Date Sampled		10/08/2023
Type of sample		Water
Date extracted	-	11/08/2023
Date analysed	-	11/08/2023
Naphthalene	μg/L	<0.2
Acenaphthylene	μg/L	<0.1
Acenaphthene	μg/L	<0.1
Fluorene	μg/L	<0.1
Phenanthrene	μg/L	<0.1
Anthracene	μg/L	<0.1
Fluoranthene	μg/L	<0.1
Pyrene	μg/L	<0.1
Benzo(a)anthracene	μg/L	<0.1
Chrysene	μg/L	<0.1
Benzo(b,j+k)fluoranthene	μg/L	<0.2
Benzo(a)pyrene	μg/L	<0.1
Indeno(1,2,3-c,d)pyrene	μg/L	<0.1
Dibenzo(a,h)anthracene	μg/L	<0.1
Benzo(g,h,i)perylene	μg/L	<0.1
Benzo(a)pyrene TEQ	μg/L	<0.5
Total +ve PAH's	μg/L	<0.1
Surrogate p-Terphenyl-d14	%	99

HM in water - dissolved						
Our Reference		330183-1	330183-2	330183-3	330183-4	330183-5
Your Reference	UNITS	MW1	MW2	MW3	SDUP1	TB-W1
Date Sampled		10/08/2023	10/08/2023	10/08/2023	10/08/2023	10/08/2023
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	11/08/2023	11/08/2023	11/08/2023	11/08/2023	11/08/2023
Date analysed	-	11/08/2023	11/08/2023	11/08/2023	11/08/2023	11/08/2023
Arsenic-Dissolved	µg/L	<1	1	1	1	<1
Cadmium-Dissolved	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium-Dissolved	µg/L	2	2	<1	2	<1
Copper-Dissolved	µg/L	6	7	6	6	<1
Lead-Dissolved	µg/L	<1	1	<1	<1	<1
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel-Dissolved	µg/L	1	2	2	1	<1
Zinc-Dissolved	µg/L	17	23	6	16	<1

HM in water - dissolved		
Our Reference		330183-6
Your Reference	UNITS	FR-W1
Date Sampled		10/08/2023
Type of sample		Water
Date prepared	-	11/08/2023
Date analysed	-	11/08/2023
Arsenic-Dissolved	µg/L	<1
Cadmium-Dissolved	µg/L	<0.1
Chromium-Dissolved	µg/L	<1
Copper-Dissolved	µg/L	760
Lead-Dissolved	µg/L	1
Mercury-Dissolved	µg/L	<0.05
Nickel-Dissolved	µg/L	<1
Zinc-Dissolved	µg/L	5

Miscellaneous Inorganics				
Our Reference		330183-1	330183-2	330183-3
Your Reference	UNITS	MW1	MW2	MW3
Date Sampled		10/08/2023	10/08/2023	10/08/2023
Type of sample		Water	Water	Water
Date prepared	-	10/08/2023	10/08/2023	10/08/2023
Date analysed	-	10/08/2023	10/08/2023	10/08/2023
pH	pH Units	6.0	5.7	7.6
Electrical Conductivity	µS/cm	170	170	420

PFAS in Waters Trace Extended					
Our Reference		330183-1	330183-2	330183-3	330183-4
Your Reference	UNITS	MW1	MW2	MW3	SDUP1
Date Sampled		10/08/2023	10/08/2023	10/08/2023	10/08/2023
Type of sample		Water	Water	Water	Water
Date prepared	-	11/08/2023	11/08/2023	11/08/2023	11/08/2023
Date analysed	-	11/08/2023	11/08/2023	11/08/2023	11/08/2023
Perfluorobutanesulfonic acid	µg/L	0.0082	0.0089	0.010	0.0082
Perfluoropentanesulfonic acid	µg/L	<0.001	<0.001	<0.001	<0.001
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.0085	0.0068	0.013	0.0085
Perfluoroheptanesulfonic acid	µg/L	0.001	<0.001	<0.001	0.001
Perfluorooctanesulfonic acid PFOS	µg/L	0.042	0.015	0.047	0.041
Perfluorodecanesulfonic acid	µg/L	<0.002	<0.002	<0.002	<0.002
Perfluorobutanoic acid	µg/L	0.025	0.02	0.021	0.025
Perfluoropentanoic acid	µg/L	0.040	0.01	0.044	0.039
Perfluorohexanoic acid	µg/L	0.043	0.018	0.057	0.041
Perfluoroheptanoic acid	µg/L	0.014	0.0063	0.019	0.013
Perfluorooctanoic acid PFOA	µg/L	0.027	0.012	0.027	0.026
Perfluorononanoic acid	µg/L	0.003	0.002	0.007	0.003
Perfluorodecanoic acid	µg/L	<0.002	<0.002	0.007	<0.002
Perfluoroundecanoic acid	µg/L	<0.002	<0.002	<0.002	<0.002
Perfluorododecanoic acid	µg/L	<0.005	<0.005	<0.005	<0.005
Perfluorotridecanoic acid	µg/L	<0.01	<0.01	<0.01	<0.01
Perfluorotetradecanoic acid	µg/L	<0.05	<0.05	<0.05	<0.05
4:2 FTS	µg/L	<0.001	<0.001	<0.001	<0.001
6:2 FTS	µg/L	<0.0004	<0.0004	<0.0004	<0.0004
8:2 FTS	µg/L	<0.0004	<0.0004	<0.0004	<0.0004
10:2 FTS	µg/L	<0.002	<0.002	<0.002	<0.002
Perfluorooctane sulfonamide	µg/L	<0.01	<0.01	<0.01	<0.01
N-Methyl perfluorooctane sulfonamide	µg/L	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctanesulfon amide	µg/L	<0.1	<0.1	<0.1	<0.1
N-Me perfluorooctanesulfonamid oethanol	µg/L	<0.05	<0.05	<0.05	<0.05
N-Et perfluorooctanesulfonamid oethanol	µg/L	<0.5	<0.5	<0.5	<0.5
MePerfluorooctanesulf- amid oacetic acid	µg/L	<0.002	<0.002	<0.002	<0.002
EtPerfluorooctanesulf- amid oacetic acid	µg/L	<0.002	<0.002	<0.002	<0.002
Surrogate $^{13}C_8$ PFOS	%	101	104	98	102
Surrogate $^{13}C_2$ PFOA	%	102	105	106	111
Extracted ISTD $^{13}C_3$ PFBS	%	76	80	76	78
Extracted ISTD $^{18}O_2$ PFHxS	%	82	86	83	82
Extracted ISTD $^{13}C_4$ PFOS	%	80	76	82	78
Extracted ISTD $^{13}C_4$ PFBA	%	36	40	39	41

PFAS in Waters Trace Extended					
Our Reference		330183-1	330183-2	330183-3	330183-4
Your Reference	UNITS	MW1	MW2	MW3	SDUP1
Date Sampled		10/08/2023	10/08/2023	10/08/2023	10/08/2023
Type of sample		Water	Water	Water	Water
Extracted ISTD $^{13}C_3$ *PFPeA*	%	71	80	70	73
Extracted ISTD $^{13}C_2$ *PFHxA*	%	73	75	69	73
Extracted ISTD $^{13}C_4$ *PFHpA*	%	72	76	72	73
Extracted ISTD $^{13}C_4$ *PFOA*	%	108	117	108	108
Extracted ISTD $^{13}C_5$ *PFNA*	%	74	72	72	72
Extracted ISTD $^{13}C_2$ *PFDA*	%	95	90	99	93
Extracted ISTD $^{13}C_2$ *PFUnDA*	%	95	97	103	100
Extracted ISTD $^{13}C_2$ *PFDoDA*	%	83	86	86	92
Extracted ISTD $^{13}C_2$ *PFTeDA*	%	87	84	85	87
Extracted ISTD $^{13}C_2$ *4:2FTS*	%	105	117	106	116
Extracted ISTD$^{13}C_2$ *6:2FTS*	%	182	187	183	177
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	175	173	187	171
Extracted ISTD $^{13}C_8$ *FOSA*	%	55	52	55	54
Extracted ISTD d_3 *N MeFOSA*	%	101	102	102	99
Extracted ISTD d_5 *N EtFOSA*	%	99	100	100	98
Extracted ISTD d_7 *N MeFOSE*	%	100	97	99	101
Extracted ISTD d_9 *N EtFOSE*	%	90	93	91	89
Extracted ISTD d_3 *N MeFOSAA*	%	120	107	131	137
Extracted ISTD d_5 *N EtFOSAA*	%	128	129	146	131
Total Positive PFHxS & PFOS	µg/L	0.051	0.022	0.061	0.050
Total Positive PFOS & PFOA	µg/L	0.069	0.028	0.075	0.067
Total Positive PFAS	µg/L	0.21	0.095	0.25	0.21

PFAS in Water TRACE Short			
Our Reference		330183-5	330183-6
Your Reference	UNITS	TB-W1	FR-W1
Date Sampled		10/08/2023	10/08/2023
Type of sample		Water	Water
Date prepared	-	11/08/2023	11/08/2023
Date analysed	-	11/08/2023	11/08/2023
Perfluorohexanesulfonic acid - PFHxS	µg/L	<0.0002	<0.0002
Perfluorooctanesulfonic acid PFOS	µg/L	<0.0002	<0.0002
Perfluorooctanoic acid PFOA	µg/L	<0.0002	<0.0002
6:2 FTS	µg/L	<0.0004	<0.0004
8:2 FTS	µg/L	<0.0004	<0.0004
Surrogate $^{13}C_8$ *PFOS*	%	105	103
Surrogate $^{13}C_2$ *PFOA*	%	104	104
Extracted ISTD $^{18}O_2$ *PFHxS*	%	86	85
Extracted ISTD $^{13}C_4$ *PFOS*	%	70	78
Extracted ISTD $^{13}C_4$ *PFOA*	%	102	103
Extracted ISTD $^{13}C_2$ *6:2FTS*	%	141	149
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	159	191
Total Positive PFHxS & PFOS	µg/L	<0.0002	<0.0002
Total Positive PFOS & PFOA	µg/L	<0.0002	<0.0002
Total Positive PFAS	µg/L	<0.0002	<0.0002

Method ID	Methodology Summary
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell at 25°C in accordance with APHA latest edition 2510 and Rayment & Lyons.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Metals-022	Determination of various metals by ICP-MS. 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.
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.
Org-029	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLPs/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.4 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

QUALITY CONTROL: VOCs in water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			11/08/2023	2	11/08/2023	14/08/2023		11/08/2023	[NT]
Date analysed	-			14/08/2023	2	14/08/2023	15/08/2023		14/08/2023	[NT]
Dichlorodifluoromethane	µg/L	10	Org-023	<10	2	<10	<10	0	[NT]	[NT]
Chloromethane	µg/L	10	Org-023	<10	2	<10	<10	0	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-023	<10	2	<10	<10	0	[NT]	[NT]
Bromomethane	µg/L	10	Org-023	<10	2	<10	<10	0	[NT]	[NT]
Chloroethane	µg/L	10	Org-023	<10	2	<10	<10	0	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-023	<10	2	<10	<10	0	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-023	<1	2	<1	<1	0	102	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
Chloroform	µg/L	1	Org-023	<1	2	2	2	0	102	[NT]
2,2-dichloropropane	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-023	<1	2	<1	<1	0	104	[NT]
1,1,1-trichloroethane	µg/L	1	Org-023	<1	2	<1	<1	0	103	[NT]
1,1-dichloropropene	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
Cyclohexane	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
Benzene	µg/L	1	Org-023	<1	2	3	3	0	[NT]	[NT]
Dibromomethane	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
Trichloroethene	µg/L	1	Org-023	<1	2	<1	<1	0	102	[NT]
Bromodichloromethane	µg/L	1	Org-023	<1	2	<1	<1	0	100	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
Toluene	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
1,3-dichloropropane	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-023	<1	2	<1	<1	0	99	[NT]
1,2-dibromoethane	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-023	<1	2	<1	<1	0	105	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
Bromoform	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
m+p-xylene	µg/L	2	Org-023	<2	2	<2	<2	0	[NT]	[NT]
Styrene	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]

QUALITY CONTROL: VOCs in water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
o-xylene	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
1,2,3-trichloropropane	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
Isopropylbenzene	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
Bromobenzene	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
n-propyl benzene	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
1,3,5-trimethyl benzene	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
Tert-butyl benzene	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
1,2,4-trimethyl benzene	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
Sec-butyl benzene	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
4-isopropyl toluene	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
n-butyl benzene	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	102	2	102	103	1	96	[NT]
Surrogate toluene-d8	%		Org-023	96	2	95	97	2	97	[NT]
Surrogate 4-BFB	%		Org-023	107	2	107	106	1	99	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			11/08/2023	2	11/08/2023	14/08/2023		11/08/2023	[NT]
Date analysed	-			14/08/2023	2	14/08/2023	15/08/2023		14/08/2023	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	2	<10	<10	0	107	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	2	<10	<10	0	107	[NT]
Benzene	µg/L	1	Org-023	<1	2	3	3	0	105	[NT]
Toluene	µg/L	1	Org-023	<1	2	<1	<1	0	104	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	2	<1	<1	0	109	[NT]
m+p-xylene	µg/L	2	Org-023	<2	2	<2	<2	0	109	[NT]
o-xylene	µg/L	1	Org-023	<1	2	<1	<1	0	107	[NT]
Naphthalene	µg/L	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	102	2	102	103	1	96	[NT]
Surrogate toluene-d8	%		Org-023	96	2	95	97	2	97	[NT]
Surrogate 4-BFB	%		Org-023	107	2	107	106	1	99	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	330183-2
Date extracted	-			11/08/2023	1	11/08/2023	11/08/2023		11/08/2023	11/08/2023
Date analysed	-			12/08/2023	1	12/08/2023	12/08/2023		11/08/2023	12/08/2023
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	1	<50	<50	0	102	112
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	1	<100	<100	0	102	119
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	1	<100	<100	0	114	106
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	1	<50	<50	0	102	112
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	1	<100	<100	0	102	119
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	1	<100	<100	0	114	106
Surrogate o-Terphenyl	%		Org-020	85	1	105	89	16	122	120

QUALITY CONTROL: PAHs in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	330183-2
Date extracted	-			11/08/2023	1	11/08/2023	11/08/2023		11/08/2023	11/08/2023
Date analysed	-			11/08/2023	1	11/08/2023	11/08/2023		11/08/2023	11/08/2023
Naphthalene	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	74	110
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	74	99
Fluorene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	70	98
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	75	101
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	77	106
Pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	77	114
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	74	100
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	86	131
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	88	1	114	101	12	90	108

QUALITY CONTROL: HM in water - dissolved					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date prepared	-			11/08/2023	1	11/08/2023	11/08/2023		11/08/2023	[NT]
Date analysed	-			11/08/2023	1	11/08/2023	11/08/2023		11/08/2023	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	98	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	1	<0.1	<0.1	0	97	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	1	2	2	0	97	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	1	6	5	18	95	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	99	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	1	<0.05	[NT]		103	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	1	1	<1	0	96	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	1	17	16	6	96	[NT]

QUALITY CONTROL: HM in water - dissolved					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	2	11/08/2023	11/08/2023		[NT]	[NT]
Date analysed	-			[NT]	2	11/08/2023	11/08/2023		[NT]	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	[NT]	2	1	[NT]		[NT]	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	[NT]	2	<0.1	[NT]		[NT]	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	[NT]	2	2	[NT]		[NT]	[NT]
Copper-Dissolved	µg/L	1	Metals-022	[NT]	2	7	[NT]		[NT]	[NT]
Lead-Dissolved	µg/L	1	Metals-022	[NT]	2	1	[NT]		[NT]	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	[NT]	2	<0.05	<0.05	0	[NT]	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	[NT]	2	2	[NT]		[NT]	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	[NT]	2	23	[NT]		[NT]	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			10/08/2023	[NT]	[NT]	[NT]	[NT]	10/08/2023	[NT]
Date analysed	-			10/08/2023	[NT]	[NT]	[NT]	[NT]	10/08/2023	[NT]
pH	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	104	[NT]
Electrical Conductivity	µS/cm	1	Inorg-002	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]

