REPORT TO

NSW DEPARTMENT OF EDUCATION

ON

DETAILED SITE CONTAMINATION INVESTIGATION

FOR

PARRAMATTA EAST PUBLIC SCHOOL (PEPS) UPGRADE

AT

30-32 BRABYN STREET, NORTH PARRAMATTA, NSW

Date: 28 February 2025
Ref: E35073BR2rpt.Rev5

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Executive Summary

This Detailed Site Contamination Investigation (DSI) report has been prepared by JK Geotechnics (JKG) on behalf of NSW Department of Education to assess the potential environmental impacts that could arise from the Parramatta East Public School (PEPS) upgrade (the proposal) at 30-32 Brabyn Street, North Parramatta (the Site). The works are proposed by the NSW Department of Education to meet the growth in educational demand in Collet Park precinct, and the broader North Parramatta area.

This report has been prepared to assess the suitability of the site for the proposed upgrades from a contamination perspective, with regards to Chapter 4 of State Environmental Planning Policy (Resilience and Hazards) 2021. It is understood that the DSI will support the Review of Environmental Factors (REF) for the proposed activity.

The activity comprises upgrades to PEPS to provide replacement teaching facilities in place of the existing temporary and permanent facilities that are no longer fit for purpose, involving the following works:

- Site preparation and required earthworks;
- Demolition of existing buildings C, D, E and F and associated structures including adjacent ramps and walkways;
- Construction of the following:
  - A new 3-storey school building (referred to as Block R) including teaching spaces, library/administration, and staff/student amenities;
  - Upgrade of soft and hard landscape and playground areas;
  - A new at-grade parking area;
  - Formalised waste area, with access being retained from Gaggin Street;
  - Public Domain Works with upgrades to pedestrian access south of the school, and new kiss and ride zone on Albert Street East;
  - Entrance and School logo signage along the Northern Albert Street East frontage of Block R;
- Refurbishment works to existing buildings;
- Removal of trees and retention where possible; and
- Installation and augmentation of services and infrastructure as required.

Refer to the REF prepared by Ethos Urban for a full description of works.

The site is located at Brabyn Street within the City of Parramatta Local Government Area. PEPS is located in the suburb of North Parramatta, within the City of Parramatta Local Government Area (LGA). The site is approximately 1.5km north-east of the Parramatta CBD, and 24km west of the Sydney CBD.

The site currently comprises a single lot to make up PEPS, referred to as Lot 100, DP1312418, and is owned by the Minister for Education and Early Learning.

The site has an area of approximately 1.782Ha, is of an irregular shape, and is bounded by Brabyn Street to the west, Albert Street East to the north, and Gaggin Street/Webb Street to the East. The project area is contained within the site and represents where the proposed works will be undertaken, with an area of approximately 1.492Ha. The project area boundaries are shown on Figure 2 attached in the appendices.

Based on the identification of potential issues, and an assessment of the nature and extent of the impacts of the proposed activity, it is determined that:

- The extent and nature of potential impacts are moderate and could have significant impact on the locality, community and/or the environment; and
- Potential impacts can be appropriately mitigated and managed to ensure that there is minimal impact on the locality, community and/or the environment.

The primary aims of the revised DSI are to characterise the soil and groundwater contamination and dryland salinity conditions, and to assess the potential for acid sulfate soils (ASS) to be disturbed during the upgrade works.

The investigation included a review of historical information, soil and groundwater data, and ASS and dryland salinity information presented in the JKG 2022 DSI. This information was reviewed in the context of the proposed activity within the project area boundaries.

The investigation typically encountered asphaltic concrete (AC) pavement and fill soils to depths of approximately 0.1m below ground level (BGL) to 0.75mBGL, underlain by residual silty and sandy clay soils. Sandstone bedrock was encountered beneath the residual soils in 11 boreholes and extended to the terminal depths of the boreholes at approximately 1mBGL to 8mBGL, and was extremely weathered on first contact. The fill typically comprised of sandy gravel and silty and sandy clay with inclusions of gravel, sand, ash, slag, building rubble (concrete, brick, metal, fibre cement, ceramic tile, plastic and glass) and root fibres. Groundwater seepage was encountered in three boreholes at depths of approximately 0.3mBGL to 3.3mBGL.

Monitoring wells were installed in three locations (BH/MW1, BH/MW3 and BH/MW6) during the 2022 DSI. The standing water level (SWL) measured in the wells during development and sampling ranged from approximately 2.6mBGL to 3.65mBGL. Groundwater RLs calculated on these measurements ranged from approximately 17.5m Australian Height Datum (AHD) to 21.8mAHD.

The investigation identified fill soils impacted by asbestos (in the form of bonded/non-friable) and total recoverable hydrocarbons (TRH) at concentrations that trigger the need for remediation. The investigation also identified a potential for additional asbestos-related finds (in the form of bonded/non-friable and friable asbestos) and carcinogenic polycyclic aromatic hydrocarbons (PAHs) to be encountered within the fill soils.

Based on the findings of the investigation, JKG is of the opinion that the project area can be made suitable for the proposed activity, via remediation. The following is included as mitigation measures:

- Prepare an Asbestos Management Plan (AMP) to outline the management strategy for addressing the potential risks posed by asbestos. This must be prepared by a SafeWork NSW licensed Asbestos Assessor (LAA);
- Prepare a Remediation Action Plan (RAP) to address the contamination issues identified within the site and to provide a framework to address the data gaps outline in this report following demolition and prior to proceeding with remediation; and
- Prepare a validation assessment report documenting the remediation works undertaken at the site.

At this stage, JKG consider that there is no requirement to notify the NSW EPA under the Duty to Report Contamination within the bounds of the project area, provided the mitigation measures in this report are implemented. The duty to report is to be reassessed following the results of the asbestos air monitoring, and following remediation.

The investigation also assessed the potential for ASS and the dryland salinity conditions to be disturbed during the upgrade works at the site. The investigation concluded that Potential ASS (PASS) and Actual ASS (AASS) conditions that that would be expected to pose a risk to the environment if disturbed during the proposed upgrade works were not identified. JKG is of the opinion that an ASS Management Plan (ASSMP) is not required for the proposed activity.

The investigation identified that the soils and rock at the site are classed as non-saline and non-aggressive towards buried steel. The soils and rock at the site are classed as moderately aggressive to buried concrete. The groundwater beneath the site is mildly aggressive to buried concrete and non-aggressive to buried steel. Based on the investigation, JKG is of the opinion that a Salinity Management Plan (SMP) is not required for the proposed activity. However, the salinity results should be considered by the design team to assess impacts on foundations and built structures.

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

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Abbreviations

Actual Acid Sulfate Soils	**AASS**
Ambient Background Concentrations	**ABC**
Asphaltic Concrete	**AC**
Added Contaminant Limits	**ACL**
Asbestos Containing Material	**ACM**
Australian Drinking Water Guidelines	**ADWG**
Area of Environmental Concern	**AEC**
Asbestos Fines/Fibrous Asbestos	**AF/FA**
Australian Height Datum	**AHD**
Asbestos Management Plan	**AMP**
Acid Sulfate Soil	**ASS**
ASS Management Plan	**ASSMP**
Before You Dig Australia	**BYDA**
Below Ground Level	**BGL**
Benzo(a)pyrene Toxicity Equivalent Factor	**BaP TEQ**
Borehole	**BH**
Benzene, Toluene, Ethylbenzene, Xylene	**BTEX**
Cement, Concrete and Aggregates Australia	**CCAA**
Complying Development Certificate	**CDC**
Cation Exchange Capacity	**CEC**
Contaminated Land Management	**CLM**
Contaminant(s) of Potential Concern	**CoPC**
Chain of Custody	**COC**
Covered Outdoor Learning Area	**COLA**
Conceptual Site Model	**CSM**
Development Application	**DA**
Department of Land and Water Conservation	**DLWC**
Data Quality Indicator	**DQI**
Data Quality Objective	**DQO**
Detailed Site Investigation	**DSI**
Electrical Conductivity	**EC**
Extract Electrical Conductivity	**ECe**
Ecological Investigation Level	**EIL**
Ecological Screening Level	**ESL**
Environment Protection Authority	**EPA**
Exchangeable Sodium Potential	**ESP**
Fibre Cement Fragment(s)	**FCF**
Geotechnical Investigation	**GI**
Groundwater Investigation Level	**GIL**
Hazardous Building Materials	**HAZMAT**
Health Investigation Level	**HIL**
Health Screening Level	**HSL**
International Organisation of Standardisation	**ISO**
JK Geotechnics	**JKG**
Licensed Asbestos Assessor	**LAA**
Lab Control Spike	**LCS**
Light Non-Aqueous Phase Liquid	**LNAPL**
Map Grid of Australia	**MGA**
Monitoring Well	**MW**
National Association of Testing Authorities	**NATA**
National Environmental Management Plan	**NEMP**
National Environmental Protection Measure	**NEPM**
Organochlorine Pesticides	**OCP**

Organophosphate Pesticides	**OPP**
Polycyclic Aromatic Hydrocarbons	**PAH**
Precision, Accuracy, Representativeness, Completeness, Comparability	**PARCC**
Potential ASS	**PASS**
Polychlorinated Biphenyls	**PCB**
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**
Reduced/Relative Level	**RL**
Review of Environmental Factors	**REF**
Site Assessment Criteria	**SAC**
Sampling, Analysis and Quality Plan	**SAQP**
Specific Contaminant Concentration	**SCC**
State Environmental Planning Policy	**SEPP**
Salinity Management Plan	**SMP**
Source, Pathway, Receptor	**SPR**
Site-Specific AMP	**SSAMP**
Standing Water Level	**SWL**
Trip Blank	**TB**
Toxicity Characteristic Leaching Procedure	**TCLP**
Total Recoverable Hydrocarbons	**TRH**
Trip Spike	**TS**
Upper Confidence Limit	**UCL**
Urban Residential and Public Open Space	**URPOS**
Virgin Excavated Natural Material	**VENM**
Volatile Organic Compounds	**VOC**
Western Australian Department of Health	**WA DoH**
World Health Organisation	**WHO**
Work Health and Safety	**WHS**

Units

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

1 INTRODUCTION AND DECLARATION

1.1 Introduction

This Detailed Site Contamination Investigation (DSI) report has been prepared by JK Geotechnics (JKG) on behalf of NSW Department of Education to assess the potential environmental impacts that could arise from the Parramatta East Public School (PEPS) upgrade (the proposal) at 30-32 Brabyn Street, North Parramatta (the Site). The works are proposed by the NSW Department of Education to meet the growth in educational demand in Collet Park precinct, and the broader North Parramatta area.

This report has been prepared to assess the suitability of the site for the proposed upgrades from a contamination perspective, with regards to Chapter 4 of State Environmental Planning Policy (Resilience and Hazards) 2021[1]. It is understood that the DSI will support the Review of Environmental Factors (REF) for the proposed activity.

1.2 Summary of the Activity

The activity comprises upgrades to PEPS to provide replacement teaching facilities in place of the existing temporary and permanent facilities that are no longer fit for purpose, involving the following works:

- Site preparation and required earthworks;
- Demolition of existing buildings C, D, E and F and associated structures including adjacent ramps and walkways;
- Construction of the following:
    - A new 3-storey school building (referred to as Block R) including teaching spaces, library/administration, and staff/student amenities;
    - Upgrade of soft and hard landscape and playground areas;
    - A new at-grade parking area;
    - Formalised waste area, with access being retained from Gaggin Street;
    - Public Domain Works with upgrades to pedestrian access south of the school, and new kiss and ride zone on Albert Street East;
    - Entrance and School logo signage along the Northern Albert Street East frontage of Block R;
- Refurbishment works to existing buildings;
- Removal of trees and retention where possible; and
- Installation and augmentation of services and infrastructure as required.

Refer to the REF prepared by Ethos Urban for a full description of works.

1.3 Site Description

The site is located at Brabyn Street within the City of Parramatta Local Government Area. PEPS is located in the suburb of North Parramatta, within the City of Parramatta Local Government Area (LGA). The site is approximately 1.5km north-east of the Parramatta CBD, and 24km west of the Sydney CBD.

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

The site currently comprises a single lot to make up PEPS, referred to as Lot 100, DP1312418, and is owned by the Minister for Education and Early Learning.

The site has an area of approximately 1.782Ha, is of an irregular shape, and is bounded by Brabyn Street to the west, Albert Street East to the north, and Gaggin Street/Webb Street to the East. The project area is contained within the site and represents where the proposed works will be undertaken, with an area of approximately 1.492Ha. An aerial image of the site is shown at Figure 1-1 below.



Figure 1-1: Site Aerial

Source: Nearmap, Ethos Urban

1.4 Significance of Environmental Impacts

Based on the identification of potential issues, and an assessment of the nature and extent of the impacts of the proposed activity, it is determined that:

- The extent and nature of potential impacts are moderate and could have significant impact on the locality, community and/or the environment; and
- Potential impacts can be appropriately mitigated and managed to ensure that there is minimal impact on the locality, community and/or the environment.

1.5 Background

JKG has previously completed a DSI for the wider school property in September 2022 (refer to Figures 1 to 4 in the appendices). The purpose of this revised DSI is to review the findings of the JKG 2022 DSI in the context of the updated upgrade details, project area boundaries, and revised site assessment criteria (SAC). JKG

understand that the revised DSI is subject to review by an NSW EPA accredited site auditor. The client has engaged Ms Melissa Porter of Senversa to complete the audit.

JKG have previously undertaken a Preliminary Site Contamination Investigation (PSI) for the wider school property in 2022. A summary of this information has been included in Section 2. A geotechnical investigation was undertaken in conjunction with the JKG 2022 DSI. The results of the geotechnical investigation (GI) are presented in a separate report (Ref: 35073LTrpt)[2]. This report should be read in conjunction with the GI report.

1.6 Aims and Objectives

The primary aims of the revised DSI are to characterise the soil and groundwater contamination and dryland salinity conditions, and to assess the potential for acid sulfate soils (ASS) to be disturbed during the proposed activity. The objectives were to:

- Review the existing PSI and DSI data;
- Assess the potential risks posed by contamination to the receptors identified in the Conceptual Site Model (CSM) (Tier 1 assessment);
- 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 activity (from a contamination viewpoint);
- Assess whether further intrusive investigation and/or remediation is required; and
- Establish the need for a Salinity Management Plan (SMP) and/or the need for an ASS Management Plan (ASSMP).

1.7 Scope of Work

The scope of work included the following:

- Review of site information and site history information presented in the PSI and JKG 2022 DSI reports;
- Review and update (if required) the CSM;
- Interpretation of the analytical results against the adopted Site Assessment Criteria (SAC);
- Data Quality Assessment; and
- Preparation of a report including a Tier 1 risk assessment.

The scope of work was undertaken with reference to the National Environmental Protection (Assessment of Site Contamination) Measure 1999 as amended (2013)[3], other guidelines made under or with regards to the Contaminated Land Management Act (1997)[4] and SEPP Resilience and Hazards 2021. A list of reference documents/guidelines is included in the appendices.

[2] JKG, (2024d). *Report to NSW Department of Education School Infrastructure on Geotechnical Investigation for Proposed Redevelopment at Parramatta East Public School, Brabyn Street, North Parramatta, NSW.* (Ref: 35073LTrpt, dated 26 September 2022) (referred to as JKG GI report)

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

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

2 SITE INFORMATION

2.1 Previous Investigations

2.1.1 Preliminary Site Investigation (PSI)

JKG previously prepared a PSI for the wider school in 2022[5]. The scope of work included a desktop review of historical information and a site walkover inspection. The site history information indicated that the wider school property was historically used for agricultural (grazing) purposes prior to the 1940s. Between the 1940s and 1970s, the property was subdivided and used for residential purposes and the construction of a primary school. By the 1990s, the wider property was occupied solely by the existing primary school.

The site history review and walkover inspection identified the following areas of environmental concern (AEC)/potential contamination sources:

- Historical filling of the wider property;
- Historical agricultural use of the wider property;
- Use of pesticides beneath buildings and around the wider property; and
- Hazardous building materials present within current and former buildings within the wider property.

During the walkover inspection, a fibre cement fragment (FCF) suspected to be asbestos containing material (ACM) was observed on the site and collected for analysis. The FCF (FCF1) was subsequently analysed with the soil samples collected during the DSI (discussed further in Section 2.1.2 below) and was confirmed to contain asbestos.

JKG recommended the following:

- Undertake a DSI to better characterise the site contamination conditions and establish whether remediation is required; and
- Undertake a Hazardous Building Material (HAZMAT) survey of the existing buildings.

2.1.2 Detailed Site Investigation (DSI)

JKG previously prepared a DSI for the wider property in 2022[6]. The scope of work included a review of the JKG 2022 PSI, soil sampling from 30 locations (BH1 to BH5, BH7 and BH101 to BH124) and groundwater sampling from three groundwater monitoring wells (MW1, MW3 and MW6) installed within the wider property. The sampling locations are shown on Figure 2 attached in Appendix A.

The investigation identified asbestos in bonded/non-friable and asbestos fines/fibrous asbestos (AF/FA) (considered to be friable asbestos) in the fill soils in several locations, total recoverable hydrocarbons (TRH) F2 fraction in fill soils in one location, and polycyclic aromatic hydrocarbons (PAHs) in fill soils in another location, at concentrations above the human health-based SAC.

The investigation also identified TRH F2 in fill soils in one location, zinc in fill soils in another location, and the TRH F4 in fill soils in four locations at concentrations which exceeded the ecological-based SAC.

[5] JKG (2022a). *Report to Schools Infrastructure on Preliminary (Stage 1) Site Contamination Investigation for Proposed School Redevelopment at Parramatta East Public School, Parramatta, NSW*. (Ref: E35073Brpt, dated 12 July 2022) (Referred to as JKG 2022 PSI)

[6] JKG (2022c). *Report to Schools Infrastructure NSW on Detailed (Stage 2) Site Contamination Investigation for Proposed School Redevelopment at Parramatta East Public School, Parramatta, NSW.* (Ref: E35073Brpt3, dated 14 September 2022) (Referred to as JKG 2022 DSI)

The investigation identified the pH of the groundwater was below the lower threshold for ecological receptors and recreational/incidental contact, and concentrations of nickel and zinc in the groundwater samples collected from two monitoring wells exceeded the ecological-based SAC. The pH and nickel and zinc concentrations were considered likely to be associated with ambient groundwater conditions within an urban setting and did not pose an unacceptable risk to receptors in the context of the proposed development.

The SAC exceedances are shown on Figure 3 attached in Appendix A.

JKG note that the SAC have been revised and the PFOS concentrations recorded in the groundwater exceed the revised SAC for ecological receptors. This is discussed further in Section 9.1.2.1 of this report.

The investigation also identified that the ASS results indicated that the soils were indicative of acid soils associated with organic/humic material rather than ASS materials, and that an ASSMP was not required. The dryland salinity results indicated that the soils were non-saline and that the groundwater was within the marginal river water type. The soils were moderately aggressive towards buried concrete and the groundwater was mildly aggressive towards buried concrete. The soils and groundwater were non-aggressive towards buried steel.