QUALITY CONTROL: PFAS in Waters Trace Extended					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	330183-2
Date prepared	-			11/08/2023	1	11/08/2023	11/08/2023		11/08/2023	11/08/2023
Date analysed	-			11/08/2023	1	11/08/2023	11/08/2023		11/08/2023	11/08/2023
Perfluorobutanesulfonic acid	µg/L	0.0004	Org-029	<0.0004	1	0.0082	0.0082	0	106	109
Perfluoropentanesulfonic acid	µg/L	0.001	Org-029	<0.001	1	<0.001	<0.001	0	106	109
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.0002	Org-029	<0.0002	1	0.0085	0.0086	1	106	105
Perfluoroheptanesulfonic acid	µg/L	0.001	Org-029	<0.001	1	0.001	0.001	0	106	112
Perfluorooctanesulfonic acid PFOS	µg/L	0.0002	Org-029	<0.0002	1	0.042	0.039	7	105	100
Perfluorodecanesulfonic acid	µg/L	0.002	Org-029	<0.002	1	<0.002	<0.002	0	72	68
Perfluorobutanoic acid	µg/L	0.002	Org-029	<0.002	1	0.025	0.025	0	100	105
Perfluoropentanoic acid	µg/L	0.002	Org-029	<0.002	1	0.040	0.041	2	98	96
Perfluorohexanoic acid	µg/L	0.0004	Org-029	<0.0004	1	0.043	0.042	2	106	102
Perfluoroheptanoic acid	µg/L	0.0004	Org-029	<0.0004	1	0.014	0.013	7	107	108
Perfluorooctanoic acid PFOA	µg/L	0.0002	Org-029	<0.0002	1	0.027	0.025	8	102	92
Perfluorononanoic acid	µg/L	0.001	Org-029	<0.001	1	0.003	0.003	0	115	139
Perfluorodecanoic acid	µg/L	0.002	Org-029	<0.002	1	<0.002	<0.002	0	108	98
Perfluoroundecanoic acid	µg/L	0.002	Org-029	<0.002	1	<0.002	<0.002	0	105	105
Perfluorododecanoic acid	µg/L	0.005	Org-029	<0.005	1	<0.005	<0.005	0	111	99
Perfluorotridecanoic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	97	106
Perfluorotetradecanoic acid	µg/L	0.05	Org-029	<0.05	1	<0.05	<0.05	0	97	107
4:2 FTS	µg/L	0.001	Org-029	<0.001	1	<0.001	<0.001	0	113	103
6:2 FTS	µg/L	0.0004	Org-029	<0.0004	1	<0.0004	<0.0004	0	101	92
8:2 FTS	µg/L	0.0004	Org-029	<0.0004	1	<0.0004	<0.0004	0	100	107
10:2 FTS	µg/L	0.002	Org-029	<0.002	1	<0.002	<0.002	0	97	98
Perfluorooctane sulfonamide	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	100	106
N-Methyl perfluorooctane sulfonamide	µg/L	0.05	Org-029	<0.05	1	<0.05	<0.05	0	111	110
N-Ethyl perfluorooctanesulfon amide	µg/L	0.1	Org-029	<0.1	1	<0.1	<0.1	0	107	106
N-Me perfluorooctanesulfonamid oethanol	µg/L	0.05	Org-029	<0.05	1	<0.05	<0.05	0	117	133
N-Et perfluorooctanesulfonamid oethanol	µg/L	0.5	Org-029	<0.5	1	<0.5	<0.5	0	129	132
MePerfluorooctanesulf- amid oacetic acid	µg/L	0.002	Org-029	<0.002	1	<0.002	<0.002	0	102	98
EtPerfluorooctanesulf- amid oacetic acid	µg/L	0.002	Org-029	<0.002	1	<0.002	<0.002	0	119	114
Surrogate $^{13}C_8$ *PFOS*	%		Org-029	98	1	101	97	4	100	102
Surrogate $^{13}C_2$ *PFOA*	%		Org-029	101	1	102	106	4	96	106

QUALITY CONTROL: PFAS in Waters Trace Extended					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	330183-2
Extracted ISTD $^{13}C_3$ *PFBS*	%		Org-029	83	1	76	76	0	85	74
Extracted ISTD $^{18}O_2$ *PFHxS*	%		Org-029	89	1	82	80	2	87	82
Extracted ISTD $^{13}C_4$ *PFOS*	%		Org-029	80	1	80	79	1	78	76
Extracted ISTD $^{13}C_4$ *PFBA*	%		Org-029	109	1	36	39	8	107	41
Extracted ISTD $^{13}C_3$ *PFPeA*	%		Org-029	100	1	71	70	1	100	75
Extracted ISTD $^{13}C_2$ *PFHxA*	%		Org-029	99	1	73	73	0	98	74
Extracted ISTD $^{13}C_4$ *PFHpA*	%		Org-029	89	1	72	74	3	87	72
Extracted ISTD $^{13}C_4$ *PFOA*	%		Org-029	107	1	108	108	0	106	107
Extracted ISTD $^{13}C_5$ *PFNA*	%		Org-029	82	1	74	70	6	83	70
Extracted ISTD $^{13}C_2$ *PFDA*	%		Org-029	89	1	95	89	7	86	90
Extracted ISTD $^{13}C_2$ *PFUnDA*	%		Org-029	91	1	95	94	1	88	87
Extracted ISTD $^{13}C_2$ *PFDoDA*	%		Org-029	83	1	83	81	2	78	83
Extracted ISTD $^{13}C_2$ *PFTeDA*	%		Org-029	73	1	87	80	8	60	83
Extracted ISTD $^{13}C_2$ *4:2FTS*	%		Org-029	117	1	105	108	3	114	109
Extracted ISTD$^{13}C_2$ *6:2FTS*	%		Org-029	137	1	182	171	6	146	161
Extracted ISTD $^{13}C_2$ *8:2FTS*	%		Org-029	167	1	175	171	2	155	156
Extracted ISTD $^{13}C_8$ *FOSA*	%		Org-029	65	1	55	55	0	64	52
Extracted ISTD d_3 *N MeFOSA*	%		Org-029	97	1	101	102	1	94	102
Extracted ISTD d_5 *N EtFOSA*	%		Org-029	99	1	99	102	3	96	100
Extracted ISTD d_7 *N MeFOSE*	%		Org-029	95	1	100	100	0	95	97

QUALITY CONTROL: PFAS in Waters Trace Extended						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	330183-2
Extracted ISTD d_9 *N EtFOSE*	%		Org-029	96	1	90	92	2	90	93
Extracted ISTD d_3 *N MeFOSAA*	%		Org-029	109	1	120	125	4	105	102
Extracted ISTD d_5 *N EtFOSAA*	%		Org-029	130	1	128	121	6	122	124

QUALITY CONTROL: PFAS in Water TRACE Short					Duplicate					Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			11/08/2023	[NT]	[NT]	[NT]	[NT]	11/08/2023	[NT]
Date analysed	-			11/08/2023	[NT]	[NT]	[NT]	[NT]	11/08/2023	[NT]
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.0002	Org-029	<0.0002	[NT]	[NT]	[NT]	[NT]	102	[NT]
Perfluorooctanesulfonic acid PFOS	µg/L	0.0002	Org-029	<0.0002	[NT]	[NT]	[NT]	[NT]	110	[NT]
Perfluorooctanoic acid PFOA	µg/L	0.0002	Org-029	<0.0002	[NT]	[NT]	[NT]	[NT]	104	[NT]
6:2 FTS	µg/L	0.0004	Org-029	<0.0004	[NT]	[NT]	[NT]	[NT]	103	[NT]
8:2 FTS	µg/L	0.0004	Org-029	<0.0004	[NT]	[NT]	[NT]	[NT]	101	[NT]
Surrogate $^{13}C_8$ *PFOS*	%		Org-029	99	[NT]	[NT]	[NT]	[NT]	102	[NT]
Surrogate $^{13}C_2$ *PFOA*	%		Org-029	104	[NT]	[NT]	[NT]	[NT]	104	[NT]
Extracted ISTD $^{18}O_2$ *PFHxS*	%		Org-029	87	[NT]	[NT]	[NT]	[NT]	89	[NT]
Extracted ISTD $^{13}C_4$ *PFOS*	%		Org-029	78	[NT]	[NT]	[NT]	[NT]	75	[NT]
Extracted ISTD $^{13}C_4$ *PFOA*	%		Org-029	101	[NT]	[NT]	[NT]	[NT]	100	[NT]
Extracted ISTD$^{13}C_2$ *6:2FTS*	%		Org-029	137	[NT]	[NT]	[NT]	[NT]	132	[NT]
Extracted ISTD $^{13}C_2$ *8:2FTS*	%		Org-029	167	[NT]	[NT]	[NT]	[NT]	174	[NT]

Result Definitions

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

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

Report Comments

For PFAS Extracted Internal Standards denoted with # or outside the 50-150% acceptance range, the respective target analyte results may be unaffected, in other circumstances the PQL has been raised to accommodate the outlier(s).

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

SAMPLE RECEIPT ADVICE

Client Details	
Client	JK Environments
Attention	Vittal Boggaram

Sample Login Details	
Your reference	E34303B, Potts Point
Envirolab Reference	330183
Date Sample Received	10/08/2023
Date Instructions Received	10/08/2023
Date Results Expected to be Reported	17/08/2023

Sample Condition	
Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	6 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	6
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:

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
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Sample ID	VOCs in water	vTRH(C6-C10)/BTEXN in Water	svTRH (C10-C40) in Water	PAHs in Water	HM in water - dissolved	pH	Electrical Conductivity	PFAS in Waters Trace Extended	PFAS in Water TRACE Short
MW1	✓	✓	✓	✓	✓	✓	✓	✓	
MW2	✓	✓	✓	✓	✓	✓	✓	✓	
MW3	✓	✓	✓	✓	✓	✓	✓	✓	
SDUP1	✓	✓	✓	✓	✓			✓	
TB-W1		✓	✓	✓	✓				✓
FR-W1		✓	✓	✓	✓				✓

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

Additional Info

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

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

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

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

SAMPLE AND CHAIN OF CUSTODY FORM

TO: ENVIROLAB SERVICES PTY LTD 12 ASHLEY STREET CHATSWOOD NSW 2067 P: (02) 99106200 F: (02) 99106201 Attention: Aileen	JKE Job Number: E34303B Date Results Required: STANDARD Page: 1 of 1	**FROM:** JKEnvironments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: Vittal Boggaram vboggaram@jkenvironments.com.au

Location: Potts Point — Sample Preserved in Esky on Ice

Sampler: AD/CB — Tests Required

Date Sampled	Lab Ref:	Sample Number	Sample Containers	PID	Sample Description	Combo 3L	VOCs	pH/EC	PFAS - trace extended	PFAS - trace short	BTEX						
10/08/2023	1	MW1	G, H, PVC, Vx4, Px2		Water	X	X	X	X								
10/08/2023	2	MW2	G, H, PVC, Vx4, Px2		Water	X	X	X	X								
10/08/2023	3	MW3	G, H, PVC, Vx4, Px2		Water	X	X	X	X								
10/08/2023	4	SDUP1	G, H, PVC, Vx4, Px2	-	Duplicate	X	X		X								
10/08/2023		**SDUP2	G, H, PVC, Vx4, Px2	-	Duplicate	X	X		X								
10/08/2023	5	TB-W1	G, H, Vx2, P	-	Trip Blank	X				X							
10/08/2023	NR	TS-W1	V	-	Trip Spike						X						
10/08/2023	6	FR-W1	G, H, Vx2, P	-	Field Rinsate	X				X							

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200
ENVIROLAB
Job No: 330183
Date Received: 10/8/23
Time Received: 14:00
Received By: AD
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Remarks (comments/detection limits required): All analysis PQLs to ANZECC (2000) Detection Limits Please **Please sent to VIC as interlab duplicate	Sample Containers: G - 500mL Amber Glass Bottle V - BTEX Vial H - HNO3 Wash PVC PVC - HDPE Plastic Bottles P - PFAS bottle

Relinquished By:	Date: 10-08-23	Time: 4pm	Received By:	Date:
VB				

Appendix F: Report Explanatory Notes

QA/QC Definitions

The QA/QC terms used in this report are defined below. The definitions are in accordance with US EPA publication SW-846, entitled *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (1994)[16] methods and those described in *Environmental Sampling and Analysis, A Practical Guide,* (1991)[17]. The NEPM (2013) is consistent with these documents.

A. Practical Quantitation Limit (PQL), Limit of Reporting (LOR) & Estimated Quantitation Limit (EQL)

These terms all refer to the concentration above which results can be expressed with a minimum 95% confidence level. The laboratory reporting limits are generally set at ten times the standard deviation for the Method Detection Limit for each specific analyte. For the purposes of this report the LOR, PQL, and EQL are considered to be equivalent.

When assessing laboratory data it should be borne in mind that values at or near the PQL have two important limitations: *"The uncertainty of the measurement value can approach, and even equal, the reported value. Secondly, confirmation of the analytes reported is virtually impossible unless identification uses highly selective methods. These issues diminish when reliably measurable amounts of analytes are present. Accordingly, legal and regulatory actions should be limited to data at or above the reliable detection limit*" (Keith, 1991).

B. Precision

The degree to which data generated from repeated measurements differ from one another due to random errors. Precision is measured using the standard deviation or Relative Percent Difference (RPD).

C. Accuracy

Accuracy is a measure of the agreement between an experimental result and the true value of the parameter being measured (i.e. the proximity of an averaged result to the true value, where all random errors have been statistically removed). The assessment of accuracy for an analysis can be achieved through the analysis of known reference materials or assessed by the analysis of surrogates, field blanks, trip spikes and matrix spikes. Accuracy is typically reported as percent recovery.

D. Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness is primarily dependent upon the design and implementation of the sampling program. Representativeness of the data is partially ensured by the avoidance of contamination, adherence to sample handing and analysis protocols and use of proper chain-of-custody and documentation procedures.

E. Completeness

Completeness is a measure of the number of valid measurements in a data set compared to the total number of measurements made and overall performance against DQIs. The following information is assessed for completeness:

- Chain-of-custody forms;
- Sample receipt form;
- All sample results reported;
- All blank data reported;

[16] US EPA, (1994). *SW-846: Test Methods for Evaluating Solid Waste, Physical/Chemical Methods.* (US EPA SW-846)
[17] Keith., H, (1991). *Environmental Sampling and Analysis, A Practical Guide*

- All laboratory duplicate and RPDs calculated;
- All surrogate spike data reported;
- All matrix spike and lab control spike (LCS) data reported and RPDs calculated;
- Spike recovery acceptable limits reported; and
- NATA stamp on reports.

F. <u>Comparability</u>

Comparability is the evaluation of the similarity of conditions (e.g. sample depth, sample homogeneity) under which separate sets of data are produced. Data comparability checks include a bias assessment that may arise from the following sources:

- Collection and analysis of samples by different personnel; Use of different techniques;
- Collection and analysis by the same personnel using the same methods but at different times; and
- Spatial and temporal changes (due to environmental dynamics).

G. <u>Blanks</u>

The purpose of laboratory and field blanks is to check for artefacts and interferences that may arise during sampling, transport and analysis.

H. <u>Matrix Spikes</u>

Samples are spiked with laboratory grade standards to detect interactive effects between the sample matrix and the analytes being measured. Matrix Spikes are reported as a percent recovery and are prepared for 1 in every 20 samples. Sample batches that contain less than 20 samples may be reported with a Matrix Spike from another batch. The percent recovery is calculated using the formula below. Acceptable recovery limits are 70% to 130%.

$$\frac{(\text{Spike Sample Result} - \text{Sample Result}) \times 100}{\text{Concentration of Spike Added}}$$

I. <u>Surrogate Spikes</u>

Samples are spiked with a known concentration of compounds that are chemically related to the analyte being investigated but unlikely to be detected in the environment. The purpose of the Surrogate Spikes is to check the accuracy of the analytical technique. Surrogate Spikes are reported as percent recovery.

J. <u>Duplicates</u>

Laboratory duplicates measure precision, expressed as Relative Percent Difference. Duplicates are prepared from a single field sample and analysed as two separate extraction procedures in the laboratory. The RPD is calculated using the formula where D1 is the sample concentration and D2 is the duplicate sample concentration:

$$\frac{(D1 - D2) \times 100}{\{(D1 + D2)/2\}}$$

Appendix G: Data (QA/QC) Evaluation

Data (QA/QC) Evaluation

A. INTRODUCTION

This Data (QA/QC) Evaluation forms part of the validation process for the DQOs documented in the SAQP attached to this report. Checks were made to assess the data in terms of precision, accuracy, representativeness, comparability and completeness. These 'PARCC' parameters are referred to collectively as DQIs and are defined in the Report Explanatory Notes attached in the report appendices.

1. Field and Laboratory Considerations

The quality of the analytical data produced for this project has been considered in relation to the following:

- Sample collection, storage, transport and analysis;
- Laboratory PQLs;
- Field QA/QC results; and
- Laboratory QA/QC results.