Based on the findings of the investigation, the report provided the following recommendations:

- Prepare a Remediation Action Plan (RAP) to address the contamination issues identified within the wider property;
- Prepare and implement an Asbestos Management Plan (AMP). The AMP must be prepared by a Licensed Asbestos Assessor (LAA);
- Undertake a HAZMAT survey of the existing buildings; and
- Undertake a validation assessment and prepare a validation report documenting the remediation works.

Interim measures were also recommended and completed by SI to minimise the potential for asbestos exposure prior to remediation.

2.2 Site Identification

Table 2-1: Site Identification

Site Address:	Parramatta East Public School, 30-32 Brabyn Street, North Parramatta, NSW
Lot & Deposited Plan:	Part of Lot 100 in DP1312418
Current Land Use:	Educational establishment
Proposed Land Use:	Education establishment
Local Government Area:	City of Parramatta
Current Zoning:	R3 – Medium Density Residential

Project Area (Ha) (approx.):	1.492
RL (AHD in m) (approx.):	16-25
Geographical Location – NW Corner of Project Area (decimal degrees) (approx.):	Latitude: -33.805186 Longitude: 151.01721
Site Plans:	Appendix A

2.3 Summary of Site Setting and Description

The wider site is located in a predominantly residential area of North Parramatta and is bounded by Brabyn Street to the west, Albert Street East to the north, and Gaggin Street and Webb Street to the east. The project area is located within the central and northern portions of the wider school property and is approximately 1km to the north of the Parramatta River. The regional topography is characterised by a south facing hillside that falls towards the Parramatta River. The wider site is located towards the peak of the hill and grades down to the south at approximately 4°. Parts of the wider site and project area appear to have been levelled to account for the slope and accommodation the existing development.

A walkover inspection of the wider property (including the project area) was undertaken by JKG on 16 June 2022 for the PSI. At the time of the fieldworks for the DSI in July 2022, the wider property had remained generally unchanged since the PSI. JKG assume the wider site conditions remain generally unchanged since the last inspection. A summary of the key observations is presented below:

- At the time of the inspection, the wider site was utilised as a primary school with associated buildings and outdoor play space;
- The buildings were constructed from a variety of materials, including concrete, brick, glass and fibre cement and appeared to be in good to average condition;
- Exposed fill was observed at the surface in some areas, with inclusions of gravel and concrete; and
- The southern portion of the wider property was predominantly vacant and grass covered. Some trees were observed in the south and along the property boundaries and appeared to be generally in good health based on a cursory inspection.

During the inspection for the PSI, JKG observed the following land uses in the immediate surrounds:

- North – Albert Street East, with residential (1-2 storey detached and semi-detached housing) beyond;
- South – The wider school property, with residential (1-2 storey detached and semi-detached housing) beyond;
- East – Gaggin Street and Webb Street, with residential (1-2 storey detached and semi-detached housing) and a public reserve (playground) beyond; and
- West – Brabyn Street, with residential (1-2 storey detached and semi-detached housing and townhouse/villa complexes) beyond.

JKG did not observe any land uses in the immediate surrounds that were identified as potential off-site contamination sources.

2.4 Underground Services

The 'Before You Dig Australia' (BYDA) plans were reviewed for the 2022 DSI in order to establish whether any major underground services exist at the wider 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.

2.5 Summary of Geology and Hydrogeology

2.5.1 Regional Geology

Regional geological information presented in the PSI indicated that the wider site is underlain by Ashfield Shale of the Wianamatta Group, which typically consists of black to dark grey shale and laminite.

2.5.2 Acid Sulfate Soil (ASS) Risk and Planning

ASS risk mapping information presented in the PSI indicated that the wider site is not located within a risk area.

ASS planning information presented in the PSI indicated that the wider 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.

JKG note that no Class 1,2,3,4 land was mapped within 500m of the wider site.

2.5.3 Dryland Salinity Mapping

Dryland salinity risk information presented in the PSI indicated that the wider site is located in an area mapped as having moderate salinity potential. The moderate classification is attributed to scattered areas of scalding and indicator vegetation, in areas where concentrations have not been mapped. Saline areas may occur in this zone, which have not been identified or may occur if risk factors change adversely.

2.5.4 Hydrogeology

Hydrogeological information presented in the PSI indicated that:

- The subsurface conditions at the wider site were expected to consist of moderate to high permeability (alluvial) soils overlying shallow bedrock. The potential for viable groundwater abstraction and use of groundwater under these conditions is considered to be low. There is a reticulated water supply in the area and consumption of groundwater is not expected to occur. Use of groundwater within the wider site is not proposed as far as we are aware;
- The nearest registered bore was located approximately 520m to the south-west of the wider site and was registered for monitoring purposes;
- There were no nearby bores (i.e. within 1.2km of the wider site) registered for water supply uses; and
- Considering the local topography and surrounding land features, JKG anticipated groundwater flow towards the south-west.

2.5.5 Receiving Water Bodies

Surface water bodies were not identified in the immediate vicinity of the wider site. The nearest down-gradient surface water body is Parramatta River which is located approximately 1km to the south of the wider site. Due to the distance from the wider site, the Parramatta River is unlikely to be a receptor that could be impacted by direct migration of groundwater.

3 SUMMARY OF SITE HISTORY INFORMATION

3.1 Review of Council Records

Council records were sourced under an informal access to information request and were reviewed for the investigation. The council records indicate the following:

- A DA was lodged and approved in 1992 for the demolition and reconstruction of an amenities building (DA4122/1992);
- A DA was lodged and approved in 2000 to construct an extension to the existing school library and remove two trees (DA1345/2000);
- A DA was lodged in 2005 to construct a shade structure over the children's playground. The DA was approved in 2006 (DA/1153/2005); and
- A Complying Development Certificate (CDC) was issued for construction of a communal hall and covered outdoor learning area (COLA) in 2009 (CD/158/2009).

3.2 Summary of Site History Information

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

Table 3-1: Summary of Historical Land Uses / Activities

Year(s)	On-site - Potential Land Use / Activities	Off-site - Potential Land Use / Activities
1930-1943	Agricultural (grazing), subdivision and construction of residential properties within the southern portion of the wider school property.	Agricultural (grazing) and residential subdivision.
1943-1970	Subdivision of the site with construction of both primary school buildings, and residential properties within the wider school property.	Large scale residential subdivision of area. An electrical substation (Endeavour Energy Parramatta Field) was located approximately 250m down-gradient and to the south-west of the site. There were three motor garage/service stations located greater than 100m down-gradient of the wider site.
1970-1991	Primary school, demolition and clearing of southern residential properties into school playground area.	Residential, substation (mentioned above) and motor garage/service stations (mentioned above).
1994-2002	Primary school with construction of several new buildings and a playground.	Residential and substation (mentioned above). Demolition of motor garages (mentioned above) with construction of commercial or high density residential.
2002-2025	As above	As above

4 CONCEPTUAL SITE MODEL

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

A review of the CSM in relation to source, pathway and receptor (SPR) linkages has been undertaken as part of the Tier 1 risk assessment process, as outlined in Section 9.

4.1 Potential Contamination Sources/AEC and CoPC

The potential contamination sources/AEC and CoPC are presented in the following table:

Table 4-1: Potential (and/or known) Contamination Sources/AEC and Contaminants of Potential Concern

Source / AEC	CoPC
Fill material – The wider site including the project area appears to have been historically filled to achieve the existing levels. The fill may have been imported from various sources and could be contaminated.	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. JKG note that the 2022 DSI encountered elevated concentrations of selected CoPC and as outlined in Section 2.1.2.
Historical agricultural use – The wider site including the project area appears to have been used for grazing and market garden purposes. This could have resulted in contamination across the site via use of machinery, application of pesticides and building/ demolition of various structures. Irrigation pipes made from asbestos cement may also be associated with this AEC.	Heavy metals, TRH, PAHs, OCPs, PCBs and asbestos. JKG note that OCPs only became commercially available in the 1940s. Prior to this time pesticides were predominantly heavy metal compounds.
Use of pesticides – Pesticides may have been used beneath the buildings and/or around the wider site including the project area.	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 wider site including the project area.	Asbestos, lead and PCBs. JKG note that the 2022 DSI encountered asbestos elevations in soil in the bonded (ACM) and friable forms (AF/FA) as outlined in Section 2.1.2.

4.2 Mechanism for Contamination, Affected Media, Receptors and Exposure Pathways

The mechanisms for contamination, affected media, receptors and exposure pathways relevant to the potential contamination sources/AEC are outlined in the following CSM table:

Table 4-2: CSM

Potential mechanism for contamination	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.
Affected media	Soil has been identified as the potentially affected medium. The potential for groundwater impacts is considered to be relatively low. However, groundwater would need to be considered in the event significant contamination was identified in soil. JKG note that groundwater was assessed for completeness.
Receptor identification	Human receptors include site users (including adults and children), construction workers and intrusive maintenance workers. Off-site human receptors include adjacent land users, and possibly recreational water users within the Parramatta River. Ecological receptors include terrestrial organisms and plants within unpaved areas (including the proposed landscaped areas), and possibly estuarine ecology in Parramatta River.
Potential exposure pathways	Potential exposure pathways relevant to the human receptors include ingestion, dermal absorption and inhalation of dust (all contaminants) and vapours (volatile TRH, naphthalene and BTEX). 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/direct contact and ingestion. Exposure during future site use could occur via direct contact with soil in unpaved areas such as gardens, inhalation of airborne asbestos fibres during soil disturbance, or inhalation of vapours within enclosed spaces such as buildings. Exposure to groundwater is unlikely to occur in the Parramatta River through direct migration, however groundwater exposure has been considered for completeness.
Potential exposure mechanisms	The following have been identified as potential exposure mechanisms for site contamination: • Vapour intrusion into the proposed buildings (either from soil contamination or volatilisation of contaminants from groundwater); • Contact (dermal, ingestion or inhalation) with exposed soils in landscaped areas and/or unpaved areas; and • Migration of groundwater off-site and into nearby water bodies, including aquatic ecosystems and those being used for recreation.
Presence of preferential pathways for contaminant movement	Major services (i.e. on the BYDA plans) were not identified that would be expected to act as preferential pathways for contamination migration. However, it is noted that localised services are likely to exist that are not shown on those plans and the details of such services must be reviewed/considered in further detail in the event mobile contamination is identified.

5 SAMPLING, ANALYSIS AND QUALITY PLAN

5.1 Summary of SAQP

JKG prepared a stand-alone SAQP for the JKG 2022 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 1.6;
- Soil samples were obtained from 30 locations (BH1 to BH5, BH7 and BH101 to BH124 inclusive) generally spread across the wider school property, as shown on Figure 2 attached in the SAQP appendices (within Appendix J of this report);
- A grid-pattern overlay was prepared for the wider school property and locations were judgementally selected from within each grid. The sampling locations were set out using a hand-held GPS (with an accuracy of ±0.1m);
- Soil samples were obtained using a combination of a drill rig equipped with spiral flight augers, a hydraulic powered drilling rig (push tube sampling methods) and hand tools;
- Soil samples were obtained between 12 and 21 July 2022;
- Groundwater monitoring wells were installed in three locations (BH/MW1, BH/MW3 and BH/MW6), generally spread across the site as shown on Figure 2 attached in the SAQP appendices (within Appendix J of this report);
- The groundwater monitoring wells were developed on 20 July 2022 using a submersible electric pump;
- Groundwater samples were obtained 27 July 2022 using low-flow sampling techniques; and
- Soil and groundwater samples were submitted to NATA accredited laboratories for analysis.

Due to the heterogeneous nature of fill soils and the extent of works required for the proposed activity, including drainage works within most of the project area, all contamination, dryland salinity and ASS data collected for the DSI has been reviewed and included within this revised DSI.

5.2 Laboratory Details

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

Table 5-1: Laboratory Details

Samples	Laboratory	Report Reference
All primary samples and field QA/QC samples including (intra-laboratory duplicate soil sample, trip blanks, trip spikes and field rinsate samples)	Envirolab Services Pty Ltd NSW, NATA Accreditation Number – 2901 (ISO/IEC 17025 compliance)	300587, 300587-A, 300587-B, 300587-C, 300836, 300836-A, 300836-B, 300836-C, 300836-D, 300836-E, 301048, 301048-A, and 301640.
Inter-laboratory soil and water duplicates	Envirolab Services Pty Ltd VIC, NATA Accreditation Number – 2901 (ISO/IEC 17025 compliance)	32570, and 32850

Samples	Laboratory	Report Reference
Inter-laboratory soil duplicate	Envirolab Services (WA) Pty Ltd, NATA Accreditation Number – 2901 (ISO/IEC 17025 compliance)	285674
Inter-laboratory water duplicate (PFAS analysis)	ALS Life Sciences Environmental NSW NATA Accreditation Number – 825 (ISO/IEC 17025 compliance)	ES2227140

6 SITE ASSESSMENT CRITERIA (SAC)

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

6.1 Soil Contamination

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

6.1.1 Human Health

- Health Investigation Levels (HILs) for a 'residential with accessible soils' exposure scenario (HIL-A). These criteria are also applicable to primary schools;
- Health Screening Levels (HSLs) for a 'low-high density residential' exposure scenario (HSL-A & HSL-B). HSLs were calculated based on conservative assumptions including a 'sand' type and a depth interval of 0m to 1m;
- HIL-A criteria were adopted for PFAS assessment based on Table 2 in The PFAS National Environmental Management Plan (NEMP) Version 2.0 2020[7];
- 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)[8]; and
- Asbestos was assessed against the HSL-A criteria. A summary of the asbestos criteria is provided in the table below:

Table 6-1: Details for Asbestos SAC

Guideline	Applicability
Asbestos in Soil	The HSL-A criteria were adopted for the assessment of asbestos in soil. The SAC adopted for asbestos were derived from the NEPM 2013 and are based on the Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2021)[9]. The SAC include the following: • No visible asbestos at the surface/in the top 10cm of soil; • <0.01% w/w bonded asbestos containing material (ACM) in soil; and • <0.001% w/w asbestos fines/fibrous asbestos (AF/FA) in soil. Concentrations for bonded ACM concentrations in soil are based on the following equation which is presented in Schedule B1 of NEPM (2013): $$\text{\% w/w asbestos in soil} = \frac{\text{\% asbestos content x bonded ACM (kg)}}{\text{Soil volume (L) x soil density (kg/L)}}$$

[7] Heads of EPAs Australia and New Zealand (HEPA). PFAS National Environmental Management Plan Version 2.0 - January 2020 (referred to as NEMP 2020)

[8] 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*

[9] 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
	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): **% w/w asbestos in soil =** $\frac{\text{**% asbestos content x bonded ACM (g)**}}{\text{Soil weight (g)}}$

6.1.2 Environment (Ecological – terrestrial ecosystems)

- Ecological Investigation Levels (EILs) and Ecological Screening Levels (ESLs) for an 'urban residential and public open space' (URPOS) exposure scenario. These have only been applied to the top 2m of soil as outlined in NEPM (2013). The criterion for benzo(a)pyrene has been increased from the value presented in NEPM (2013) based on the Canadian Soil Quality Guidelines[10];
- ESLs were adopted based on the soil type;
- The ecological (indirect exposure) guidelines for soil were adopted for PFAS assessment based on Table 3 in NEMP 2020;
- EILs for selected metals were calculated based on the most conservative added contaminant limit (ACL) values presented in Schedule B(1) of NEPM (2013) and published ambient background concentration (ABC) values presented in the document titled Trace Element Concentrations in Soils from Rural and Urban Areas of Australia (1995)[11]. This method is considered to be adequate for the Tier 1 screening; and
- Where EIL exceedances were recorded for selected metals and cation exchange capacity (CEC) and/or pH data were available for the dryland salinity investigation, these data were used to select alternative ACL values presented in Schedule B(1) of NEPM (2013). Where data for specific samples were not available, the arithmetic average values for these parameters were adopted based on the soil type (i.e. silty clay, sandy gravel). These data are presented in Table S6 attached in the appendices.

6.1.3 Management Limits for Petroleum Hydrocarbons

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

6.1.4 Waste Classification

Data for the waste classification assessment were assessed in accordance with the Waste Classification Guidelines, Part 1: Classifying Waste (2014)[12] as outlined in the following table:

[10] 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)

[11] 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

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

Table 6-2: 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 must be undertaken to classify the soil as hazardous waste; and • If TCLP > TCLP2 and/or SCC > SCC2 then treat as hazardous waste.
Virgin Excavated Natural Material (VENM)	Natural material (such as clay, gravel, sand, soil or rock fines) that meet the following: • That has been excavated or quarried from areas that are not contaminated with manufactured chemicals, or with process residues, as a result of industrial, commercial mining or agricultural activities; • That does not contain sulfidic ores or other waste; and • Includes excavated natural material that meets such criteria for virgin excavated natural material as may be approved from time to time by a notice published in the NSW Government Gazette.

The PFAS data were assessed against the NSW EPA Addendum to the Waste Classification Guidelines (2014) – Part 1: classifying waste[13].

6.2 Groundwater Contamination

Groundwater data were compared to relevant Tier 1 screening criteria in accordance with NEPM (2013), following an assessment of environmental values in accordance with the Guidelines for the Assessment and Management of Groundwater Contamination (2007)[14]. Environmental values for this investigation include aquatic ecosystems, human uses (incidental contact and recreational water use), and human-health risks in non-use scenarios (vapour intrusion).

6.2.1 Human Health

- HSLs for a 'low-high density residential' exposure scenario (HSL-A/HSL-B). HSLs were calculated based on the soil type and the observed depth to groundwater;
- The Australian Drinking Water Guidelines 2011 (updated 2021)[15] were multiplied by a factor of 10 to assess potential risks associated with incidental/recreational-type exposure to groundwater (e.g. within down-gradient water bodies, or with bore water used for irrigation). These have been deemed as 'recreational' SAC; and
- The recreational water quality guideline value was adopted for PFAS assessment based on Table 1 in NEMP 2020.

[13] NSW EPA, (2016). *Addendum to the Waste Classification Guidelines (2014) – Part 1: classifying waste*

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

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

6.2.2 Environment (Ecological - aquatic ecosystems)

Groundwater Investigation Levels (GILs) for 95% protection of marine species were adopted based on the Default Guideline Values in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2018)[16]. The 99% trigger values were adopted where required to account for bioaccumulation. Low and moderate reliability trigger values were also adopted for some contaminants where high-reliability trigger values don't exist. The protection values for marine species were considered appropriate as the down-gradient waterbody (the Parramatta River) is an estuarine environment.

The ecological (freshwater) water quality guidelines were adopted for PFAS assessment based on NEMP 2020, based on 99% protection (to account for bioaccumulation of PFAS in slightly to moderately disturbed systems).

6.3 Acid Sulfate Soil

6.3.1 Field Tests

The soil field tests commonly used for investigations for ASS materials include field pH (pH_F) and field pH peroxide (pH_{FOX}) tests. The pH_F test can help identify Actual ASS. While a pH_F of less than or equal to pH 4 is indicative of the presence of Actual ASS, it is not conclusive of the presence of ASS on its own, as naturally occurring, non-ASS soils such as many organic soils (for example peats) and heavily leached soils may also have pH_F less than or equal to pH 4. To identify Actual ASS other evidence must be presented that indicates the low pH_F has been mainly caused by the oxidation of reduced inorganic sulfur. Such information includes the presence of jarosite in the soil layer/horizon, or the location of other Actual ASS or PASS materials within the sampling location or in the nearby vicinity.