2. Field QA/QC Samples and Analysis

The results for the field QA/QC samples are detailed in the laboratory summary tables (Tables QS1, QW1, QSV4, PQS1 and PQW1 inclusive) attached to the investigation report and are discussed in the subsequent sections of this Data (QA/QC) Evaluation report. A summary of the field QA/QC samples collected and analysed for this investigation is provided in the following table:

Sample Type	Number Analysed	Frequency (of Sample Type)
Intra-laboratory duplicate (soil)	2	Approximately 15% of primary samples
Inter-laboratory duplicate (soil)	2	As above
Intra-laboratory duplicate (groundwater)	1	Approximately 33% of primary samples
Inter-laboratory duplicate (groundwater)	1	As above
Intra-laboratory duplicate (soil vapour)	1	Approximately 20% of primary samples
Trip spikes Soil Water	 2 1	One per day of soil sampling
Trip blanks Soil Water	 2 1	One per day of soil sampling
Rinsates Soil SPT Groundwater Interphase Probe	 2 1	One per day of soil sampling

Sample Type	Number Analysed	Frequency (of Sample Type)
Shroud Leak Test (soil vapour)	1	One for the investigation for leak test verification purposes.

3. Data Assessment Criteria

JKE adopted the following criteria for assessing the field and laboratory QA/QC analytical results:

Field Duplicates

Acceptable targets for precision of field duplicates in this report will be 30% or less, consistent with NEPM (2013). RPD failures will be considered qualitatively on a case-by-case basis taking into account factors such as the concentrations used to calculate the RPD (i.e. RPD exceedance where concentrations are close to the PQL are typically not as significant as those where concentrations are reported at least five or 10 times the PQL), sample type, collection methods and the specific analyte where the RPD exceedance was reported.

Field/Trip Blanks and Rinsates

Acceptable targets for field blank and rinsate samples in this report will be less than the PQL for organic analytes. Metals will be considered on a case-by-case basis with regards to typical background concentrations in soils and published drinking water guidelines for waters.

Trip Spikes

Acceptable targets for trip spike samples in this report will be 70% to 130%.

Isopropanol Shroud

The isopropanol shroud sample is used for leak test purposes. The shroud sample intends to demonstrate a high isopropanol concentration, then the soil vapour samples ideally should not detect high concentrations of isopropanol. A significant (>10mg/m^3 or >10,000µg/m^3) detection of isopropanol in the soil vapour samples may indicate a leak in the installation and suggest that ambient air is being drawn into the installation during sampling.

Laboratory QA/QC

The suitability of the laboratory data is assessed against the laboratory QA/QC criteria which is outlined in the laboratory reports. These criteria were developed and implemented in accordance with the laboratory's NATA accreditation and align with the acceptable limits for QA/QC samples as outlined in NEPM (2013) and other relevant guidelines.

A summary of the acceptable limits adopted by the primary laboratory (Envirolab) is provided below:

RPDs

- Results that are <5 times the PQL, any RPD is acceptable; and
- Results >5 times the PQL, RPDs between 0-50% are acceptable.

Laboratory Control Samples (LCS) and Matrix Spikes

- 70-130% recovery acceptable for metals and inorganics;
- 60-140% recovery acceptable for organics; and
- 10-140% recovery acceptable for VOCs.

Surrogate Spikes

- 60-140% recovery acceptable for general organics; and
- 10-140% recovery acceptable for VOCs.

Method Blanks

- All results less than PQL.

B. <u>DATA EVALUATION</u>

1. <u>Sample Collection, Storage, Transport and Analysis</u>

Samples were collected by trained field staff in accordance with our standard sampling procedures. Field sampling procedures were designed to be consistent with relevant guidelines, including NEPM (2013) and other guidelines made under the CLM Act 1997.

Appropriate sample preservation, handling and storage procedures were adopted. With the exception of pH analysis of soil samples (Envirolab report 329662-A), laboratory analysis was undertaken within specified holding times generally in accordance with Schedule B(3) of NEPM (2013) and the laboratory NATA accredited methodologies. The soil pH analysis was undertaken out of holding time. All samples were preserved either on ice when in the field or in fridges at the JKE office or laboratory prior to analysis. On this basis, the impacts to precision and accuracy are not considered to be significant and do not impact the report conclusions.

JKE note that the temperature on receipt of soil samples was reported to be up to 12.2°C. JKE understand that the temperature is measured at the laboratory using an infrared temperature probe by scanning the outside of the sample container (i.e. one sample jar/container at the time of registering the samples). This procedure is not considered to be robust as there is a potential for the outside of the jar to warm to ambient temperature, or at least to increase from that of the internal contents, relatively quickly. On this basis, JKE is of the opinion that the temperatures reported on the Sample Receipts are unlikely to be reliable or representative of the overall batch. This is further supported by the trip spike recovery results (discussed further below) which reported adequate recovery in the range of 96% to 101%.

Envirolab noted that the asbestos results were reported to be consistent with the recommendations in NEPM (2013), however this level of reporting is outside the scope of their NATA accreditation. In the absence of other available analytical methods for asbestos, this was found to be acceptable for the purpose of this investigation.

Review of the project data also indicated that:

- COC documentation was adequately maintained;
- Sample receipt advice documentation was provided for all sample batches;
- All analytical results were reported; and

- Consistent units were used to report the analysis results. Some conversion of the soil vapour data results occurred in the summary tables to allow direct comparison with the same units for the NEPM (2013) SAC.

2. Laboratory PQLs

Appropriate PQLs were adopted for the analysis and all PQLs were below the SAC, with the exception of the anthracene PQL for groundwater analysis which was 10 times greater than the ecological SAC, vinyl chloride, hexachlorobutadiene and benzo(a)pyrene which were all greater than the health based SAC for groundwater (relating to the ADWG/HSL-SSA SAC). In light of the PAH and VOC concentrations reported for soil and groundwater, JKE is of the opinion that this is not significant, and it does not affect the quality of the dataset as a whole or the outcome of the investigation.

The PQL for PFHxA, MeFOSAA and EtFOSAA, PFAS compounds was raised in Envirolab report 38969 due to sample matrix requiring dilution by the lab. JKE is of the opinion that this is not significant as all of the PFAS results were below the SAC.

3. Field QA/QC Sample Results

Field Duplicates

The results indicated that field precision was acceptable. RPD non-conformances were reported for some analytes as discussed below:

- Elevated RPDs were reported for several PAHs, selected metals, selected TRHs, selected PFAS and PCBs in the primary and field duplicate soil samples analysed for the DSI;
- Elevated RPDs were reported for individual metals and PFAS in the primary and field duplicate groundwater samples analysed for the DSI; and
- Elevated RPDs were reported for individual TRHs and selected VOCs in the primary and field duplicate soil vapour samples analysed for the DSI.

Values outside the acceptable limits have been attributed to the following:

- Sample heterogeneity and the difficulties associated with obtaining homogenous duplicate samples of heterogeneous matrices; and
- Results being very close to the PQLs.

For the DSI, the primary and duplicate values have been assessed against the SAC (see attached report tables). Where concentrations in duplicate samples are above the SAC, they have been reported along with elevations in the primary samples and considered in the risk assessment. In our opinion this approach is conservative and results in no data being excluded from the risk assessment process.

Field/Trip Blanks

The soil field blank analysis results were all less than the PQLs with the exception of chromium, lead and zinc with reported concentrations at or below 5mg/kg. Low level metals concentrations are typical in washed sand which is utilised as blank material. In JKE's experience, the concentrations reported were consistent with background concentrations in a sand matrix and were not indicative of cross-contamination. On this basis, cross contamination between samples that may have significance for data validity did not occur.

The groundwater field blank analysis results were all less than the PQLs.

Rinsates

The majority of the results were below the PQL. This indicated that significant cross-contamination artefacts associated with sampling equipment were not present and the potential for significant cross-contamination to have occurred was low.

Hand auger rinsate sample FR2-HA detected low concentrations of TRH and copper. Groundwater rinsate sample FR-W1 encountered low detections of TRH and selected metals. The detectable concentration of light fraction TRH is most likely attributed to trihalomethanes. These compounds are breakdown products from the chlorination process and are common in potable water at the concentration reported (the Australian drinking water guideline for total trihalomethanes is 250µg/L). The detection of low-level metals is common in potable water used for rinsing field equipment.

Trip Spikes

The soil trip spike results ranged from 96% to 101% and indicated that field preservation methods were appropriate.

The water trip spike results ranged from 103% to 113% and indicated that field preservation methods were appropriate.

Soil Vapour Installations (Leak Tests)

The isopropanol shroud sample (carbon tube) reported a concentration of 860mg/m^3. The isopropanol result in the corresponding soil vapour sample SV5 was 0.51mg/m^3 (510µg/m^3). The results were below the criterion of 10mg/m^3. The isopropanol result in all soil vapour samples were all well below the 10mg/m^3 threshold. This demonstrated the leak test was successful.

4. Laboratory QA/QC

The analytical methods implemented by the laboratory were performed in accordance with their NATA accreditation and were consistent with Schedule B(3) of NEPM (2013). The frequency of data reported for the laboratory QA/QC (i.e. duplicates, spikes, blanks, LCS) was considered to be acceptable for the purpose of this investigation. A review of the laboratory QA/QC data identified the following minor non-conformances:

Envirolab Report 38969:

- For PFAS testing denoted with # or outside the 50-150% acceptance range, the lab indicated that the respective target analyte results may be unaffected and in other circumstances the PQL has been raised to accommodate the outlier(s). PQLs were raised for the following PFAS compounds PFHxA, MeFOSAA and EtFOSAA due to sample matrix requiring dilution.

Envirolab Report 329662:

- For PFAS testing denoted with # or outside the 50-150% acceptance range, the lab indicated that the respective target analyte results may be unaffected and in other circumstances the PQL has been raised to accommodate the outlier(s); and

- A portion of the supplied Sample 329662-6 was sub-sampled for asbestos testing according to Australian Standard asbestos subsampling procedure as 500mL NEPM sample could not be obtained of the sandstone bedrock.

Envirolab Report 329662-A:

- Samples were out of the recommended holding time for pH analysis in soil. This has been discussed above.

Envirolab Report 39094:

- PFAS in groundwater samples was analysed by Envirolab Sydney, report 330647. JKE understand that the analysis was undertaken by the Sydney lab to achieve the trace level detection limits required to assess the results against the guidelines. Since all of the results were well below the SAC, the quality of the laboratory data was considered to be acceptable.

Envirolab Report 330183:

- For PFAS testing denoted with # or outside the 50-150% acceptance range, the lab indicated that the respective target analyte results may be unaffected and in other circumstances the PQL has been raised to accommodate the outlier(s).

Overall, the quality of the laboratory data was considered to be acceptable.

C. <u>DATA QUALITY SUMMARY</u>

JKE is of the opinion that the data are adequately precise, accurate, representative, comparable and complete to serve as a basis for interpretation to achieve the investigation objectives.

Non-conformances were reported for some field QA/QC samples. These non-conformances were considered to be sporadic and minor, and were not considered to be indicative of systematic sampling or analytical errors. On this basis, these non-conformances are not considered to materially impact the report findings.

There was only one groundwater monitoring event and soil vapour sampling event undertaken for the investigation. On this basis there is some uncertainty around the representativeness of the groundwater and soil vapour data, particularly during different climatic conditions and after wet/dry periods. This has been considered in the data gaps assessment and in drawing conclusions and making recommendations.

Appendix H: Field Work Documents

JKE SAQP

REPORT TO

TIME AND PLACE

ON

SAMPLING ANALYSIS QUALITY PLAN FOR DETAILED SITE INVESTIGATION

FOR

PROPOSED RESIDENTIAL DEVELOPMENT

AT

45-53 MACLEAY STREET, POTTS POINT, NSW

Date: 31 July 2023

Ref: E34303Brpt2-SAQP

JKEnvironments

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Report prepared by:

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For and on behalf of
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NORTH RYDE BC NSW 1670

DOCUMENT REVISION RECORD

Report Reference	Report Status	Report Date
E34303Brpt2-SAQP	Final Report	31 July 2023

This Report (which includes all attachments and annexures) has been prepared by JKE for the Client, and is intended for the use only by that Client.

This Report has been prepared pursuant to a contract between JKE and the Client and is therefore subject to:

a) JKE's proposal in respect of the work covered by the Report;
b) The limitations defined in the client's brief to JKE; and
c) The terms of contract between JKE and the Client, including terms limiting the liability of JKE.

If the Client, or any person, provides a copy of this Report to any third party, such third party must not rely on this Report, except with the express written consent of JKE which, if given, will be deemed to be upon the same terms, conditions, restrictions and limitations as apply by virtue of (a), (b), and (c) above.

Any third party who seeks to rely on this Report without the express written consent of JKE does so entirely at their own risk and to the fullest extent permitted by law, JKE accepts no liability whatsoever, in respect of any loss or damage suffered by any such third party.

Table of Contents

List of Tables

Attachments

Abbreviations

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

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

Units

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

1 INTRODUCTION

Time and Place ('the client') commissioned JK Environments (JKE) to prepare a Sampling Analysis Quality Plan (SAQP) for the Detailed Site Contamination Investigation (DSI) to be undertaken by JKE for the proposed residential development at 45-53 Macleay Street, Potts Point, NSW ('the site'). The site location is shown on Figure 1 and the DSI will be confined to the site boundaries as shown on Figures 2 and 3 attached in the appendices.

This report has been prepared to address the requirement to undertake a DSI outlined under Contention No. 2 of the Land and Environment Court (LEC) proceeding (case number 2023/00115313) with regards to Chapter 4 of State Environmental Planning Policy (Resilience and Hazards) 2021[1] (formerly known as SEPP55).

JKE understand that the client has engaged Ms Rowena Salmon, NSW EPA accredited site auditor to undertake a site audit with regards to the Contaminated Land Management (CLM) Act (1997) [2]. The SAQP should be issued to the auditor for review as part of the audit process.

JKE have previously undertaken a Preliminary Site Investigation (PSI) for the proposed development in September 2021[3]. A summary of this information has been included in Section 2. This report should be read in conjunction with the PSI report.

A geotechnical investigation was previously undertaken by JK Geotechnics (JKG). The results of the geotechnical investigation are presented in a separate report (Ref: 34303Rrpt, dated 26 August 2021)[4]. JKG have been commissioned by the client to undertake additional geotechnical investigation at the site in conjunction with the DSI.

1.1 Proposed Development Details

Based on the review of the architectural drawings (Ref: 6253, dated 3 August 2021, subsequently issues on 13 August 2023), JKE understand that the proposed development includes the construction of a nine-storey mixed-use residential apartment building including ground floor retail areas over two common basement levels. The existing onsite building is to be demolished for the proposed development. The proposed development generally includes commercial (retail), common areas, logistical facilities on the ground floor, and above ground level residential floors including a penthouse and rooftop open space. An electrical sub-station is proposed on the ground floor within the northern area of the site. Landscaped areas are proposed on the ground floor within the south-western and northern areas of the site.

Excavation for the proposed development is anticipated to extent to approximately 7.5m below ground level (BGL) to 8mBGL to achieve the final floor level (FFL) of the lowest basement level at RL 19.9m AHD.

Selected development plans issued to JKE are attached in the appendices.

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

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

[3] JKE (2021). *Report to Time and Place on Preliminary (Stage 1) Site Contamination Investigation for Proposed Boutique Residential Units at 45-53 Macleay Street, Potts Point, NSW.* (Ref: E34303Brpt, dated 10 September 2021) (referred to as JKE PSI)

[4] JKG, (2021). *Report to Time and Place Development Pty Ltd on Preliminary Geotechnical Assessment for Proposed Redevelopment at 45-53 Macleay Street, Potts Point, NSW.* (referred to as JKG report)

1.2 Aims and Objectives

The primary aims of the DSI include: identify any past or present potentially contaminating activities at the site, identify the potential for site contamination, and make an assessment of the soil, soil vapour and groundwater contamination conditions in order to inform site remediation if required.

A secondary aim is to provide preliminary waste classification data for off-site disposal of soil waste which may be generated during the proposed development works.

The DSI objectives are to:

- Provide a summary of the past site use(s) based on a review of the PSI report;
- Assess the current site conditions and use(s) via a site walkover inspection;
- Investigate the potential contamination sources/areas of environmental concern (AEC) and contaminants of potential concern (CoPC) identified in the PSI;
- Assess the soil, soil vapour and groundwater contamination conditions via implementation of a sampling and analysis program;
- Update and reassess the conceptual site model (CSM);
- Assess the potential risks posed by contamination to the receptors identified in the CSM (Tier 1 assessment);
- Assess the potential for acid sulfate soil (ASS) to be disturbed during the proposed development works and if an ASS management plan (ASSMP) is required for the proposed development;
- Provide a preliminary waste classification for off-site disposal of soil;
- Assess whether the site is suitable or can be made suitable for the proposed development (from a contamination viewpoint); and
- Assess whether further intrusive investigation and/or remediation is required.

1.3 Scope of Work

The SAQP has been prepared generally in accordance with a JKE proposal (Ref: EP58656B2) of 1 June 2023 and written acceptance from the client in the form of a Consultancy Agreement.