The difference between the pH_F and the pH_{FOX} is helpful in the preliminary identification of PASS. Combined, the pH_F and pH_{FOX} results can be a useful aid with soil sample selection for laboratory analysis. Additional Information in relation to interpretation of the pH field tests is provided in the appendices.

6.3.2 Action Criteria

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:

[16] 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)

Table 6-3: ASS Action Criteria Based on Soil Texture and Volume of Material Being Disturbed

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.

The action criteria for large volumes of material disturbance (i.e. >1,000 tonnes) were used for this assessment.

6.4 Dryland Salinity

6.4.1 Soil Salinity and Plant Growth

The electrical conductivity (EC) of a 1:5 soil:water extract is commonly used as an indicator of soil salinity conditions as the reading is directly related to the electrolyte (salt) concentration of the extract. In order to compare the laboratory data with published salinity classes, the results are converted to equivalent saturated paste (ECe) using texture adjustment values presented in the Department of Land and Water Conservation (DLWC) *Site Investigations for Urban Salinity*[17]. The following table provides a summary of plant response with reference to salinity:

Table 6-4: Plant Response to Soil Salinity

ECe (dS/m)	Salinity Class	Plant Response[1]
<2	Non-saline	Salinity effects mostly negligible
2-4	Slightly saline	Yields of very sensitive crops may be affected
4-8	Moderately saline	Yield of many crops affected
8-16	Very saline	Only tolerant crops yield satisfactorily
>16	Highly saline	Only a few very tolerant crops yield satisfactorily

Note:

1 - Plant Response to Salinity Class has been adopted from DLWC 2002

[17] Department of Land and Water Conservation (DLWC), (2002). *Site Investigations for Urban Salinity,* (referred to as DLWC 2002)

6.4.2 Soil pH and Plant Growth

Soil pH is a measure of the acidity or alkalinity of the soils and values have been assessed as an indicator of soil fertility with respect to plant growth. The optimal pH for plant growth is between 5.5 and 7. Beyond this range, effective revegetation of exposed soil following disturbance is increasingly difficult and the potential for erosion is considered to increase.

Highly alkaline soils are commonly associated with saline and sodic soil conditions and can limit the ability of plants to take up water and nutrients. Highly acidic soils exhibit aluminium toxicity toward plants and can limit the ability of plants to take up other essential nutrients including molybdenum.

Interpretation of soil pH with respect to plant growth is undertaken using the ratings published in Bruce and Rayment (1982)[18] presented below:

Table 6-5: Plant Response to Soil pH

pH	Rating
<4.5	Extremely acidic
4.5-5.0	Very strongly acidic
5.1-5.5	Strongly acidic
5.6 – 7.3	Optimal plant growth
7.4-7.8	Mildly alkaline
7.9-8.4	Moderately alkaline
8.5-9.0	Strongly alkaline
>9.1	Very strongly alkaline

6.4.3 Cation Exchange Capacity (CEC) in Soil

The ability of soils to attract, retain and exchange cations (positively charged ions) is estimated by the calculated cation exchange capacity (CEC) value. CEC represents the major controlling factor in stability of clay soil structure, nutrient availability for plant growth, soil pH and the reaction of the soil to chemical applications (fertilisers, conditioners etc.).

High CEC soils have a greater capacity to retain nutrients, however, deficient soils require greater applications of nutrients to correct imbalances. Low CEC soils have a reduced capacity to retain nutrients and may result in leaching of nutrients from the soil in the event of excess nutrient applications.

[18] Bruce, R.C. and Rayment, G.E., (1982). *Analytical Methods and Interpretations used by the Agricultural Chemistry Branch for Soil and Land Use Surveys,* (referred to as Bruce and Rayment 1982)

Metson (1961)[19] developed a set of ratings for effective CEC and the most abundant cations. These are summarised below (values are in meq/100g):

Table 6-6: CEC Rating

Rating	eCEC	Exch Na	Exch K	Exch Ca	Exch Mg
Very low	<6	0-0.1	0-0.2	0-2	0-0.3
Low	6-12	0.1-0.3	0.2-0.3	2-5	0.3-1
Moderate	12-25	0.3-0.7	0.3-0.7	5-10	1-3
High	25-40	0.7-2	0.7-2	10-20	3-8
Very high	>40	>2	>2	>20	>8

6.4.4 Ratio of Exchangeable Calcium to Magnesium

To maintain soil structure there should be a ratio of around 4:1 to 6:1 calcium to magnesium for a balanced soil (Eckert 1987)[20]. At ratios of less than 4:1 calcium is considered to be deficient, whilst at ratios of greater than 6:1 are considered to be magnesium deficient.

6.4.5 Exchangeable Sodium Percentage or Sodicity (ESP%)

Exchangeable sodium is an important soil stability and salinity parameter. Excessive exchangeable sodium leads to unstable soils, increased runoff, potential salinity, dispersivity and water logging problems.

Normally the sodium content is expressed as a percentage of the CEC as other cations counteract the negative effects of sodium (known as ESP% and termed sodicity). The effect of the exchangeable sodium (exchangeable sodium percentage, ESP) varies with other soil factors such as the type of clay, the relative quantity of magnesium and the quantity of organic matter. However, Charman & Murphy (2000[21]) indicate that a soil is generally considered sodic if the ESP exceeds 6% and extremely sodic if the ESP exceeds 15%.

6.4.6 Groundwater Salinity

EC values in groundwater are dependent on numerous factors and can vary with changes in temperature and pH conditions. Suttar (1990[22]) has classed water into different types based on EC values as outlined in the following table.

[19] Metson, A.J, (1961). *Methods of Chemical Analysis for Soil Survey Samples* (referred to as Metson 1961)

[20] Eckert, D.J, (1987) .*Soil Test Interpretation: Basic Cation Saturation Ratios and Sufficiency Levels* (referred to as Eckert 1987)

[21] Charman, P.E.V and Murphy, B.W (eds), (2000).*Soils: Their Management and Properties,* (referred to as Charman and Murphy 2000)

[22] Suttar, S., (1990). *Ribbons of Blue Handbook, Scitech*, Victoria (referred to as Suttar 1990)

Table 6-7: EC Ranges in Water

Water Type	EC (µS/cm)
Deionised Water	0.5 – 3
Pure Rainwater	<15
Freshwater Rivers	0 – 800
Marginal River Water	800 – 1600
Brackish Water	1600 – 4800
Saline Water	>4800
Seawater	51,500
Industrial Waters	100 – 10,000

6.4.7 Recommendations for Concrete Slabs and Footings in Saline Soils

In the absence of endorsed recommendations for buildings in saline environments, reference is made to the Cement, Concrete and Aggregates Australia (CCAA) *Industry Gude T56: Residential Slabs and footings in Saline Environments*[23]. The guide provides recommendations on the minimum concrete grade/strength required for slabs and footings in saline soils. Reference should be made to the CCAA 2018 publication for further information:

Table 6-8: Minimum Concrete Grade for Slabs and Footings in Saline Soils

ECe (dS/m)	Salinity Class	Concrete Grade[1]
<2	Non-saline	N20
2-4	Slightly saline	N20
4-8	Moderately saline	N25
8-16	Very saline	N32
>16	Highly saline	≥N40

Note:

1 - Concrete Grade for Salinity Class has been adopted from CCAA 2018

6.4.8 Recommendations for Durability with Reference to AS2159-2009

In designing for durability, reference should be made to the requirements listed in the AS2159-2009. The exposure classification for concrete and steel piles and foundations is outlined in the following tables.

[23] Cement, Concrete and Aggregates Australia (CCAA), (2018). Industry Guide *T56: Residential Slabs and Footings in Saline Environments* (referred to as CCAA 2018)

Table 6-9: Exposure Classification for Concrete Piles

Exposure Conditions				Exposure Classification	
Sulphate (expressed as SO_4)		pH	Chlorides in Groundwater (ppm)	Soil Conditions A[1]	Soil Conditions B[2]
In Soil (ppm)	In Groundwater (ppm)				
<5,000	<1,000	>5.5	<6,000	Mild	Non-aggressive
5,000-10,000	1,000-3,000	4.5-5.5	6,000-12,000	Moderate	Mild
10,000-20,000	3,000-10,000	4-4.5	12,000-30,000	Severe	Moderate
>20,000	>10,000	<4	>30,000	Very severe	Severe

Notes:

1 - High permeability soils (e.g. sands and gravels) which are in groundwater

2 – Low permeability soils (e.g. silts and clays) or all soils above groundwater

Table 6-10: Exposure Classification for Steel Piles

Exposure Conditions				Exposure Classifications	
pH	Chlorides		Resistivity (ohm.cm)	Soil Conditions A[1]	Soil Conditions B[2]
	In Soil (ppm)	In Groundwater (ppm)			
>5	<5,000	<1,000	>5,000	Non-aggressive	Non-aggressive
4-5	5,000-20,000	1,000-10,000	2,000-5,000	Mild	Non-aggressive
3-4	20,000-50,000	10,000-20,000	1,000-2,000	Moderate	Mild
<3	>50,000	>20,000	<1,000	Severe	Moderate

Notes:

1 - High permeability soils (e.g. sands and gravels) which are in groundwater

2 – Low permeability soils (e.g. silts and clays) or all soils above groundwater

7 RESULTS

7.1 Summary of Data (QA/QC) Evaluation

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

7.2 Subsurface Conditions

A summary of the subsurface conditions encountered during the 2022 DSI is presented in the following table. Reference should be made to the borehole logs attached in the appendices for further details.

Table 7-1: Summary of Subsurface Conditions

Profile	Description
Pavement	Asphaltic Concrete (AC) pavement was encountered at the surface in BH2 to BH5, BH105, BH106, BH109 and BH110 and ranged in thickness from approximately 15mm to 40mm.
Fill	Fill was encountered at the surface or beneath the pavement in all boreholes and extended to depths of approximately 0.1m to 0.75m below ground level (BGL). The fill typically comprised of sandy gravel and silty and sandy clay with inclusions of igneous and ironstone gravel, sand, ash, slag, building rubble (concrete, brick, metal, FCF, ceramic tile, plastic and glass) and root fibres. FCF was encountered in BH116, BH118, and BH120 to BH122. No stained or odorous fill was encountered during the investigation.
Natural Soil	Residual silty and/or sandy clay was encountered beneath the fill in all boreholes. BH101 to BH107, BH109 to BH114, and BH117 to BH124 were terminated in the residual silty clay soils at depths of approximately 0.45m to 1.5mBGL. No stained or odorous soils were encountered during the investigation.
Bedrock	Sandstone bedrock was encountered beneath the residual soils in BH1 to BH8, BH108, BH115 and BH116 and extended to the terminal depths of the boreholes at approximately 1mBGL to 8mBGL. The bedrock was extremely weathered on first contact, generally becoming highly to distinctly weathered within 1-2m. Reference should be made to the JKG geotechnical report for further details in this regard.
Groundwater	Groundwater seepage was encountered in BH3, BH101 and BH103 at depths of approximately 0.3mBGL to 3.3mBGL. All remaining boreholes were dry on completion of auger drilling and a short time after. BH2 and BH5 were extended to depths of approximately 8mBGL using rock coring methods. Potable water is introduced during the coring process which inhibits meaningful groundwater observations on completion of these boreholes.

7.3 Field Screening

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

Table 7-2: Summary of Field Screening

Aspect	Details
PID Screening of Soil Samples for volatile organic compounds (VOCs)	PID soil sample headspace readings are presented in attached report tables and the COC documents attached in the appendices. The results ranged from 0ppm to 1.5ppm equivalent isobutylene. These results indicate a general lack of PID detectable VOCs.
Bulk Screening for Asbestos	The bulk field screening results are summarised in the attached report Table S5. The ACM concentrations in fill soil samples collected from BH116 (0-0.1m), BH118 (0-0.1m), BH120 (0-0.1m and 0.1-0.4m), and BH122 (0-0.1m) exceeded the SAC. In addition to these samples, visible ACM was observed in the surficial fill soil sample collected from BH121 (0-0.1m). This is also considered an SAC exceedance. All other results were below the SAC.
Groundwater Depth & Flow	The approximate surface levels of the monitoring wells were interpolated from spot heights and contours on the provided survey plan and are shown on the borehole logs in the appendices. Standing water levels (SWLs) measured in MW1, MW3 and MW6 during well development and sampling ranged from approximately 2.6mBGL to 3.65mBGL. Groundwater RLs calculated on these measurements ranged from approximately 17.5mAHD to 21.8mAHD. A contour plan was prepared for the groundwater levels, as shown on Figure 4 attached in the appendices. Groundwater flow generally occurs in a down-gradient direction perpendicular to the groundwater elevation contours. The contour plot infers that groundwater generally flow towards south. An additional well was installed in MW7, though it is noted that this well was dry for the duration of the investigation.
Groundwater Field Parameters	Field measurements recorded during development and sampling were as follows: - pH ranged from 4.74 to 5.3; - EC ranged from 155µS/cm to 1,578µS/cm; - Eh ranged from 16.7 mV to 150.3mV; and - DO ranged from 0.8ppm to 5.1ppm. The PID readings in the monitoring well headspace recorded during development and sampling ranged from 0.9ppm to 41.5ppm. The maximum PID reading was recorded in MW6, located within the west of the wider school property. The elevated PID reading could be associated with the interference from water vapour. A potential fuel source was not detected in the vicinity of MW6.
LNAPLs petroleum hydrocarbons	Phase separated product (i.e. LNAPL) was not detected using the interphase probe during groundwater sampling.

7.4 Soil Contamination Laboratory Results

The soil laboratory results were assessed against the SAC presented in Section 6.1. Individual SAC are shown in the report tables attached in the appendices. A summary of the results is presented below:

7.4.1 Human Health and Environmental (Ecological) Assessment

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

Analyte	N	Max. (mg/kg)	N> Human Health SAC	N> Ecological SAC	Comments
Arsenic	30	32	0	0	-
Cadmium	30	0.6	0	NSL	-
Chromium (total)	30	31	0	0	-
Copper	30	200	0	0	-
Lead	30	120	0	0	-
Mercury	30	0.4	0	NSL	-
Nickel	30	34	0	0	-
Zinc	30	590	0	0	-
Total PAHs	31	60	0	NSL	-
Benzo(a)pyrene	31	3	NSL	0	-
Carcinogenic PAHs (as BaP TEQ)	31	4.6	1	NSL	The carcinogenic PAH concentration recorded in one fill soil sample collected from BH107 (0-0.1m) exceeded the human health SAC of 3mg/kg.
Naphthalene	30	<1	0	NSL	-
DDT+DDE+DDD	30	<0.1	0	NSL	-
DDT	30	<0.1	NSL	0	-
Aldrin and dieldrin	30	2	0	NSL	Aldrin and dieldrin was recorded in one fill sample collected from BH115 (0-0.1m). The concentration was 2mg/kg which is equal to the threshold for classification as scheduled chemical waste in accordance with the NSW EPA (2004) *Scheduled Chemical Wastes Chemical Control Order 2004*[24]. Though

[24] NSW EPA (2004). *Chemical control order in relation to scheduled chemical wastes.* (referred to as Scheduled Chemical Wastes CCO 2004)

Analyte	N	Max. (mg/kg)	N> Human Health SAC	N> Ecological SAC	Comments
					below the HILs, as the concentration was equal to the threshold, JKG consider the fill soils should be managed in accordance with the provisions of the Scheduled Chemical Wastes CCO 2004.
Chlordane	30	<0.1	0	NSL	-
Heptachlor	30	<0.1	0	NSL	-
Chlorpyrifos (OPP)	30	<0.1	0	NSL	-
PCBs	30	<0.1	0	NSL	-
TRH F1	30	<25	0	0	-
TRH F2 TRH F2 (Silica Gel Clean-up)	30 1	240 160	1 1	1 1	The TRH F2 concentration recorded in one fill soil sample collected from BH123 (0-0.1m and laboratory duplicate sample) exceeded the human health SAC of 110mg/kg and the ecological SAC of 120mg/kg. Silica gel clean-up was undertaken to isolate potential interference from organic material and polar compounds. The TRH F2 (silica gel) concentrations recorded in one fill soil sample collected from BH123 (0-0.1m and laboratory duplicate) exceeded the human health SAC of 110mg/kg and the ecological SAC of 120mg/kg.
TRH F3	30	890	0	4	TRH F3 concentrations recorded in four fill soil samples collected from BH3 (0.04-0.1m), BH4 (0.04-0.3m), BH105 (0.02-0.1m) and BH106 (0.02-0.1m) exceeded the ecological SAC of 300mgk/kg.
TRH F4	30	940	0	0	-
Benzene	30	<0.2	0	0	-
Toluene	30	<0.5	0	0	-
Ethylbenzene	30	<1	0	0	-
Xylenes	30	<1	0	0	-

Analyte	N	Max. (mg/kg)	N> Human Health SAC	N> Ecological SAC	Comments
PFOS	6	5.7 µg/kg	NSL	0	-
PFOS + PFHxS	6	5.7 µg/kg	0	NSL	-
PFOA	6	0.4 µg/kg	0	0	-
Asbestos (in soil) (%w/w)	30	ACM 0.1037 AF/FA 0.0013	2 1	NA NA	The FCF/ACM concentrations recorded in two fill soil samples collected from BH1 (0-0.1m) and BH122 (0-0.1m) exceeded the human heath SAC of 0.01%w/w. The AF/FA concentration recorded in one fill soil sample collected from BH120 (0-0.1m) exceeded the human health SAC of 0.001%w/w.

Notes:

N: Total number (primary samples)

NSL: No set limit

NL: Not limiting

7.4.2 Waste Classification Assessment

The laboratory results were assessed against the criteria presented in Section 6.1.4. The results are presented in the report tables attached in the appendices. A summary of the results is presented in the following table:

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

Analyte	N	N > CT Criteria	N > SCC Criteria	Comments
Arsenic	30	0	0	-
Cadmium	30	0	0	-
Chromium	30	0	0	-
Copper	30	NSL	NSL	-
Lead	30	1	0	The lead concentration in one fill soil sample collected from BH119 (0-0.15m) exceeded the CT1 criterion of 100mg/kg.
Mercury	30	0	0	-
Nickel	30	0	0	-
Zinc	30	NSL	NSL	-

Analyte	N	N > CT Criteria	N > SCC Criteria	Comments
TRH (C_6-C_9)	30	0	0	-
TRH (C_{10}-C_{36})	30	0	0	-
BTEX	30	0	0	-
Total PAHs	31	0	0	-
Benzo(a)pyrene	31	3	0	The benzo(a)pyrene concentrations recorded in three fill soil samples collected from BH7 (0-0.1m), BH107 (0-0.1m) and BH121 (0-0.1m) exceeded the CT1 criterion of 0.8mg/kg.
OCPs & OPPs	30	0	0	Aldrin and dieldrin was recorded in one fill soil sample collected from BH115 (0-0.1m). JKG consider the fill soils should be managed in accordance with the provisions of the Scheduled Chemical Wastes CCO 2004.
PCBs	30	0	0	-
PFOS + PFHxS	6	NSL	0	TCLP analysis for PFOS + PFHxS is required to establish the appropriate waste classification.
PFOA	6	NSL	0	TCLP analysis for PFOA is required to establish the appropriate waste classification.
Asbestos	30	NSL	NSL	Asbestos was identified at the surface and in several fill soil samples. Due to the presence of asbestos, the fill soils are classified as Special Waste (asbestos).