The scope of work included review of the PSI and preparation of an SAQP with regards to National Environmental Protection (Assessment of Site Contamination) Measure 1999 as amended (2013)[5], other guidelines made under or with regards to the CLM Act 1997 and SEPP Resilience and Hazards 2021.

The ASS assessment will be undertaken with reference to the National Acid Sulfate Soil Guidance (2018) documents and the Acid Sulfate Soil Management Advisory Committee (ASSMAC) Acid Sulfate Soil Manual (1998)[6].

A list of reference documents/guidelines is included in the appendices.

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

[6] Acid Sulfate Soils Management Advisory Committee (ASSMAC), (1998). *Acid Sulfate Soils Manual* (ASS Manual 1998)

2 SITE INFORMATION

2.1 Background

2.1.1 Summary of JKE PSI Report

JKE was commissioned to undertake a PSI for the proposed development. The primary aims of the PSI were to: identify past or present potentially contaminating activities at the site; identify the potential for site contamination; and assess the need for further investigation.

The objectives of the PSI were to:

- Provide an appraisal of the past site use(s) based on a review of historical records;
- Assess the current site conditions and land use by completing a site walkover inspection;
- Identify potential contamination sources/AEC and CoPC;
- Prepare a CSM; and
- Assess whether an intrusive investigation is required.

The scope of works included: review of site information, including background and site history information from various sources outlined in the report; walkover site inspection; and preparation of a PSI report presenting the results of the assessment, including a CSM.

Based on the site history assessment, JKE identified the site and surrounds have historically been used for a mixture of residential and commercial purposes. Historical businesses registered at the site had included a medical practitioner and hotel. In more recent time, the site has been used for activities such as hotel and high-rise residential.

Potential AEC identified at the site included:

- Fill material (i.e. historically imported soil) at the site (entire site);
- Use of pesticides within the site;
- Hazardous building materials within current and former buildings/structures; and
- Current and historical dry cleaners located up-gradient and within close proximity of the site.

The PSI recommended that the following to be undertaken at the site:

- A DSI should be undertaken to characterise the site contamination conditions and establish whether the site is suitable for the proposed development, or whether remediation is required;
- An ASS assessment to establish the potential for actual or potential ASS to be present, and assess the need to prepare an ASSMP; and
- A hazardous building materials survey undertaken prior to demolition of the buildings. Following demolition of the buildings (and preferably prior to removal of the hardstand), an asbestos clearance certificate should be obtained.

The PSI also recommend that a waste classification be undertaken to classify material to be excavated for the proposed development.

2.1.2 Summary of JKG Geotechnical Report

JKG was commissioned to undertake a desktop assessment for the proposed development. The purpose of the assessment was to review JKG database of nearby geotechnical investigations and complete a site inspection.

The report identified the following likely subsurface conditions at the site:

- Sandy fill below the paved surfaces estimated to extent to a depth of approximately 1.5mBGL;
- An intermittent layer of residual clayey or sandy soils of an estimated maximum thickness of approximately 0.5m;
- Below the fill and/or residual soils, weathered sandstone bedrock is expected to be encountered at a maximum depth of approximately 1.5mBGL. On first contact, the sandstone is expected to be of variable quality ranging between extremely weathered and highly weathered and typically of very low to low strength with soil strength bands associated with the extremely weathered bedrock. Below approximately 2m to 4m depth, the sandstone is expected to improve to typically moderately to slightly weathered and of low to medium strength. The defects in the sandstone are expected to comprise sub-horizontal clay seams, extremely weathered seams and steeply inclined joints; and
- Localised very small quantities of groundwater seepage may be encountered within the soil profile at the soil-bedrock interface and possibly along discrete defects within the rock mass.

2.2 Site Identification

Table 2-1: Site Identification

Current Site Owner (certificate of title):	The owners of Strata Plan No. 934
Site Address:	45-53 Macleay Street, Potts Point, NSW
Lot & Deposited Plan:	SP934
Current Land Use:	Residential
Proposed Land Use:	Mixed Use - Residential and commercial (ground floor retail)
Local Government Authority (LGA):	City of Sydney
Current Zoning:	B4 – Mixed use
Site Area (m^2) (approx.):	1,300
RL (AHD in m) (approx.):	27-28
Geographical Location (decimal degrees) (approx. centre of site):	Latitude: -33.86839 Longitude: 151.22548
Site Location and Layout Plans:	Figures 1 and 2

Proposed Sampling Location Plan:	Figure 3

2.3 Site Location and Regional Setting

The site is located in a predominantly residential and commercial area of Potts Point and is bound by Macleay Street to the east and accessed from McDonald Street to the north. The site is located approximately 170m to the west of Elizabeth Bay. Department of Defence facility (HMAS Kuttabul) is located to the north of the site.

2.4 Topography

The regional topography is characterised by a plateau that falls towards the east and west. The regional topography declines steeply towards the east and west at points located approximately 100m away from the site. The site is located on the peak of the plateau and generally falls to the north at approximately 1°-2°. Parts of the site appear to have been levelled to account for the slope and accommodate the existing development.

2.5 Site Inspection

A walkover inspection of the site was undertaken by JKE for the PSI and for preparing the SAQP on 25 May 2023. The inspection was limited to accessible areas of the site and immediate surrounds. An internal inspection of buildings was not undertaken. A summary of the inspection findings is outlined in the following subsections:

2.5.1 Current Site Use and/or Indicators of Former Site Use

At the time of the inspection, the site was occupied by a large residential apartment building including paved common areas used for access and resident vehicle parking. An under-croft parking was located beneath the residential building which provided access to the upper floors of the apartment. No indicators of former site use were observed during the inspection.

2.5.2 Buildings, Structures and Roads

The site was occupied by a ten-storey residential apartment building of concrete construction. With the exception of landscaped areas located along the northern and eastern street frontages, the open areas of the site were concrete paved and used as a car park associated with the residential apartment. Basements were not observed during the inspection. The onsite building and pavements generally appeared in good condition based on a cursory external inspection. There was considered to be a potential for hazardous building materials to be present based on the age of the building.

2.5.3 Boundary Conditions, Soil Stability and Erosion

The site boundaries were defined by adjacent building walls to the south, onsite building wall to the north, landscaped area to the east and steel post fencing to the west. Evidence of soil instability or erosion were not observed onsite during the inspection.

2.5.4 Presence of Drums/Chemical Storage and Waste

Access into the apartment building was not possible during the inspection. However, based on the residential use of the site and the lack of indicators for sources of contamination, JKE are of the opinion that there is unlikely to be drums, significant quantities of chemicals and/or waste stored at the site that may cause potential onsite contamination.

2.5.5 Evidence of Cut and Fill

The site appeared to have been levelled to accommodate for the current development. Based on JKG desktop review, fill is anticipated to be present below the pavements at the site. Fill was also evident in the landscaped areas.

2.5.6 Visible or Olfactory Indicators of Contamination (odours, spills etc)

Visible or olfactory indicators of contamination, including indicators of potential above or underground fuel storage tanks (ASTs/USTs) were not observed the site during the inspection.

2.5.7 Drainage and Services

Surface water generated from rainfall would generally be expected to be intercepted and collected by onsite building guttering and routed to the local stormwater infrastructure. Excess rainfall forming overland flow would be expected to flow overland across impermeable site surfaces (concrete pavements) towards the north in sympathy of the site topography. Landscaped areas located along the northern and eastern site boundaries would be expected to allow infiltration of effective rainfall and any surface runoff generated from up-gradient areas. Onsite stormwater drains are also expected to collect and intercept runoff to the local municipal stormwater infrastructure.

2.5.8 Sensitive Environments

Sensitive environments such as wetlands, ponds, creeks or extensive areas of natural vegetation were not identified on site or in the immediate surrounds. Elizabeth Bay is located approximately 170m to the east and cross-gradient of the site.

2.5.9 Landscaped Areas and Visible Signs of Plant Stress

Native and exotic vegetation including ground cover, shrubs and small trees approximately 1m to 3m in height were observed in the landscaped areas at the site. Based on a cursory inspection, visible stress or dieback were not observed from the onsite vegetation.

2.6 Surrounding Land Use

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

- North – Macdonald Street, residential apartments and HMAS Kuttabul located further to the north;

- South – Residential apartments with ground floor retail businesses including a hotel (Holiday Lodge), bar/restaurant (Yellow) and two dry cleaners (Challis Avenue Laundry & Dry Cleaning and Macleay Street Laundrette) located further to the south;
- East – Macleay Street, residential apartments and Elizabeth Bay located further to the east; and
- West – Macdonald Lane, residential apartments and Sydney Cove located further to the west.

JKE are of the opinion that the adjacent dry cleaners located to the south of the site is a potential off-site contamination source as the closest dry cleaner (Challis Avenue Laundry & Dry Cleaning) is located approximately 60m of the site boundary and is up-gradient (shown on Figure 2).

2.7 Underground Services

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

2.8 Review of section 10.7 Planning Certificate

The section 10.7 (2 and 5) planning certificates were reviewed for the PSI. A summary of the relevant information is outlined below:

- The land is not deemed to be: significantly contaminated; subject to a management order; subject of an approved voluntary management proposal; or subject to an on-going management order under the provisions of the CLM Act 1997;
- Council has not identified that a Site Audit Statement (SAS) has been received in respect to the land;
- The land is not located within a Class 1 or Class 2 acid sulfate soil (ASS) risk area;
- The land has not been identified as land that is within an environmentally sensitive area, buffer area or an ecologically sensitive area;
- The land has not been certified as biodiversity certified land under the Biodiversity Conservation Act 2016;
- The land has not been identified as being listed on the loose-fill asbestos insulation register;
- The land has been identified as located within a heritage conservation area under the Sydney Local Environmental Plan (LEP) 2012; and
- The land does not comprise a heritage item or draft heritage item listed on the State Heritage Register under the Heritage Act 1977.

2.9 Summary of Site History

Review of the site history information presented in the PSI report indicated the following:

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

Year(s)	On-site - Potential Land Use / Activities	Off-site - Potential Land Use / Activities
1930-1961	Site was occupied by a number of terraces. Site use was likely residential, possibly including commercial land use.	Predominantly residential including some commercial landuse.

Year(s)	On-site - Potential Land Use / Activities	Off-site - Potential Land Use / Activities
		Circa 1942 – Land reclamation had commenced within an area located to the north-east of the site.
1961-1965	Redevelopment of the site occurred which included the demolition of onsite buildings followed by the construction of a multi-storey building. The majority of the open areas of the site appeared to have been surfaced by pavement.	Additional multi-storey buildings had been constructed within the site surrounds. Commercial landuse had increased.
1965-present	High-rise residential and hotel use.	Residential and commercial landuse.

2.10 Summary of Regional Geology and Hydrogeology

2.10.1 Regional Geology

Review of regional geological information undertaken for the PSI indicates that the site is underlain by Hawkesbury Sandstone, which typically consists of medium to coarse grained quartz sandstone with minor shale and laminite lenses.

2.10.2 Acid Sulfate Soil (ASS) Risk and Planning

Review of ASS information undertaken for the PSI indicates that the site is located within a Class 5 ASS risk area. Works in a Class 5 risk area that could pose an environmental risk in terms of ASS include works within 500m of adjacent Class 1,2,3,4 land which are likely to lower the water table below 1m AHD on the adjacent Class 1,2,3,4 land. ASS Class 1 and 2 areas are located within 500m to the north, west and east of the site.

2.10.3 Hydrogeology

Hydrogeological information was reviewed for the PSI. The report indicates that the regional aquifer on-site and in the areas immediately surrounding the site includes porous, extensive aquifers of low to moderate productivity. There was a total of 64 registered bores within the report buffer of 2,000m. In summary:

- The nearest registered bore was located approximately 170m to the east of the site. This was utilised for domestic purposes;
- The majority of the bores were registered for monitoring and domestic purposes;
- There were no nearby bores (i.e. within 500m) registered for recreational or irrigation uses; and
- The drillers log information from the closest registered bores typically identified fill soil to depths of 0.5-1.5m, underlain by sandstone bedrock and deep sands. Standing water level (SWL) in the bores ranged from approximately 0.1mBGL to 1mBGL.

The information reviewed for the PSI indicates that the subsurface conditions at the site are likely to consist of relatively low permeability (residual) soils. The potential for viable groundwater abstraction and use of groundwater under these conditions is considered to be relatively low. There is a reticulated water supply in the area and consumption of groundwater is not expected to occur. Use of groundwater is not proposed as part of the development.

2.11 Receiving Water Bodies

Surface water bodies were not identified in the immediate vicinity of the site. The closest surface water body is Elizabeth Bay located approximately 170m to the east of the site. This is down-gradient from site and considered to be a potential receptor.

3 CONCEPTUAL SITE MODEL

NEPM (2013) defines a CSM as a representation of site related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. The CSM for the site is presented in the following sub-sections and is based on the site information (including the site inspection information) and the review of site history information. Reference should also be made to the figures attached in the appendices.

3.1 Potential Contamination Sources/AEC and CoPC

The potential contamination sources/AEC and CoPC identified during the PSI are presented in the following table:

Table 3-1: Potential (and/or known) Contamination Sources/AEC and Contaminants of Potential Concern

Source / AEC	CoPC
Fill material – The site appears to have been historically filled to achieve the existing levels. The fill may have been imported from various sources and could be contaminated. During the JKE inspection, the site levels were observed to be generally elevated from Macdonald Street and MacDonald Lane by approximately 0.5m.	Heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), petroleum hydrocarbons (referred to as total recoverable hydrocarbons – TRHs), benzene, toluene, ethylbenzene and xylene (BTEX), polycyclic aromatic hydrocarbons (PAHs), organochlorine pesticides (OCPs), organophosphate pesticides (OPPs), polychlorinated biphenyls (PCBs) and asbestos.
Use of pesticides – Pesticides may have been used beneath the buildings and/or around the site.	Heavy metals and OCPs
Hazardous Building Material – Hazardous building materials may be present as a result of former building and demolition activities. These materials may also be present in the existing buildings/ structures on site. Redevelopment of the site including building demolition had occurred between 1961 and 1965.	Asbestos, lead and PCBs
Off-site area 1 – Current dry cleaner businesses were identified within 100m of the site. The closest dry cleaner was located approximately 60m to the south and up-gradient of the site and may be a potential source of site contamination.	TRHs and VOCs, including tetrachloroethene (also known as perchloroethylene - PCE) and the breakdown products trichloroethene (TCE), cis-1,2-dichloroethene (cis-DCE) and vinyl chloride (VC).
Off-site area 2 – Several dry cleaner businesses were registered within 500m of the site between 1948 and 1993. At least two former dry cleaner properties were considered potential off-site sources of contamination due to their proximity and/or up-gradient locations from the site.	As above.

Based on the site inspection and historical assessment, JKE are of the opinion that there is a low potential for the site to have been used for activities associated with point sources of Per- and Polyfluoroalkyl Substances

(PFAS) (as outlined in Appendix B of the PFAS National Environmental Management Plan 2020)[7]. Though it is noted that PFAS can be associated with dry cleaning practices due to water proofing on clothing etc and therefore PFAS will be included in the DSI for screening purposes.

3.2 Mechanism for Contamination, Affected Media, Receptors and Exposure Pathways

The mechanisms for contamination, affected media, receptors and exposure pathways relevant to the potential contamination sources/AEC are outlined in the following CSM table:

Table 3-2: CSM

Potential mechanism for contamination	The potential mechanisms for contamination are most likely to include 'top-down' impacts and spills. There is a potential for sub-surface releases to have occurred if deep fill (or other buried industrial infrastructure) is present, although this is considered to be the least likely mechanism for contamination. The mechanisms for contamination from off-site sources could have occurred via 'top down' impacts and spills, or sub-surface release. Impacts to the site could occur via the migration of contaminated groundwater.
Affected media	Soil, soil vapour and groundwater have been identified as potentially affected media for the DSI.
Receptor identification	Human receptors include site occupants/users (including adults and children), construction workers and intrusive maintenance workers. Off-site human receptors include adjacent land users, groundwater users and recreational water users within Elizabeth Bay. Ecological receptors include terrestrial organisms and plants within unpaved areas (including the proposed landscaped areas), and marine ecology in Elizabeth Bay.
Potential exposure pathways	Potential exposure pathways relevant to the human receptors include ingestion, dermal absorption and inhalation of dust (all contaminants) and vapours (volatile TRH, naphthalene, VOCs and BTEX). The potential for exposure would typically be associated with the construction and excavation works, and future use of the site. Potential exposure pathways for ecological receptors include primary contact and ingestion. Exposure during future site use could occur via direct contact with soil in unpaved areas such as gardens, inhalation of airborne asbestos fibres during soil disturbance, or inhalation of vapours within enclosed spaces such as buildings and basements. Exposure to groundwater contamination is unlikely to occur in the Elizabeth Bay through direct migration as there would be some level of dilution as the water travels 170m to the bay. However, groundwater has the potential to enter the bay via the stormwater system (which is expected to discharge into the bay) in a drained basement scenario.
Potential exposure mechanisms	The following have been identified as potential exposure mechanisms for site contamination: • Vapour intrusion into the proposed basement and/or building (either from soil contamination or volatilisation of contaminants from groundwater);

[7] Heads of EPA Australia and New Zealand, (2020). *PFAS National Environmental Management Plan Version 2.0* (referred to as PFAS NEMP)

	• Contact (dermal, ingestion or inhalation) with exposed soils in landscaped areas and/or unpaved areas; • Contact with groundwater during construction, or possibly in the proposed basement in a drained basement scenario; • Migration of groundwater off-site and into nearby water bodies, including aquatic ecosystems and those being used for recreation; and • Migration of groundwater off-site into areas where groundwater is being utilised as a resource (i.e. for irrigation).
Presence of preferential pathways for contaminant movement	Local underground services such as stormwater and sewers have the potential to act as preferential pathway for contaminant migration at the site.