N: Total number (primary samples)

NSL: No set limit

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

Analyte	N	N > TCLP Criteria	Comments
Lead	1	0	The sample with the lead concentration above the CT1 criterion was analysed for TCLP lead. The TCLP lead result was below the TCLP1 criterion.
Benzo(a)pyrene	3	0	The samples with benzo(a)pyrene concentrations above the CT1 criterion were analysed for TCLP benzo(a)pyrene. The TCLP benzo(a)pyrene results were below the TCLP1 criterion.
PFOS + PFHxS	2	0	The samples with positive PFAS results were analysed for TCLP PFOS and PFHxS. The TCLP PFOS and PFHxS results were below the TCLP1 criterion.
PFOA	2	0	The samples with positive PFAS results were analysed for TCLP PFOA. The TCLP PFOS and PFOA results were below the TCLP1 criterion.

N: Total number (primary samples)

7.5 Groundwater Contamination Laboratory Results

The groundwater laboratory results were assessed against the SAC presented in Section 6.2. Individual SAC are shown in the report tables attached in the appendices. A summary of the results is presented below:

Table 7-6: Summary of Groundwater Laboratory Results – Human Health and Environmental (Ecological)

Analyte	N ^	Max. (µg/L)	N> Human Health SAC	N> Ecological SAC	Comments
Arsenic	3	<1	0	0	-
Cadmium	3	<0.1	0	0	-
Chromium (total)	3	<1	0	0	-
Copper	3	2	0	1	A copper concentration above the ecological SAC of 1.3µg/L was recorded in the primary (and field duplicate) groundwater sample collected from MW1.
Lead	3	<1	0	0	-
Mercury	3	<0.05	0	0	-
Nickel	3	13	0	1	A nickel concentration above the ecological SAC of 7µg/L was recorded in the primary groundwater sample collected from MW6.
Zinc	3	71	0	1	A zinc concentration above the ecological SAC of 15µg/L was recorded in the primary groundwater sample collected from MW6.
Total PAHs	3	0.38	0	0	Low concentrations of fluoranthene and pyrene were recorded in the groundwater. No locally derived SAC for pyrene was available.
Benzo(a)pyrene	3	<0.1	0	0	-
Naphthalene	3	<0.2	0	0	-
TRH F1	3	<10	0	NSL	-
TRH F2	3	<50	0	NSL	-
TRH F3	3	<100	NSL	NSL	-
TRH F4	3	<100	NSL	NSL	-
Benzene	3	<1	0	0	-

Analyte	N ^	Max. (µg/L)	N> Human Health SAC	N> Ecological SAC	Comments
Toluene	3	<1	0	0	-
Ethylbenzene	3	<1	0	0	-
m+p-Xylene	3	<2	0	0	-
o-Xylene	3	<1	0	0	-
Total Xylenes	3	<1	0	0	-
VOCs	3	<1	0	0	-
PFOS	3	0.0047	NSL	3	The PFOS concentrations recorded in the groundwater samples were above the ecological SAC of 0.00023µg/L.
PFOS + PFHxS	3	0.0095	0	NSL	-
PFOA	3	0.002	0	0	-
pH	3	5.2 (min) 5.6 (max)	3	3	The pH of the groundwater samples were below the lower threshold for marine waters (pH 7-8.5) and recreational SAC (pH 6.5-8.5).
EC	3	1,400 µS/cm	NSL	NSL	-
Chloride	3	510mg/L	NSL	NSL	-
Sulphate	3	340mg/L	NSL	NSL	-

Notes:

^: Primary samples

N: Total number

NSL: No set limit

NL: Not limiting

7.6 Acid Sulfate Soil Results

The soil laboratory results were assessed against the SAC presented in Section 6.3. The results are presented in the attached report tables and summarised in the following table:

Table 7-7: Summary of ASS Results

Analysis	N	Comments
pH_F and pH_{FOX}	26	The pH_F results ranged from pH 4.3 to pH 8.3. The pH_{FOX} results ranged from pH 3.3 to pH 7.5. The maximum difference from pH_F to pH_{FOX} was 3.4 pH units. None of the pH_F results were pH4 or below and were not AASS.

Analysis	N	Comments
pH_{FOX} reaction rates	26	Reaction rates ranged from low to high. One (1) fill soil sample recorded a high reaction. All remaining reactions were classed as low. The pH_F results, pH_{FOX} results, and reaction rates indicated that some of the soils may contain PASS. Four samples were selected for analysis of ASS characteristics using acid base accounting methods. The samples were selected based on a combination of the pH_F results, pH_{FOX} results, and reaction rates, and to provide spatial coverage and vertical distribution of the soil and bedrock profiles.
Net Acidity % S-equiv.	4	The net acidity results ranged from 0.049%S to 0.14%S. The net acidity (%/S) results exceeded the action criterion in all four soil and rock samples analysed using acid base accounting methods.
Net Acidity mol H^+/t	4	The net acidity results ranged from 31 mol H^+/t to 86 mol H^+/t. The net acidity (mol H^+/t) results exceeded the action criterion in all four soil and rock samples analysed using acid base accounting methods.
S_{CR}%	4	The S_{CR}% results ranged from below or equal to the laboratory PQL of 0.005 S_{CR}%. These results indicated that the soils and rock did not contain significant oxidisable sulfur concentrations.
Liming Rate	4	The liming rate required for neutralisation ranged from 2.3 $kgCaCO_3$/tonne to 6.5 $kgCaCO_3$/tonne.

N: Total number (primary samples)

7.7 Dryland Salinity Results

The laboratory results were assessed against the criteria presented in Section 6.4. The results are presented in the report tables attached in the appendices. A summary of the results is presented in the following table:

Table 7-8: Summary of Salinity Results

Analysis	N	Results
EC & ECe	15	The EC results ranged from 16µS/m to 120µS/m. all Ece results were <2dS/m.
Resistivity	15	Resistivity values were calculated based on the raw EC values. The resistivity values for the soil samples ranged from 8,333ohm.cm to 62,500ohm.cm.
pH	17	The results of the analysis ranged from pH 4.4 to pH 9.9.
CEC	8	The results of the analysis ranged from: • CEC – 7.1 meq/100g to 23meq/100g; • Exchangeable Na – <0.1meq/100g to 0.5meq/100g; • Exchangeable K – 0.1meq/100g to 0.3meq/100g ; • Exchangeable Ca – 0.6meq/100g to 23meq/100g; and • Exchangeable Mg – 0.2meq/100g to 8.9meq/100g.
Sulphate	15	The results ranged from 10mg/kg to 220mg/kg.

Analysis	N	Results
Chloride	15	The results ranged from <10mg/kg to 41mg/kg.
Groundwater	3	The results of the analysis ranged from: • pH – 5.2 to 5.6; • EC – 200µS/cm to 1,400µS/cm; • Chloride - 35mg/L to 340mg/L; and • Sulphate - 27mg/L to 510mg/L.

Note:

Na – Sodium, K – Potassium, Ca – Calcium, Mg – Magnesium

8 PRELIMINARY WASTE CLASSIFICATION ASSESSMENT

8.1 Preliminary Waste Classification of Fill

Based on the results of the waste classification assessment, and at the time of reporting, the fill material is assigned a preliminary classification of **General Solid Waste (non-putrescible) containing Special Waste (asbestos)**. This preliminary classification is due to the confirmed presence of asbestos (bonded and friable) within fill soils in the project area and wider school property. JKG consider there to be potential for additional asbestos-related finds to be identified within the project area boundaries.

JKG note that aldrin and dieldrin was recorded in one fill soil sample at a concentration of 2mg/kg. This is equal to the threshold for classification as scheduled chemical waste in accordance with the Scheduled Chemical Wastes CCO 2004. JKG consider that the fill soils in the vicinity of BH115 should be managed in accordance with the provisions of the Scheduled Chemical Wastes CCO 2004.

Further investigation is required to confirm the waste classification. The further investigation must include a detailed and rigorous assessment for the presence of asbestos in fill soils.

8.2 Preliminary Classification of Natural Soil and Bedrock

The analysis of natural soils within the wider school property was limited to one sample collected from BH107. This sample was analysed for PAHs only, due to elevated concentrations of PAHs recorded in the overlying fill soils. The laboratory results indicated that the PAH impacts were limited to the overlying fill soils.

Based on the site history information, field work observations, and the limited analysis undertaken, JKG is of the opinion that the natural soil and bedrock within the project area will likely meet the definition of **VENM** for off-site disposal or re-use purposes. This classification must be confirmed via additional inspection, sampling and analysis of the natural soils and bedrock following removal of the overlying fill soils.

9 DISCUSSION

9.1 Tier 1 Risk Assessment and Review of CSM

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

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

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

9.1.1 Soil

JKG note that the soil characterisation has predominantly been undertaken on fill soils. The need for testing additional natural soil samples has been identified as a data gap and is discussed further in Section 9.5 of this report. One natural soil sample was analysed for PAHs to assess the potential for vertical migration of PAH impacts from fill to natural soils, discussed in greater detail in Section 9.1.1.2 below.