3.3 Assessment of PSI Data Gaps

JKE has undertaken a preliminary data gap analysis based on the findings of the PSI. The data gaps and comments are outlined in the following table:

Table 3-3: Data Gap Assessment

Data Gap	JKE Comments
Sampling/analysis of media	Sampling and analysis of media identified in the CSM was not undertaken for the PSI. Recommendations to address this data gap have been included in the PSI report. The PSI also recommended undertaking an ASS assessment as part of the DSI. The SAQP for the DSI has been designed to address this data gap.
Council Records	The review of council records was limited to planning-related information within the section 10.7 certificates and/or within the Local Environmental Plan (as outlined in the Lotsearch report). JKE is of the opinion that further review of council records such as building approval and development application records is unlikely to identify any information that would alter the outcome of the assessment at this stage.
SafeWork NSW Records	A search of SafeWork NSW records for licenses to store dangerous goods at the site could not be competed for the PSI due to client/site owner permission constraints. JKE will complete this search as part of the DSI scope.

4 SAMPLING, ANALYSIS AND QUALITY PLAN

4.1 Data Quality Objectives (DQO)

Data Quality Objectives (DQOs) have been developed to define the type and quality of data required to achieve the project objectives outlined in Section 1.2. The DQOs were prepared with reference to the process outlined in Schedule B2 of NEPM (2013). The seven-step DQO approach for this project is outlined in the following sub-sections.

The DQO process is validated in part by the Data Quality Assurance/Quality Control (QA/QC) Evaluation. The Data (QA/QC) Evaluation will be summarised in the DSI report.

4.1.1 Step 1 - State the Problem

The CSM identified potential sources of contamination/AEC at the site that may pose a risk to human health and the environment. Investigation data is required to assess the contamination status of the site, assess the risks posed by the contaminants in the context of the proposed development/intended land use, and assess whether remediation is required. This information will be considered by the consent authority in exercising its planning functions in relation to the development proposal.

A waste classification is required prior to off-site disposal of excavated soil/bedrock associated with the proposed development. An ASS assessment is required to assess the need for an ASSMP for the proposed development.

4.1.2 Step 2 - Identify the Decisions of the Study

The objectives of the DSI are outlined in Section 1.2. The decisions to be made reflect these objectives and are as follows:

- Did the site inspection, or does the historical information identify potential contamination sources/AEC at the site?
- Are any results above the SAC?
- Do potential risks associated with contamination exist, and if so, what are they?
- Is remediation required?
- Is the site characterisation sufficient to provide adequate confidence in the above decisions?
- Is the site suitable for the proposed development, or can the site be made suitable subject to further characterisation and/or remediation?
- Is there potential for disturbing ASS during the proposed development?
- Is an ASSMP required for the proposed development?
- What is the preliminary waste classification(s) for the waste soil/bedrock based on the DSI findings?

4.1.3 Step 3 - Identify Information Inputs

The primary information inputs required to address the decisions outlined in Step 2 include the following:

- Existing relevant environmental data from previous reports;
- Existing site information from the PSI, including site observations and site history documentation;
- Site information, including site observations and site history documentation;

- Sampling of potentially affected media, including soil, soil vapour and groundwater;
- Sampling of soil media for ASS analysis;
- Observations of sub-surface variables such as soil type, photo-ionisation detector (PID) concentrations, odours and staining, and groundwater physiochemical parameters;
- Laboratory analysis of soils, fibre cement (if encountered), soil vapour and groundwater samples for the CoPC identified in the CSM; and
- Field and laboratory QA/QC data.

4.1.4 Step 4 - Define the Study Boundary

The sampling will be confined to the site boundaries as shown in Figures 2 and 3 and will be limited vertically to a maximum nominated investigation depth of approximately 15mBGL (spatial boundary). The final depth could depend on site conditions and will be noted in the DSI. At this stage, the sampling is scheduled to be completed in July and August 2023 (temporal boundary). Areas not accessible for sampling will be noted in the DSI as data gaps.

4.1.5 Step 5 - Develop an Analytical Approach (or Decision Rule)

4.1.5.1 Tier 1 Screening Criteria

The laboratory data will be assessed against relevant Tier 1 screening criteria (referred to as SAC), as outlined in Section 5. Exceedances of the SAC do not necessarily indicate a requirement for remediation or a risk to human health and/or the environment. Exceedances are considered in the context of the CSM and valid SPR-linkages.

Where appropriate, data will be assessed against valid statistical parameters to characterise the data population. This may include calculation and application of mean values and/or 95% upper confidence limit (UCL) values for the data set, with regards to the NEPM (2013) framework and other relevant guidelines made under the CLM Act 1997. UCLs are considered acceptable where the UCL is below the SAC, the standard deviation of the data is less than 50% of the SAC and none of the individual concentrations are more than 250% of the SAC.

For the DSI, the following decision rules will be considered:

- If all CoPC (with the exception of asbestos) concentrations are below the SAC, then the data will be compared directly to the SAC without statistical analysis;
- For soil data, if any individual CoPC (with the exception of asbestos) concentration is above the SAC, then statistical analysis will be considered based on the sampling plan. This will include calculation of the 95% upper confidence limit (UCL) value for the data set, with regards to the NEPM (2013) framework and other relevant guidelines made under the CLM Act 1997. The UCL will be considered acceptable where the UCL is below the SAC, the standard deviation of the data is less than 50% of the SAC and none of the individual concentrations are more than 250% of the SAC;
- If asbestos concentrations are encountered above the SAC or in the top 100mm of soil, then asbestos will be deemed a contaminant of concern for remediation purposes; and
- Groundwater and soil vapour data will be compared directly to the SAC and evaluated with regards to valid/complete SPR-linkages.

4.1.5.2 Field and Laboratory QA/QC

Field QA/QC for soil and groundwater sampling will include analysis of inter-laboratory duplicates (minimum of 5% of primary samples), intra-laboratory duplicates (minimum of 5% of primary samples), and trip spike (for volatiles), trip blank (for selected organic and inorganic compounds) and rinsate (for selected organic and inorganic compounds) samples (one for each medium sampled to assess the adequacy of field practices).

Field QA/QC for soil vapour sampling will include analysis of intra-laboratory duplicate (minimum of 5% of primary samples) and shroud leak test sample.

Further details regarding the sampling and analysis undertaken, and the acceptable limits adopted, will be included in the Data Quality (QA/QC) Evaluation presented in the DSI report.

The suitability of the laboratory data is assessed against the laboratory QA/QC criteria which will be outlined in the laboratory reports. These criteria are developed and implemented in accordance with the laboratory's National Association of Testing Authorities, Australia (NATA) accreditation and align with the acceptable limits for QA/QC samples as outlined in NEPM (2013) and other relevant guidelines.

In the event that acceptable limits are not met by the laboratory analysis, other lines of evidence are reviewed (e.g. field observations of samples, preservation, handling etc) and, where required, consultation with the laboratory is undertaken in an effort to establish the cause of the non-conformance. Where uncertainty exists, the most conservative concentration reported are to be adopted.

4.1.5.3 Appropriateness of Practical Quantitation Limits (PQLs)

The PQLs of the analytical methods are to be considered in relation to the SAC to confirm that the PQLs are less than the SAC. In cases where the PQLs are greater than the SAC, a discussion of this is provided.

4.1.6 Step 6 – Specify Limits on Decision Errors

To limit the potential for decision errors, a range of quality assurance processes are adopted. A quantitative assessment of the potential for false positives and false negatives in the analytical results will be undertaken with reference to Schedule B(3) of NEPM (2013) using the data quality assurance information collected.

Decision errors can be controlled through the use of hypothesis testing. The test can be used to show either that the baseline condition is false or that there is insufficient evidence to indicate that the baseline condition is false. The null hypothesis is an assumption that is assumed to be true in the absence of contrary evidence. For this investigation, the null hypothesis (H_0) is that the 95% UCL for the CoPC is greater than the SAC. The alternative hypothesis (H_A) is that the 95% UCL for the CoPC is less than the SAC. Alternative considerations are made regarding asbestos based on an assessment of multiple lines of evidence.

Potential outcomes include Type I and Type II errors as follows:

- Type I error of determining that the soil is acceptable for the proposed land use when it is not (wrongly rejects true H_0), includes an alpha (α) risk of 0.05; and

- Type II error of determining that the soil is unacceptable for the proposed land use when it is (wrongly accepts false H_0), includes beta (β) risk of 0.2.

Where statistical analysis is applied in accordance with Step 5 via the calculation of UCL values, the potential for decision errors to occur will also be evaluated using the Combined Risk Value (CRV) method as outlined in Appendix E of the NSW EPA Sampling Design Part 1 – Application (2022)[8] contaminated land guidelines. The CRV method will be used retrospectively to establish whether there is sufficient statistical power in the UCL.

Statistical analysis will not apply to soil vapour, asbestos or groundwater data, therefore these data will be assessed based on a multiple lines of evidence and risk-based approach.

Data Quality Indicators (DQI) for field and laboratory QA/QC samples are defined below. An assessment of the DQI's is to be made in relation to precision, accuracy, representativeness, completeness and comparability.

Field Duplicates

Acceptable targets for precision of field duplicates will be 30% or less, consistent with NEPM (2013). RPD failures will be considered qualitatively on a case-by-case basis taking into account factors such as the concentrations used to calculate the RPD (i.e. RPD exceedance where concentrations are close to the PQL are typically not as significant as those where concentrations are reported at least five or 10 times the PQL), sample type, collection methods and the specific analyte where the RPD exceedance was reported.

Trip Blanks and Rinsates

Acceptable targets for field blank and rinsate samples in this report will be less than the PQL for organic analytes. Metals will be considered on a case-by-case basis with regards to typical background concentrations in soils and published drinking water guidelines for waters.

Trip Spikes

Acceptable targets for trip spike samples will be 70% to 130%.

Isopropanol Shroud

The isopropanol shroud sample is used for leak test purposes. The shroud sample intends to demonstrate a high isopropanol concentration within the shroud sample, then the soil vapour samples ideally should not detect significant concentrations of isopropanol. A significant (>10mg/m^3) detection of isopropanol in the soil vapour samples may indicate a leak in the installation of the vapour pin and suggest that ambient air is being drawn into the installation during sampling.

Laboratory QA/QC

The suitability of the laboratory data will be assessed against the laboratory QA/QC criteria. These criteria are developed and implemented in accordance with the laboratory's NATA accreditation and align with the acceptable limits for QA/QC samples as outlined in NEPM (2013) and other relevant guidelines.

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

A summary of the typical limits is provided below:

RPDs

- Results that are <5 times the PQL, any RPD is acceptable; and
- Results >5 times the PQL, RPDs between 0-50% are acceptable.

Laboratory Control Samples (LCS) and Matrix Spikes

- 70-130% recovery acceptable for metals and inorganics; and
- 60-140% recovery acceptable for organics.

Surrogate Spikes

- 60-140% recovery acceptable for general organics.

Method Blanks

- All results less than PQL.

In the event that acceptable limits are not met by the laboratory analysis, other lines of evidence will be reviewed (e.g. field observations of samples, preservation, handling etc) and, where required, consultation with the laboratory is to be undertaken in an effort to establish the cause of the non-conformance. Where uncertainty exists, we will adopt the most conservative concentration reported.

4.1.7 Step 7 - Optimise the Design for Obtaining Data

The most resource-effective design will be used in an optimum manner to achieve the investigation objectives. Adjustment of the investigation design can occur following consultation or feedback from project stakeholders. For the DSI, the design will be optimised via consideration of the various lines of evidence used to select the sample locations, the media being sampled, and also by the way in which the data will be collected. The sampling plan and methodology are outlined in the following sub-sections.

4.2 Soil Sampling Plan and Methodology

The soil sampling plan and methodology proposed for the DSI is outlined in the table below:

Table 4-1: Proposed DSI Soil Sampling Plan and Methodology

Aspect	Input
Sampling Density	Samples for the DSI will be collected from eight (8) locations as shown on the attached Figure 3. This number of locations meets the minimum sampling density for hotspot identification, as outlined in the NSW EPA Sampling Design Part 1 – Application (2022)[9] contaminated land guidelines. Based on the above density, and the square grid spacing of 15m will be adopted for the DSI as shown on Figure 3. The sampling density for asbestos in soil will be limited to the eight (8) locations. JKE are of the opinion that the density is adequate at this stage of the investigation as existing site information indicating the presence of fill impacted by building rubble and/or asbestos has not been identified.

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

Aspect	Input
	Sampling for ASS screening will be limited to four selected boreholes. Three of the deeper boreholes drilled for the JKG geotechnical investigation will be utilised for sampling.
Sampling Plan	The sampling locations will be placed on a systematic plan with a grid spacing of approximately 15m between sampling location. A systematic plan is considered suitable to identify hotspots to a 95% confidence level and calculate UCLs for specific data populations (UCLs were only applied were appropriate and in accordance with the DQOs).
Set-out and Sampling Equipment	Sampling locations will be set out using a tape measure. In-situ sampling locations will be checked for underground services by an external contractor prior to sampling. Samples will be collected using a combination of hand equipment and drill rig equipped with spiral flight augers (150mm diameter). Soil samples will be obtained from a Standard Penetration Test (SPT) split-spoon sampler, and/or directly from the auger.
Sample Collection and Field QA/QC	Soil samples will be obtained in accordance with our standard field procedures. Soil samples will be collected from the fill and natural profiles based on field observations. Where the subsurface conditions permit, a sample is typically attempted to be obtained from each distinct fill/soil profile. The sample depths will be shown on the logs included in the DSI report. Soil samples for contamination testing (except for PFAS analysis) will be placed in glass jars with plastic caps and Teflon seals with minimal headspace. Samples for PFAS analysis will be placed in laboratory provided plastic jars with plastic caps (no Teflon). Samples for asbestos analysis will placed in zip-lock plastic bags. Samples for ASS screening will be placed in plastic bags and sealed with plastic ties with minimal headspace. JKE will undertake a pre-fieldwork check procedure in relation to PFAS sampling to confirm that potential sources of cross-contamination are reviewed and eliminated. This check list will be included in the DSI report as fieldwork documentation. During sampling, soil at selected depths will be split into primary and duplicate samples for field QA/QC analysis. The field splitting procedure includes alternate filling of the sampling containers to obtain a representative split sample. Homogenisation of duplicate samples will not occur to minimise the potential for the release of volatile organic compounds.
Field Screening	A portable Photoionisation Detector (PID) fitted with a 10.6mV lamp will be used to screen the samples for the presence of volatile organic compounds (VOCs). PID screening for VOCs will be undertaken on soil samples using the soil sample headspace method. VOC data will be obtained from partly filled zip-lock plastic bags following equilibration of the headspace gases. PID calibration records will be maintained for the project. The field screening for asbestos quantification will include the following: • A representative bulk sample (approximately 10L sample, to the extent achievable based on sample return) is to be collected from fill at 1m intervals, or from each distinct fill profile. The quantity of material for each sample may vary based on the return achieved using the auger. The bulk sample intervals will be shown on the borehole logs; • Each sample will be weighed using an electronic scale;

Aspect	Input
	• Each bulk sample will be passed through a sieve with a 7.1mm aperture and inspected for the presence of fibre cement. If the soil is cohesive in nature, the samples will be subsequently placed on a contrasting support (blue tarpaulin) and inspected for the presence of fibre cement. Any soil clumps/nodules will be disaggregated; • The condition of fibre cement or any other suspected asbestos materials will be noted on the field records; and • If observed, any fragments of fibre cement in the bulk sample will be collected, placed in a zip-lock bag and assigned a unique identifier. Calculations for asbestos content will be undertaken based on the requirements outlined in Schedule B1 of NEPM (2013), as summarised in Section 5.1. A calibration/check of the accuracy of the scale used for weighing the fibre cement fragments will be undertaken using a set of calibration weights. Calibration/check records are maintained on file by JKE. The scale used to weigh the 10L samples will not be calibrated, however this is not considered significant as this method of providing a weight for the bulk sample is considered to be considerably more accurate than applying a nominal soil density conversion.
Decontamination and Sample Preservation	Sampling personnel will use disposable nitrile gloves during sampling activities. Re-usable sampling equipment will be decontaminated using potable water (with rags and scrubbing brush), followed by a rinse with potable water. Detergents (such as Decon 90) will not be utilised during the decontamination process as they may result in interference during PFAS analysis. Soil samples will be preserved by immediate storage in an insulated sample container with ice. Samples for ASS screening will be frozen upon return to the JKE office. On completion of the fieldwork, the samples may be stored temporarily in fridges in the JKE warehouse before being delivered in the insulated sample container to a NATA registered laboratory for analysis under standard chain of custody (COC) procedures.