9.1.1.1 Asbestos

Asbestos was encountered in the form of friable asbestos (i.e. AF/FA) in surficial fill soils in two locations (BH117 and BH120) within the wider school property, and as bonded/non-friable asbestos (i.e. FCF/ACM) in the surficial fill soils in two locations (BH1 and BH118) within the project area, and several other locations within the south of the wider property as shown on Figure 3 attached in Appendix A.

The southern portions of the project area and wider school property (including the proposed drainage lines/trenches) were predominantly unsealed (i.e. grass-covered) at the time of the 2022 site inspection. Given the surficial nature of the impacts, the presence of friable asbestos, and the potential for asbestos fibres to become airborne under day-to-day use, potentially complete SPR linkage exist for current and future receptors, including workers and school children. Remediation and/or management will be required to mitigate these risks.

Based on the identified FCF/ACM and AF/FA encountered, and the sporadic nature of asbestos impacts within fill soils, JKG is of the opinion there is potential for additional asbestos-related finds to be encountered within the boundaries of the project area. On this basis, JKG recommend that an AMP is prepared by a LAA to outline the strategy to mitigate the potential risks to human health posed by asbestos in and on soils.

The JKG 2022 DSI recommended that an emu-pick of the surface of the wider school property was undertaken to collect visible asbestos (i.e. FCF/ACM), and that all areas of exposed soil (including worn vegetation) should be covered with established turf and/or landscape materials in the interim. JKG have been advised by the client that emu-picks of visible FCF/ACM have been undertaken several times and subsequent clearance certificates issued between 2016 and 2024.

JKG recommended that asbestos air monitoring should also be undertaken within the southern portion of the wider school property to assess the potential for airborne asbestos fibres to be encountered during normal use conditions. JKE was advised by the client that daily air monitoring was undertaken by WSP Australia Pty Limited (WSP) on weekdays between 14 October 2024 and 22 October 2024 (i.e. a total of seven days of monitoring), and all results were below 0.01 fibres/mL. These results indicate the concentrations to be within the acceptable range for day-to-day use. However, JKG recommend that use of the southern portion of the school be restricted until the completion of remediation as a precaution to human health. The results are attached in Appendix B.

JKG note that a Site-Specific AMP (SSAMP) for the management of asbestos in grounds was prepared for the site by WSP in 2024[25]. The site is to be managed in the interim in accordance with the requirements of the SSAMP. JKE has recommended that the SSAMP be updated to include mitigation measures for both bonded and friable asbestos in soil.

9.1.1.2 Hydrocarbons

TRH F2 was detected in the surficial fill soil sample collected from BH123 at a concentration above the human health and ecological SAC. The fill soil sample collected from BH123 was subsequently analysed following a silica gel clean-up to remove interference from organic material and polar compounds. The TRH F2 concentrations reported following the silica gel clean-up were also above the human health and ecological SAC. TRH F3 was detected in the shallow fill soil samples collected from BH3 BH4, BH105 and BH106 at concentrations above the ecological SAC. The SAC exceedances are shown on Figure 3 attached in Appendix A.

BH123 was located within a grassed area in the north-east of the project area as shown on Figure 3. As the TRH F2 concentrations were recorded in the surficial fill soils, and this area of the site is unpaved, a complete SPR linkage may be realised for ecological receptors.

From a human health risk perspective, the potential risks are generally associated with vapour intrusion within confined spaces, such as buildings. Though other exposure pathways exist, such as direct contact/ingestion, JKG note that the concentrations were well below the direct contact SAC adopted (refer to Table S3 in Appendix C). Therefore, the relevant exposure pathway for receptors is related to vapour intrusion. As the area is currently unpaved, grassed open area, the TRH F2 is not considered to represent an immediate risk to human health. It is acknowledged however, that temporary buildings are proposed to be installed in this vicinity. There is potential for vapour intrusion to accumulate within and/or beneath these buildings, which may pose an unacceptable risk to future use of the site. Remediation and/or management will be required to manage the potential risks.

BH3 and BH105 were located to the south of the proposed Building R footprint, and BH106 was located in the vicinity of the COLA. These areas were sealed with AC pavement limiting access to the soils, and with the exception of BH106, no vegetation was observed in the immediate vicinity. There was an unsealed area to the east of BH106 which was grass covered, and the grass cover in this area appeared to be adequate. On this basis, the SPR linkages to ecological receptors is generally considered to be incomplete due to broken

[25] WSP, (2024). *Parramatta East Public School Asbestos in Grounds Management Plan* (Project No. PS212906-131, Revision 3, dated 30 September 2024)

exposure pathways and or/ the source (i.e. TRH F3) concentrations not presenting an unacceptable risk, based on site observations. It is noted however, that landscaping is proposed within the vicinity of BH3 and BH105. Once the pavement is removed, a complete SPR linkage may be realised. It is acknowledged that the reported TRH F3 concentrations do not pose an unacceptable risk to human health in the context of the existing development and proposed upgrades.

JKG also note carcinogenic PAHs were recorded in the surficial fill soil sample collected from BH107 at concentrations above the human health SAC. BH107 was located within the north-east of site. The SAC exceedance is shown on Figure 3 attached in Appendix A. The carcinogenic PAH impacts appeared limited to the fill soils, as TCLP analysis was undertaken on the fill soil sample indicated that the carcinogenic PAHs were not leaching. This was also supported by the analysis of the underlying residual soil sample which did not identify concentrations of carcinogenic PAHs above the PQL.

Based on the above, the relevant exposure pathway for receptors to carcinogenic PAH impacts would be direct contact/ingestion. It is noted that no soil disturbance is proposed in the vicinity of BH107. On this basis, the SPR linkage is considered to be incomplete in the context of the proposed upgrades.

Considering the field observations and laboratory results, JKG is of the opinion that the carcinogenic PAHs are associated with slag inclusions within historically imported fill, and are likely to be contained within a bound matrix (i.e. slag). On this basis, the carcinogenic PAHs are considered unlikely to represent an immediate risk to human health within the school property during the current and future use. However, further investigation should be undertaken to confirm and additional testing is recommended for this CoPC during upgrade works.

9.1.1.3 Pesticides

A total aldrin and dieldrin (OCP) concentration of approximately 35% of the human health SAC was recorded in the surficial fill soil sample collected from BH115. This concentration was equal to the threshold for scheduled chemical wastes in accordance with the Scheduled Chemical Wastes CCO 2004.

BH115 was located in within the footprint of the proposed waste room and stormwater treatment area in the south-east of the site, and therefore soil disturbance is proposed. Though the concentration is not considered to pose an unacceptable risk to human health, JKG is of the opinion that the fill soils in the vicinity of BH115 should be managed in accordance with the provisions of the Scheduled Chemical Wastes CCO 2004. Further, given the lack of OCP detected within the soil samples, the broad spacing of sampling locations, and that statistical analysis was not undertaken, JKG is of the opinion that further investigation of OCPs in soil in the vicinity of BH115 is warranted.

9.1.1.4 Other CoPC in Soil

All remaining CoPC in soil were below the relevant SAC.

9.1.2 Groundwater

9.1.2.1 PFAS

PFOS was detected in the groundwater at concentrations above the ecological SAC. The SAC exceedances are shown on Figure 3 attached in Appendix A. All other PFAS results were below the respective SAC.

JKG note that concentrations of PFOS were detected within fill soil samples analysed for PFAS. The concentrations ranged from the laboratory PQL to 5.7µg/kg and were generally considered to be low. No point sources of PFAS contamination were identified on site, indicating that the fill soils were unlikely to be the primary source of PFAS within the groundwater. Trace concentrations of PFOS are common in urban groundwater settings, and therefore was considered likely to be a regional issue.

Based on the above, and the proposed upgrades, JKG is of the opinion that there is a low potential for the PFOS in groundwater to represent an unacceptable risk to receptors in the context of the proposed activity.

9.1.2.2 Heavy Metals

Copper, nickel, and/or zinc were detected in the groundwater samples collected from MW1 and MW6 at concentrations above the ecological SACs. The SAC exceedances are shown on Figure 3 attached in Appendix A.

Review of the soil results indicate that the heavy metal concentrations were relatively consistent between BH1 and BH3 and were generally low. No soil samples were analysed from BH6. Elevated nickel and zinc concentrations were recorded in the fill soils in some locations inferred up-gradient (or general vicinity) of MW1 and MW6, though no deeper soil analysis was undertaken to assess the potential for heavy metals to migrate from the soil to the groundwater. However, it is noted that JKG is of the opinion that the heavy metal impacts in soil were associated with imported fill and were likely contained to the fill soils, considering the results of limited TCLP analysis undertaken on selected fill soil samples.

Considering the above, and the urban setting of the wider site, JKG considered that the heavy metals were likely a regional issue and were unlikely to pose an unacceptable risk to receptors in the context of the proposed activity.

9.1.2.3 Hydrocarbons

Trace concentrations of fluoranthene and pyrene were detected in the groundwater samples. The concentrations were equal to or marginally above the respective PQLs and were below the fluoranthene ecological SAC. No locally derived SAC were available for pyrene, or recreational SAC for fluoranthene.

Considering the above, and the urban setting of the wider site, and the results of TCLP PAH analysis of fill soils and the PAH results of the natural soil sample, JKG considered that the PAHs were likely a regional issue and were unlikely to pose an unacceptable risk to receptors in the context of the proposed activity. However, further investigation is recommended to confirm this opinion.

9.1.2.4 Physical Parameters

The pH of the groundwater was below the lower threshold of the ecological and recreational SACs. The SAC exceedances are shown on Figure 3 attached in Appendix A.

The pH was considered likely to be a regional issue and was considered unlikely to pose an unacceptable risk to receptors in the context of