4.3 Groundwater Sampling Plan and Methodology

The groundwater sampling plan and methodology proposed for the DSI is outlined in the table below:

Table 4-2: Proposed Groundwater Sampling Plan and Methodology

Aspect	Input
Sampling Plan	Groundwater monitoring wells will be installed in three (3) selected boreholes drilled for the JKG geotechnical investigation. The wells will be positioned to establish background groundwater conditions at the site and will be placed along the east and west site boundaries. The wells along the south site boundary will be designed to assess the groundwater moving onto the site from south. The location of the wells will depend on access constrains during the investigation. However, the wells will be place to address off-site migration of potentially contaminated groundwater, gain site coverage and determine the groundwater flow direction.
Monitoring Well Installation Procedure	The monitoring well construction details will be documented on the appropriate borehole logs. The monitoring wells will be installed to depths of approximately 9m to 15mBGL.

Aspect	Input
	The wells will generally be constructed as follows: • 50mm diameter Class 18 PVC (machine slotted screen) installed in the lower section of the well to intersect groundwater; • 50mm diameter Class 18 PVC casing installed in the upper section of the well (screw fixed); • A 2mm sand filter pack used around the screen section for groundwater infiltration; • A hydrated bentonite seal/plug used on top of the sand pack to seal the well; and • A gatic cover installed at the surface with a concrete plug to limit the inflow of surface water. The monitoring well installation, including the screen lengths, is considered suitable for assessment of general groundwater quality with regards to Table 5 in Schedule B2 of NEPM 2013.
Monitoring Well Development	The monitoring wells will be developed after installation using a submersible electrical pump/dedicated disposable plastic bailer. During development, the following parameters will be monitored using calibrated field instruments: • Standing water level (SWL) using an electronic dip meter; and • pH, temperature, electrical conductivity (EC), dissolved oxygen (DO) and redox potential (Eh) using a YSI Multi-probe water quality meter. Steady state conditions are considered to have been achieved when the difference in the pH measurements is less than 0.2 units, the difference in conductivity is less than 10%, and when the SWL is not in drawdown. In the event that groundwater in-flow is relatively slow, the development will continue until the wells are effectively dry. The field monitoring records and calibration data will be included in the DSI report.
Groundwater Sampling	The monitoring wells will be allowed to recharge for approximately three to five days after development. Prior to sampling, the monitoring wells were checked for the presence of Light and Deep Non-Aqueous Phase Liquids (LNAPL/DNAPL) using an inter-phase probe electronic dip meter. The monitoring well head space will be checked for VOCs using a calibrated PID unit. The samples will be obtained using a peristaltic pump. During sampling, the following parameters will be monitored using calibrated field instruments: • SWL using an electronic dip meter; and • pH, temperature, EC, DO and Eh using a YSI Multi-probe water quality meter. Groundwater samples will be obtained directly from the single use PVC tubing and placed in the sample containers. Duplicate samples are to be obtained by alternate filling of sample containers. This technique is adopted to minimise disturbance of the samples and loss of volatile contaminants associated with mixing of liquids in secondary containers, etc. Groundwater removed from the wells during development and sampling will be transported to JKE in jerry cans and stored in holding drums prior to collection by a licensed waste water contractor for off-site disposal. The field monitoring record and calibration data will be included in the DSI report.
Decontaminant and Sample Preservation	The pump and inter-phase probe electronic dip meter will be decontaminated between monitoring wells using potable water (with rags and scrubbing brush), followed by a rinse with potable water. Detergents (such as Decon 90) will not be utilised during the decontamination process as they may result in interference during PFAS analysis. The groundwater sampling

Aspect	Input
	process utilises a peristaltic pump and single-use tubing, therefore no decontamination procedure for the sampling is considered necessary. Rinsate samples are to be obtained during the decontamination process as part of the field QA/QC. The samples will be preserved with reference to the analytical requirements and placed in an insulated container with ice or ice bricks. On completion of the fieldwork, the samples will be temporarily stored in a fridge at the JKE office, before being delivered in the insulated sample container to a NATA registered laboratory for analysis under standard COC procedures.

4.4 Soil Vapour Sampling Plan and Methodology

The soil vapour sampling plan and methodology proposed for the DSI is outlined in the table below:

Table 4-3: Proposed Soil Vapour Sampling Plan and Methodology

Aspect	Input
Sampling Plan	Soil vapour samples will be collected from sub-slab vapour pins at five locations. The sampling locations will be placed in the south and central sections of the site down and cross gradient to the off-site dry-cleaner identified as an AEC in the CSM. The sampling plan has been designed as a preliminary screening to assess potential risks associated with migration of VOCs associated with the off-site dry-cleaner. The screening will be limited to the sub-slab and upper surface of the fill profile. The scope does not include screening of soil vapour conditions at the depth of the proposed basement. A multiple line of evidence approach will be adopted for the Tier 1 risk assessment incorporating the soil vapour results, groundwater flow and groundwater results.
Set-out and Sampling Equipment	The sampling locations will be set out using a tape measure. Samples will be collected using summa canisters using the TO-15 sampling method from sub-slab vapour pins.
Vapour pin Installation	Soil vapour pins will be installed by JKE in the sub-slab zone directly beneath the base of the concrete slab. A 16mm diameter hammer hole will be advanced through the slab and sealed with a temporary vapour pin. A copy of the Standard Operating Procedure (SOP) for Installation and Extraction of the Vapour Pin is attached. Prior to sampling, the sub-slab soil gas conditions will be allowed to re-equilibrate for at least 60 minutes before soil vapour sampling.
Soil vapour Sampling (USEPA TO-15)	Soil vapour sampling will utilise single-use tubing and other sampling apparatus (e.g, soil vapour pins, canisters, flow restrictors), therefore no decontamination procedures are considered necessary. The NATA registered laboratory will supply JKE with the sampling apparatus which will include a "*Certificate of Cleanliness*" confirming that the summa canisters are clean. It is anticipated that 1L canisters will be utilised, with flow restrictors on the sampling trains that restrict flow to 100mL/minute. This flow rate is considered acceptable given that the sub-slab is not likely to include a tight formation. The following procedures are to be implemented for soil vapor sampling: • Leak detection will be undertaken by placing a cloth soaked in isopropyl alcohol (IPA) into the shroud. At the soil vapour sampling location, a laboratory supplied syringe will be

Aspect	Input
	used to draw air from within the shroud through a thermal desorption carbon tube which will be analysed for IPA; • A shut in/leak test will be undertaken to test the integrity of the vacuum on the sample train. Once the shut-in/leak test is passed, this will be recorded on the COC documents; • Approximately 300mL of air is to be purged through the sample collection pathway using laboratory supplied syringe. The purged volume is to be recorded on the COC; • Once the above has been completed, the following procedure is implemented for soil vapour sampling: ➢ Connect the female connector to the Teflon tubing extending from the soil vapour pin to the sampling train (note: these will already be connected from the purging stage) and then to the canister; ➢ Open the valve on the canister and the sample will begin to collect in the canister. The vacuum gauge on the canister will be checked to ensure that a vacuum of approximately -26 to -30" Hg is present within the canister. The initial vacuum level and initial sampling time will be recorded on the COC; ➢ Sampling should continue until a vacuum level of approximately -5 to -4" Hg is present within the canister, with sampling stopped by closing the valve on the canister. The final vacuum level and final sampling time will be recorded on the COC; ➢ Disconnect the canister and the sample train. Following completion of soil vapour sampling the soil vapour pins are to be extracted as per the SOP; and • Duplicate sampling is to be undertaken by connecting a new female connector and new sampling train to the soil vapor pin Teflon tubing. As the sample collection pathway itself has already been purged, one pull of the laboratory supplied syringe will be required to purge approximately 100mL, which should be adequate to purge the new sampling train. The sampling procedure above should be repeated to obtain the duplicate sample. On completion of the fieldwork, the soil vapour samples may be temporarily stored prior to delivery to a NATA registered laboratory for analysis under standard COC procedures and within recommended holding times.
Meteorological Data	Barometric pressure, wind speed and temperature will be recorded on the day of monitoring.

4.5 Laboratory Analysis and Proposed Analytical Schedule

Samples will analysed by an appropriate, NATA Accredited laboratory using the analytical methods detailed in Schedule B(3) of NEPM 2013. The laboratory details are provided in the table below:

Table 4-4: Laboratory Details

Samples	Laboratory
All primary samples and field QA/QC samples including intra-laboratory duplicates, trip blanks, trip spikes, field rinsate and shroud samples	Envirolab Services Pty Ltd NSW, NATA Accreditation Number – 2901 (ISO/IEC 17025 compliance)
Inter-laboratory duplicates	Envirolab Services Pty Ltd VIC, NATA Accreditation Number – 2901 (ISO/IEC 17025 compliance)

For the DSI, an allowance has been made for the following analysis:

- Up to eight selected fill/natural soil samples will be analysed for: heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc); PAHs; TRH; BTEX; OCPs and OPPs; PCBs; and asbestos (500ml);
- Up to eight selected fill/natural soil samples will be analysed for PFAS;
- Up to six selected deeper fill/natural soil samples will be analysed for: heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc); PAHs; TRH; BTEX;
- Up to two selected fill/natural soil samples will be analysed for: pH; cation exchange capacity (CEC); and clay content (%);
- Up to four selected fibre cement fragments, if found on or in soil, will be analysed for asbestos;
- Up to three groundwater samples will be analysed for the following: heavy metals; TRH/BTEX; low level PAHs; VOCs; trace level PFAS; pH; EC;
- Up to five soil vapour samples will be analysed for: VOCs (including BTEX and naphthalene) and TRH (F1 and F2);
- Up to 16 selected fill/natural samples will be analysed for ASS using the pH field test method (pH_F and pH_{FOX});
- Up to four selected fill/natural samples will be analysed for ASS using the Chromium Reducible Sulfur (S_{CR}) acid base accounting method; and
- Collection and analysis of QA/QC samples (including intra- and inter-laboratory duplicates, shroud, trip blank, trip spike and field rinsate samples).

The soil analysis will generally target the fill soils and the first contact of natural soils. Deeper samples may be analysed based on the results of the shallow soils and site observations. A staged approach to soil sample analysis has been undertaken to allow for targeting areas based on the results of the initial analysis round.

We note that the analytical method for TO-15 will only enable analysis of TRH F2 in the C_{10}-C_{12} fractions and does not cover >C_{12}-C_{16}. However, for the purposes of the vapour screening this method is considered more accurate and reliable than the TO-17.

5 SITE ASSESSMENT CRITERIA (SAC)

The following SAC derived from the NEPM 2013 and other guidelines as discussed in the following sub-sections will be adopted for the DSI.

5.1 Soil

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

5.1.1 Human Health

- Health Investigation Levels (HILs) for a 'residential with minimal opportunity for soil access' exposure scenario (HIL-B);
- Health Screening Levels (HSLs) for a 'low-high density residential' exposure scenario (HSL-A & HSL-B). HSLs will be calculated based on conservative assumptions including a 'sand' type and a depth interval of 0m to 1m;
- HIL-B criteria will be adopted for PFAS assessment based on Table 2 in The PFAS National Environmental Management Plan (NEMP) Version 2.0 2020[10];
- HSLs for direct contact presented in the CRC Care Technical Report No. 10 – Health screening levels for hydrocarbons in soil and groundwater Part 1: Technical development document (2011)[11]; and
- Asbestos will be assessed against the HSL-B criteria. A summary of the asbestos criteria is provided in the table below:

Table 5-1: Details for Asbestos SAC

Guideline	Applicability
Asbestos in Soil	The HSL-B criteria will be adopted for the assessment of asbestos in soil. The SAC adopted for asbestos are derived from the NEPM 2013 and based on the Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2021)[12]. The SAC include the following: • No visible asbestos at the surface/in the top 10cm of soil; • <0.04% w/w bonded asbestos containing material (ACM) in soil; and • <0.001% w/w asbestos fines/fibrous asbestos (AF/FA) in soil. Concentrations for bonded ACM concentrations in soil are based on the following equation which is presented in Schedule B1 of NEPM (2013): $\textbf{\% w/w asbestos in soil} = \dfrac{\textbf{\% asbestos content x bonded ACM (kg)}}{\text{Soil volume (L) x soil density (kg/L)}}$ However, we are of the opinion that the actual soil volume in a 10L bucket varies considerably due to the presence of voids, particularly when assessing cohesive soils. Therefore, each bucket sample was weighed using electronic scales and the above equation was adjusted as follows (we note that the units have also converted to grams):

[10] Heads of EPAs Australia and New Zealand (HEPA). PFAS National Environmental Management Plan Version 2.0 - January 2020 (referred to as NEMP 2020)

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

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

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

5.1.2 Environment (Ecological – terrestrial ecosystems)

- Ecological Investigation Levels (EILs) and Ecological Screening Levels (ESLs) for an 'urban residential and public open space' (URPOS) exposure scenario. The EILs will only be applied to the top 2m of soil as outlined in NEPM (2013). The criterion for benzo(a)pyrene will be increased from the value presented in NEPM (2013) based on the Canadian Soil Quality Guidelines[13];
- ESLs will be adopted based on the soil type;
- The ecological (direct exposure) guidelines for soil will be adopted for PFAS assessment based on Table 3 in NEMP 2020; and
- EILs for selected metals will be calculated using site specific soil parameters for pH, cation exchange capacity and clay content. The data used to select the added contaminant limit (ACL) values presented in Schedule B(1) of NEPM (2013), and published ambient background concentration (ABC) presented in the document titled Trace Element Concentrations in Soils from Rural and Urban Areas of Australia (1995)[14]. This method is considered to be adequate for the Tier 1 screening.

5.1.3 Management Limits for Petroleum Hydrocarbons

Management limits for petroleum hydrocarbons (as presented in Schedule B1 of NEPM 2013) will be applied.

5.1.4 Waste Classification

Data for the waste classification assessment will be assessed in accordance with the Waste Classification Guidelines, Part 1: Classifying Waste (2014)[15] as outlined in the following table:

Table 5-2: Waste Categories

Category	Description
General Solid Waste (non-putrescible)	• If Specific Contaminant Concentration (SCC) ≤ Contaminant Threshold (CT1) then Toxicity Characteristics Leaching Procedure (TCLP) not needed to classify the soil as general solid waste; and • If TCLP ≤ TCLP1 and SCC ≤ SCC1 then treat as general solid waste.
Restricted Solid Waste (non-putrescible)	• If SCC ≤ CT2 then TCLP not needed to classify the soil as restricted solid waste; and • If TCLP ≤ TCLP2 and SCC ≤ SCC2 then treat as restricted solid waste.
Hazardous Waste	• If SCC > CT2 then TCLP not needed to classify the soil as hazardous waste; and • If TCLP > TCLP2 and/or SCC > SCC2 then treat as hazardous waste.
Virgin Excavated Natural Material (VENM)	Natural material (such as clay, gravel, sand, soil or rock fines) that meet the following:

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

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

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

Category	Description
	• That has been excavated or quarried from areas that are not contaminated with manufactured chemicals, or with process residues, as a result of industrial, commercial mining or agricultural activities; • That does not contain sulfidic ores or other waste; and • Includes excavated natural material that meets such criteria for virgin excavated natural material as may be approved from time to time by a notice published in the NSW Government Gazette.

The PFAS data will be assessed against the NSW EPA Addendum to the Waste Classification Guidelines (2014) – Part 1: classifying waste[16].

5.1.5 Acid Sulfate Soil

The action criteria presented in the *National Acid Sulfate Soil Guidance: National acid sulfate soils sampling and identification methods manual* (2018) are summarised in the following table. The action criteria for 'coarse textured soils' will be adopted.

Table 5-3: ASS Action Criteria

Type of material		**Net Acidity**			
Texture range* (NCST 2009)	Approximate clay content (%)	1–1000 t materials disturbed		> 1000 t materials disturbed	
		% S-equiv. (oven-dried basis)	mol H^+/t (oven-dried basis)	% S-equiv. (oven-dried basis)	mol H^+/t (oven-dried basis)
Fine - light medium to heavy clays	>40	≥0.10	≥62	≥0.03	≥18
Medium - clayey sand to light clays	5–40	≥0.06	≥36	≥0.03	≥18
Coarse and Peats - sands to loamy sands	<5	≥0.03	≥18	≥0.03	≥18

* If bulk density values are not available for the conversion of cubic meters to tonnes of soil, then default bulk densities, based on the soil texture, may be used.

5.2 Groundwater

Groundwater data will be compared to relevant Tier 1 screening criteria in accordance with NEPM (2013), following an assessment of environmental values in accordance with the Guidelines for the Assessment and Management of Groundwater Contamination (2007)[17]. Environmental values for the DSI include aquatic ecosystems, human uses (incidental contact and recreational water use), and human-health risks in non-use scenarios (vapour intrusion).

[16] NSW EPA, (2016). *Addendum to the Waste Classification Guidelines (2014) – Part 1: classifying waste*

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

5.2.1 Human Health

- The NEPM (2013) HSLs are not applicable for this project as the proposed basement is anticipated to intersect groundwater. On this basis, JKE will undertake a site-specific assessment (SSA) for the Tier 1 screening of human health risks posed by volatile contaminants in groundwater. The assessment will include selection of alternative Tier 1 criteria that are considered suitably protective of human health. These criteria are based on drinking water guidelines and have been referred to as HSL-SSA. The criteria are based on the following:
  - Australian Drinking Water Guidelines 2011 (updated 2021)[18] for BTEX compounds and selected VOCs;
  - World Health Organisation (WHO) document titled Petroleum Products in Drinking-water, Background document for the development of WHO Guidelines for Drinking Water Quality (2008)[19] for petroleum hydrocarbons. We will conservatively adopt the value of 100µg/L for TRH F1 and F2;
  - USEPA Region 9 screening levels for naphthalene (threshold value for tap water); and
  - The use of the laboratory PQLs for other contaminants where there were no Australian guidelines.
- The ADWG 2011 will be multiplied by a factor of 10 to assess potential risks associated with incidental/recreational-type exposure to groundwater (e.g. within down-gradient water bodies or with seepage water in the basement). These will be deemed as 'recreational' SAC; and
- The recreational water quality guideline value will be adopted for PFAS assessment based on Table 1 in NEMP 2020.

The HSL-SSA will be utilised as screening criteria only and it is acknowledged that there are limitations in applying these. The potential for groundwater impacted by volatile contaminants to pose a risk will be evaluated using multiple lines of evidence, including the groundwater results, soil vapour results and the proposed basement design.

5.2.2 Environment (Ecological - aquatic ecosystems)

Groundwater Investigation Levels (GILs) for 95% protection of marine species will be adopted based on the Default Guideline Values in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2018)[20]. The 99% trigger values will be adopted where required to account for bioaccumulation. Low and moderate reliability trigger values will also be adopted for some contaminants where high-reliability trigger values don't exist.

The ecological (interim marine) water quality guidelines will be adopted for PFAS assessment based on NEMP 2020, based on 95% protection (slightly to moderately disturbed systems).

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

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

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

5.3 Soil Vapour

Soil vapour data will be assessed against the HSL-B and interim HIL-B concentrations presented in Schedule B1 of NEPM (2013). Conservatively, the HSLs will be derived using a 0-1m depth interval and a sand soil type. An alternative soil type (e.g. clay) may be used depending on the subsurface conditions encountered in the DSI sampling locations.

Where other VOCs are reported in soil vapour samples above the laboratory quantification limits, and if there are no SAC within the NEPM (2013), alternative SAC will be adopted using the USEPA vapour intrusion screening level calculator. These will be based on a residential exposure scenario, with a cancer target risk level of 10^{-5} and a hazard quotient of 1.

6 DSI REPORTING REQUIREMENTS

A DSI report is to be prepared presenting the results of the investigation, in accordance with the NSW EPA Consultants Reporting on Contaminated Land, Contaminated Land Guidelines (2020)[21].

A copy of this SAQP will be attached as an appendix in the DSI and the DSI will include a summary of SAQP/investigation section that will acknowledge compliance and/or any deviations to this plan.

[21] NSW EPA, (2020). *Consultants Reporting on Contaminated Land, Contaminated Land Guidelines*

7 LIMITATIONS

The report limitations are outlined below:

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

Important Information About This Report

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

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

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

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

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

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

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

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

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

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

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

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

Appendix A: Report Figures

AERIAL IMAGE SOURCE: MAPS.AU.NEARMAP.COM

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

Title: **SITE LOCATION PLAN**

Location: 45-53 MACLEAY STREET, POTTS POINT, NSW

Project No: E34303B

Figure No: 1

JKEnvironments

PLOT DATE: 10/09/2021 10:01:45 AM DWG FILE: Z:\5 EIS\5C EIS JOBS\34000'S\E34303B POTTS POINT\CAD\E34303B.DWG

LEGEND

APPROXIMATE SITE BOUNDARY

AERIAL IMAGE SOURCE: MAPS.AU.NEARMAP.COM

0 3 6 9 12 15

SCALE 1:300 @A3 METRES

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

Title:	**SITE FEATURES PLAN**
Location:	45-53 MACLEAY STREET, POTTS POINT, NSW
Project No:	E34303B
Figure No:	2

JKEnvironments

PLOT DATE: 10/09/2021 10:21:24 AM DWG FILE: Z:\5 EIS\5C EIS JOBS\34000'S\E34303B POTTS POINT\CAD\E34303B.DWG

LEGEND

APPROXIMATE SITE BOUNDARY

PROPOSED BOREHOLE LOCATION

AERIAL IMAGE SOURCE: MAPS.AU.NEARMAP.COM

0 3 6 9 12 15

SCALE 1:300 @A3 METRES

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

Title:	PROPOSED SAMPLE LOCATION PLAN
Location:	45-53 MACLEAY STREET, POTTS POINT, NSW
Project No:	E34303B
Figure No:	3

JKEnvironments

PLOT DATE: 1/06/2023 11:03:22 AM DWG FILE: K:\5C EIS JOBS\34000'S\E34303B POTTS POINT\CAD\E34303B.DWG

Groundwater Field Work Documents

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PID FIELD CALIBRATION FORM

Client:	Time & Place Development Pty Ltd
Project:	Proposed Residential Development
Location:	45-53 Macleay Street, POTTS POINT, NSW
Job Number:	E34303B

PID

Make: MiniRaeLite+	Model: PGM7350	Unit: PID2	Date of last factory calibration: 17/05/23
Date of calibration: 01/08/23		Name of Calibrator: AD	
Calibration gas: Iso-butylene		Calibration Gas Concentration:	100.0 ppm
Measured reading: 100.3 ppm		Error in measured reading: ±	ppm
Measured reading Acceptable (Yes/No): Yes			

PID

Make: MiniRaeLite+	Model: PGM7350	Unit: PID2	Date of last factory calibration: 17/05/23
Date of calibration: 02/08/23		Name of Calibrator: AD	
Calibration gas: Iso-butylene		Calibration Gas Concentration:	100.0 ppm
Measured reading: 100.6 ppm		Error in measured reading: ±	ppm
Measured reading Acceptable (Yes/No): Yes			

PID

Make: MiniRaeLite+	Model: PGM7350	Unit: PID2	Date of last factory calibration: 17/05/23
Date of calibration: 04/08/23		Name of Calibrator: AD	
Calibration gas: Iso-butylene		Calibration Gas Concentration:	100.0 ppm
Measured reading: 101.3 ppm		Error in measured reading: ±	ppm
Measured reading Acceptable (Yes/No): Yes			

PID

Make: MiniRaeLite+	Model: PGM	Unit: PID2	Date of last factory calibration: 17/05/23
Date of calibration: 10/08/23		Name of Calibrator: AD	
Calibration gas: Iso-butylene		Calibration Gas Concentration:	100.0 ppm
Measured reading: 99.8 ppm		Error in measured reading: ±	ppm
Measured reading Acceptable (Yes/No): Yes			

PID

Make:	Model:	Unit:	Date of last factory calibration:
Date of calibration:		Name of Calibrator:	
Calibration gas: Iso-butylene		Calibration Gas Concentration:	100.0 ppm
Measured reading: ppm		Error in measured reading: ±	ppm
Measured reading Acceptable (Yes/No):			

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WATER QUALITY METER CALIBRATION FORM

Client:	Time & Place Development Pty Ltd		
Project:	Proposed Residential Development		
Location:	45-53 Macleay Street, POTTS POINT, NSW		
Job Number:	E34303B		
DISSOLVED OXYGEN			
Make: YSI S		Model:	
Date of calibration: 04/08/23		Name of Calibrator: AD	
Span value: 70% to 130%			
Measured value: 99%			
Measured reading Acceptable (Yes/No): Yes			
pH			
Make: YSIS		Model:	
Date of calibration: 04/08/23		Name of Calibrator: AD	
Buffer 1: Theoretical pH = 7.01± 0.01		Expiry date: 05/24	Lot No: 398134
Buffer 2: Theoretical pH = 4.01± 0.01		Expiry date: 07/24	Lot No: CB2665
Measured reading of Buffer 1: 7.10			
Measured reading of Buffer 2: 4.02			
Slope:		Measured reading Acceptable (Yes/No): Yes	
EC			
Make: YSIS		Model:	
Date: 04/08/23	Name of Calibrator: AD		Temperature: 14.9 °C
Calibration solution: Conductivity standard		Expiry date: 04/24	Lot No: DL210423
Theoretical conductivity at temperature (see solution container): 1143 µS/cm			
Measured conductivity: 1142 µS/cm		Measured reading Acceptable (Yes/No): Yes	
REDOX			
Make: YSI		Model:	
Date of calibration: 04/08/23		Name of Calibrator: AD	
Calibration solution: ORPTest Solution		Expiry date: 09/27	Lot No: 8169
Theoretical redox value: 240mV			
Measured redox reading: 235.9 mV		Measured reading Acceptable (Yes/No): Yes	

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WATER QUALITY METER CALIBRATION FORM

<table>
<tr><td colspan="2">Client:</td><td colspan="3">Time & Place Development Pty Ltd</td></tr>
<tr><td colspan="2">Project:</td><td colspan="3">Proposed Residential Development</td></tr>
<tr><td colspan="2">Location:</td><td colspan="3">45-53 Macleay Street, POTTS POINT, NSW</td></tr>
<tr><td colspan="2">Job Number:</td><td colspan="3">E34303B</td></tr>
<tr><th colspan="5">DISSOLVED OXYGEN</th></tr>
<tr><td colspan="2">Make: YSI 5</td><td colspan="3">Model: /</td></tr>
<tr><td colspan="2">Date of calibration: 10/08/23</td><td colspan="3">Name of Calibrator: CB</td></tr>
<tr><td colspan="5">Span value: 70% to 130%</td></tr>
<tr><td colspan="5">Measured value: 109 %</td></tr>
<tr><td colspan="5">Measured reading Acceptable (Yes/No):</td></tr>
<tr><th colspan="5">pH</th></tr>
<tr><td colspan="2">Make: YSI 5</td><td colspan="3">Model: /</td></tr>
<tr><td colspan="2">Date of calibration: 10/08/23</td><td colspan="3">Name of Calibrator: CB</td></tr>
<tr><td colspan="2">Buffer 1: Theoretical pH = 7.01± 0.01</td><td colspan="2">Expiry date: Aug 23</td><td>Lot No: 384001</td></tr>
<tr><td colspan="2">Buffer 2: Theoretical pH = 4.01± 0.01</td><td colspan="2">Expiry date: May 24</td><td>Lot No: 398326</td></tr>
<tr><td colspan="5">Measured reading of Buffer 1: 6.98</td></tr>
<tr><td colspan="5">Measured reading of Buffer 2: 3.91</td></tr>
<tr><td colspan="2">Slope:</td><td colspan="3">Measured reading Acceptable (Yes/No):</td></tr>
<tr><th colspan="5">EC</th></tr>
<tr><td colspan="2">Make: YSI 5</td><td colspan="3">Model: /</td></tr>
<tr><td>Date: 10/08/23</td><td colspan="3">Name of Calibrator: CB</td><td>Temperature: 15.8 °C</td></tr>
<tr><td colspan="2">Calibration solution: Conductivity standard</td><td colspan="2">Expiry date: Sep.23</td><td>Lot No: 386922</td></tr>
<tr><td colspan="5">Theoretical conductivity at temperature (see solution container): 1170 µS/cm</td></tr>
<tr><td colspan="2">Measured conductivity: 1166 µS/cm</td><td colspan="3">Measured reading Acceptable (Yes/No):</td></tr>
<tr><th colspan="5">REDOX</th></tr>
<tr><td colspan="2">Make: YSI 5</td><td colspan="3">Model: /</td></tr>
<tr><td colspan="2">Date of calibration: 10/08/23</td><td colspan="3">Name of Calibrator: CB</td></tr>
<tr><td colspan="2">Calibration solution: Hannah Instruments</td><td colspan="2">Expiry date: 07/23</td><td>Lot No: 8169</td></tr>
<tr><td colspan="5">Theoretical redox value: 240mV</td></tr>
<tr><td colspan="2">Measured redox reading: 240.1 mV</td><td colspan="3">Measured reading Acceptable (Yes/No):</td></tr>
</table>

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Client:	Time & Place Development Pty Ltd	**Job No.:**	E34303B
Project:	Proposed Residential Development	**Well No.:**	MW1
Location:	45-53 Macleay Street, POTTS POINT, NSW	**Depth (m):**	15.12m

WELL FINISH DETAILS

	Gatic Cover ☒	Standpipe ☐	Other (describe) ☐

WELL DEVELOPMENT DETAILS

Method:	Development pump	**SWL – Before (m):**	1.89m
Date:	04/08/23	**Time – Before:**	9:54am
Undertaken By:	AD	**SWL – After (m):**	Dry
Total Vol. Removed:	50L	**Time – After:**	10:20am
PID Reading (ppm):	14		

Comments:

DEVELOPMENT MEASUREMENTS

Volume Removed (L)	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
2	19.5	14.4	195.9	6.16	-144.1
4	20.6	7.9	231.7	6.19	-144.1
6	20.8	6.7	205.3	5.98	-145.7
8	20.8	4.3	190.0	5.75	-147.8
10	20.9	3.5	187.7	5.70	-148.2
12	20.9	3.1	186.9	5.67	-149.3
14	20.9	2.8	186.2	5.66	-149.0
16	20.8	2.5	185.3	5.64	-150.7
18	20.8	2.3	183.8	5.62	-151.4
20	20.7	2.1	181.9	5.60	-152.0
22	20.6	2.0	180.0	5.58	-152.7
24	20.2	2.6	169.3	5.66	-148.7
26	20.3	1.3	182.3	5.64	-149.6
28	20.1	1.2	179.7	5.59	-150.7
30	20.1	1.2	175.9	5.52	-152.7
32	19.8	1.2	170.0	5.46	-153.8
34	19.8	1.1	166.3	5.42	-154.9
36	19.8	2.7	158.6	5.54	-145.3
38	20.5	2.9	168.8	5.52	-145.6
40	20.6	3.8	162.5	5.51	-146.6
42	20.6	3.5	160.5	5.53	-147.9
44	20.7	2.9	173.4	5.58	-148.7
46	20.8	4.6	169.7	5.60	-148.6

Comments: Odours (YES / NO) NAPL/PSH (YES / NO) Sheen (YES / NO) Steady State Achieved (YES / NO)

YSI Used: 5

High silt load, recharge observed

Tested By:	AD	**Remarks:**
Date Tested:	04/08/23	- Steady state conditions - Difference in the pH less than 0.2 units, difference in the conductiveity less than 10% and SWL stable/not in drawdown
Checked By:	**VB**	- Minimum 3 monitoring well volumes purged, unless well purged until it is effectively dry
Date:	**5/09/23**	

48	20.9	2.2	178.2	5.65	-153.2
50	21.3	5.5	211.8	6.04	-157.5

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Client:	Time & Place Development Pty Ltd	**Job No.:**	E34303B
Project:	Proposed Residential Development	**Well No.:**	MW2
Location:	45-53 Macleay Street, POTTS POINT, NSW	**Depth (m):**	11.28m

WELL FINISH DETAILS

Gatic Cover ☒ Standpipe ☐ Other (describe) ☐

WELL DEVELOPMENT DETAILS

Method:	Development pump	**SWL – Before (m):**	1.52m
Date:	04/08/23	**Time – Before:**	8:57am
Undertaken By:	AD	**SWL – After (m):**	Dry
Total Vol. Removed:	28L	**Time – After:**	9:16am
PID Reading (ppm):	1.4		

Comments:

DEVELOPMENT MEASUREMENTS

Volume Removed (L)	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
2	19.5	8.0	214.3	5.93	-58.2
4	21.0	6.0	216.2	5.85	-56.8
6	21.1	6.0	213.2	5.78	-56.6
8	21.0	5.9	212.5	5.78	-57.7
10	20.9	5.8	208.2	5.73	-57.9
12	20.6	5.8	203.1	5.67	-58.1
14	20.3	5.7	197.5	5.60	-58.6
16	19.9	5.5	193.3	5.51	-58.9
18	19.4	5.2	198.7	5.50	-57.9
20	19.2	5.3	187.7	5.39	-56.0
22	19.5	5.6	183.4	5.40	-60.8
24	20.0	5.2	187.5	5.47	-61.5
26	20.3	5.3	191.6	5.63	-62.1
28	20.5	5.3	188.4	5.69	-62.7

Comments: Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)

YSI Used: 5

High silt load, recharge observed

Tested By:	AD	**Remarks:**
Date Tested:	04/08/23	- Steady state conditions - Difference in the pH less than 0.2 units, difference in the conductiveity less than 10% and SWL stable/not in drawdown - Minimum 3 monitoring well volumes purged, unless well purged until it is effectively dry
Checked By:	VB	
Date:	5/09/23	

JKEnvironments

Client:	Time & Place Development Pty Ltd	Job No.:	E34303B
Project:	Proposed Residential Development	Well No.:	MW3
Location:	45-53 Macleay Street, POTTS POINT, NSW	Depth (m):	11m

WELL FINISH DETAILS

Gatic Cover ☒ Standpipe ☐ Other (describe) ☐

WELL DEVELOPMENT DETAILS

Method:	Development Pump	SWL – Before (m):	1.01m
Date:	04/08/23	Time – Before:	10:33am
Undertaken By:	AD	SWL – After (m):	9.6m
Total Vol. Removed:	30L	Time – After:	10:50am
PID Reading (ppm):	1.6		

Comments:

DEVELOPMENT MEASUREMENTS

Volume Removed (L)	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
2	19.6	4.1	359.1	6.83	-125.2
4	20.9	2.7	358.2	6.79	-128.4
6	21.1	2.3	355.4	6.70	-130.7
8	21.2	2.1	357.2	6.70	-132.3
10	21.2	2.0	355.9	6.67	-133.9
12	21.2	1.8	351.3	6.65	-135.9
14	21.2	1.7	351.3	6.65	-137.6
16	21.2	1.6	350.1	6.64	-139.3
18	21.0	1.5	347.9	6.63	-141.1
20	20.7	1.7	349.0	6.53	-117.6
22	20.7	1.7	311.0	6.31	-124.7
24	20.9	1.5	294.0	6.28	-130.8
26	20.1	3.7	268.2	6.17	-127.8
28	21.2	4.4	272.0	6.17	-130.8
30	21.6	10.4	302.5	6.40	-133.7

Comments: Odours (YES / NO) NAPL/PSH (YES / NO) Sheen (YES / NO), Steady State Achieved (YES / NO)

YSI Used: 5

High silt load, pumped dry, recharge observed

Tested By:	AD	**Remarks:**
Date Tested:	04/08/23	- Steady state conditions - Difference in the pH less than 0.2 units, difference in the conductiveity less than 10% and SWL stable/not in drawdown
Checked By:	VB	- Minimum 3 monitoring well volumes purged, unless well purged until it is effectively dry
Date:	5/09/23	

JKEnvironments

Client:	Time & Place Development Pty Ltd	**Job No.:**	E34303B
Project:	Proposed Residential Development	**Well No.:**	MW1
Location:	45-53 Macleay Street, POTTS POINT, NSW	**Depth (m):**	15.12m

WELL FINISH

X	Gatic Cover		Standpipe		Other (describe)

WELL PURGE DETAILS:

Method:	Peripump	**SWL – Before:**	2.19m
Date:	10/08/23	**Time – Before:**	7.46
Undertaken By:	CB	**Total Vol Removed:**	7.5L
Pump Program No:	/	**PID (ppm):**	3.3

PURGING / SAMPLING MEASUREMENTS

Time (min)	SWL (m)	Vol (L)	Notes	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
8.16	2.30	0.5		18.1	2.4	245.0	5.46	-52.3
8.20	2.41	1.0		18.6	2.0	226.0	5.35	-63.1
8.24	2.55	1.5		19.0	2.0	215.1	5.30	-82.7
8.28	2.64	2.0		19.0	1.8	210.6	5.29	-103.5
8.32	2.71	2.5		19.1	3.1	208.3	5.28	-125.8
8.36	2.79	3.0		19.1	1.8	206.9	5.28	-139.0
8.40	2.83	3.5		19.1	1.7	205.7	5.28	-147.0
8.44	2.89	4.0		19.1	1.6	204.6	5.27	-156.9
8.48	2.94	4.5		19.1	1.6	203.1	5.25	-163.7
8.52	2.99	5.0	pumpe slowed down	19.1	1.5	200.7	5.22	-169.3
8.56	3.00	5.25		19.0	1.4	199.1	5.20	-173.5
9.00	3.02	5.5		18.9	1.4	197.2	5.14	-176.8
9.04	3.03	5.75	pump speed up	19.0	1.3	193.5	5.13	-180.2
9.08	3.01	6.0		18.8	1.4	193.4	5.09	-180.2
9.12	3.02	6.5		18.8	1.4	192.5	5.06	-183.6
9.16	3.02	7.0		18.8	2.6	190.1	5.05	-184.2
9.20	3.02	7.5		18.7	1.5	188.9	5.05	-186.5
			started sampling					

Comments: Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)

Sampling Containers Used: 1 x glass amber, 4 x BTEX vials, 1 x HNO3 plastic, x H2SO4 plastic, 1 x unpreserved plastic 2x PFAS

YSI used: 5 W DUP1 1 x glass amber, 4 BTEX vials, 1 x HNO3, 2x PFAS

Tested By: Alexis Diodati	**Remarks:**
Date Tested: 10/08/23	- Steady state conditions
Checked By: VB	- difference in the pH less than 0.2 units, difference in conductivity less than 10%
Date: 5/09/23	10% and SWL stable/not in drawdown

JKEnvironments

Client:	Time & Place Development Pty Ltd	**Job No.:**	E34303B
Project:	Proposed Residential Development	**Well No.:**	MW2
Location:	45-53 Macleay Street, POTTS POINT, NSW	**Depth (m):**	11.28m

WELL FINISH

X	Gatic Cover		Standpipe		Other (describe)

WELL PURGE DETAILS:

Method:	Peri pump	**SWL – Before:**	1.41m
Date:	10/08/23	**Time – Before:**	9.41 am
Undertaken By:	CB	**Total Vol Removed:**	4L
Pump Program No:	/	**PID (ppm):**	0.5

PURGING / SAMPLING MEASUREMENTS

Time (min)	SWL (m)	Vol (L)	Notes	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
10:00am	1.52	0.5		18.5	4.1	182.8	4.79	-166.6
10.04	1.66	1.0		19.3	3.2	186.5	4.75	-170.9
10.08	1.77	1.5	pump slowed down	19.4	3.0	186.4	4.74	-172.0
10.12	1.87	2.0		19.2	2.6	185.6	4.74	-177.1
10.16	1.86	2.5		19.1	2.6	184.4	4.74	-184.3
10.20	1.89	3.0		19.1	2.6	184.2	4.74	-164.9
10.24	1.89	3.5		19.0	2.7	183.6	4.74	167.6
10.28	1.88	4.0		19.0	2.7	183.1	4.74	171.4
			started sampling					

Comments: Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)

Sampling Containers Used: 1 **x glass amber,** 4 **x BTEX vials,** 1 **x HNO3 plastic, x H2SO4 plastic,** 1 **x unpreserved plastic** 2x PFAS

YSI used: 5 1x glass amber 4x BTEX vials, 1 x HNO3, 2x PFAS

Tested By: Alexis Diodati	**Remarks:**
Date Tested: 10/08/23	- Steady state conditions
Checked By: **VB**	- difference in the pH less than 0.2 units, difference in conductivity less than 10%
Date: **5/09/23**	10% and SWL stable/not in drawdown

JKEnvironments

Client:	Time & Place Development Pty Ltd	**Job No.:**	E34303B
Project:	Proposed Residential Development	**Well No.:**	MW3
Location:	45-53 Macleay Street, POTTS POINT, NSW	**Depth (m):**	11m

WELL FINISH

X	Gatic Cover		Standpipe		Other (describe)

WELL PURGE DETAILS:

Method:	Peri pum	**SWL – Before:**	0.99
Date:	10/8/23	**Time – Before:**	10.45
Undertaken By:	CB	**Total Vol Removed:**	~3L
Pump Program No:	/	**PID (ppm):**	0.4

PURGING / SAMPLING MEASUREMENTS

Time (min)	SWL (m)	Vol (L)	Notes	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
11.00 am	0.99	0.5		19.5	5.0	402.1	6.54	-178.6
11.04	0.99	1.0		20.0	1.9	410.8	6.55	-185.0
11.08	0.99	1.5		20.3	1.4	415.2	6.54	188.6
11.12	0.99	2.0		20.3	1.3	416.8	6.54	-190.9
			Started sampling					

Comments: Odours (YES / NO) NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)

Sampling Containers Used: 1 **x glass amber,** 4 **x BTEX vials,** 1 **x HNO3 plastic, x H2SO4 plastic,** 1 **x unpreserved plastic** 2 x Pfas

YSI used: 5

Tested By: Alexis Diodati	**Remarks:**
Date Tested: 10/8/23	- Steady state conditions
Checked By: VB	- difference in the pH less than 0.2 units, difference in conductivity less than 10%
Date: 5/09/23	10% and SWL stable/not in drawdown

Appendix I: UCL Calculation Sheets

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.15/09/2023 1:54:32 PM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

C-PAHs

General Statistics

Total Number of Observations	11	Number of Distinct Observations	4
Number of Detects	3	Number of Non-Detects	8
Number of Distinct Detects	3	Number of Distinct Non-Detects	1
Minimum Detect	0.6	Minimum Non-Detect	0.5
Maximum Detect	26	Maximum Non-Detect	0.5
Variance Detects	211.7	Percent Non-Detects	72.73%
Mean Detects	9.2	SD Detects	14.55
Median Detects	1	CV Detects	1.582
Skewness Detects	1.731	Kurtosis Detects	N/A
Mean of Logged Detects	0.916	SD of Logged Detects	2.045

Warning: Data set has only 3 Detected Values.

This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.762	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.767	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.38	Lilliefors GOF Test
5% Lilliefors Critical Value	0.425	Detected Data appear Normal at 5% Significance Level

Detected Data appear Approximate Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	2.873	KM Standard Error of Mean	2.701
KM SD	7.315	95% KM (BCA) UCL	N/A
95% KM (t) UCL	7.769	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	7.316	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	10.98	95% KM Chebyshev UCL	14.65
97.5% KM Chebyshev UCL	19.74	99% KM Chebyshev UCL	29.75

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.489	k star (bias corrected MLE)	N/A
Theta hat (MLE)	18.81	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	2.934	nu star (bias corrected)	N/A
Mean (detects)	9.2		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	2.516
Maximum	26	Median	0.01
SD	7.796	CV	3.098
k hat (MLE)	0.185	k star (bias corrected MLE)	0.195

	A–E	F	G–K	L
62	Theta hat (MLE)	13.59	Theta star (bias corrected MLE)	12.89
63	nu hat (MLE)	4.073	nu star (bias corrected)	4.296
64	Adjusted Level of Significance (β)	0.0278		
65	Approximate Chi Square Value (4.30, α)	0.842	Adjusted Chi Square Value (4.30, β)	0.627
66	95% Gamma Approximate UCL (use when n>=50)	12.84	95% Gamma Adjusted UCL (use when n<50)	N/A
67				
68	**Estimates of Gamma Parameters using KM Estimates**			
69	Mean (KM)	2.873	SD (KM)	7.315
70	Variance (KM)	53.51	SE of Mean (KM)	2.701
71	k hat (KM)	0.154	k star (KM)	0.173
72	nu hat (KM)	3.393	nu star (KM)	3.801
73	theta hat (KM)	18.63	theta star (KM)	16.63
74	80% gamma percentile (KM)	3.472	90% gamma percentile (KM)	8.643
75	95% gamma percentile (KM)	15.34	99% gamma percentile (KM)	34.26
76				
77	**Gamma Kaplan-Meier (KM) Statistics**			
78	Approximate Chi Square Value (3.80, α)	0.645	Adjusted Chi Square Value (3.80, β)	0.469
79	95% Gamma Approximate KM-UCL (use when n>=50)	16.94	95% Gamma Adjusted KM-UCL (use when n<50)	23.3
80				
81	**Lognormal GOF Test on Detected Observations Only**			
82	Shapiro Wilk Test Statistic	0.85	**Shapiro Wilk GOF Test**	
83	5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
84	Lilliefors Test Statistic	0.34	**Lilliefors GOF Test**	
85	5% Lilliefors Critical Value	0.425	Detected Data appear Lognormal at 5% Significance Level	
86	**Detected Data appear Lognormal at 5% Significance Level**			
87				
88	**Lognormal ROS Statistics Using Imputed Non-Detects**			
89	Mean in Original Scale	2.513	Mean in Log Scale	-5.684
90	SD in Original Scale	7.797	SD in Log Scale	5.239
91	95% t UCL (assumes normality of ROS data)	6.774	95% Percentile Bootstrap UCL	7.187
92	95% BCA Bootstrap UCL	9.55	95% Bootstrap t UCL	109
93	95% H-UCL (Log ROS)	5.411E+12		
94				
95	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**			
96	KM Mean (logged)	-0.254	KM Geo Mean	0.775
97	KM SD (logged)	1.128	95% Critical H Value (KM-Log)	3.25
98	KM Standard Error of Mean (logged)	0.417	95% H-UCL (KM -Log)	4.675
99	KM SD (logged)	1.128	95% Critical H Value (KM-Log)	3.25
100	KM Standard Error of Mean (logged)	0.417		
101				
102	**DL/2 Statistics**			
103	**DL/2 Normal**		**DL/2 Log-Transformed**	
104	Mean in Original Scale	2.691	Mean in Log Scale	-0.758
105	SD in Original Scale	7.734	SD in Log Scale	1.411
106	95% t UCL (Assumes normality)	6.918	95% H-Stat UCL	7.043
107	**DL/2 is not a recommended method, provided for comparisons and historical reasons**			
108				
109	**Nonparametric Distribution Free UCL Statistics**			
110	**Detected Data appear Approximate Normal Distributed at 5% Significance Level**			
111				
112	**Suggested UCL to Use**			
113	95% KM (t) UCL	7.769		
114				
115	When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test			
116	When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL			
117				
118	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
119	Recommendations are based upon data size, data distribution, and skewness.			
120	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			
121	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.			
122				

Appendix J: Guidelines and Reference Documents

Acid Sulfate Soils Management Advisory Committee (ASSMAC), (1998). Acid Sulfate Soils Manual

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

Canadian Council of Ministers of the Environment, (1999). Canadian soil quality guidelines for the protection of environmental and human health: Benzo(a)Pyrene (1997)

CRC Care, (2011). Technical Report No. 10 – Health screening levels for hydrocarbons in soil and groundwater Part 1: Technical development document

Contaminated Land Management Act 1997 (NSW)

Department of Land and Water Conservation, (1997). 1:25,000 Acid Sulfate Soil Risk Map Series

Managing Land Contamination, Planning Guidelines SEPP55 – Remediation of Land (1998)

National Health and Medical Research Council (NHMRC), (2021). National Water Quality Management Strategy, Australian Drinking Water Guidelines 2011

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

NSW EPA, (2014). Waste Classification Guidelines - Part 1: Classifying Waste

NSW EPA, (2015). Guidelines on the Duty to Report Contamination under Section 60 of the CLM Act 1997

NSW EPA, (2017). Guidelines for the NSW Site Auditor Scheme, 3rd Edition

NSW EPA, (2020). Consultants Reporting on Contaminated Land, Contaminated Land Guidelines

NSW EPA, (2022). *Sampling design part 1 - application*, Contaminated Land Guidelines

National Environment Protection Council (NEPC), (2013). National Environmental Protection (Assessment of Site Contamination) Measure 1999 as amended (2013)

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

Protection of the Environment Operations Act 1997 (NSW)

State Environmental Planning Policy (Resilience and Hazards) 2021 (NSW)

World Health Organisation (WHO), (2008). Petroleum Products in Drinking-water, Background document for the development of WHO Guidelines for Drinking Water Quality

Western Australia Department of Health, (2021). Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia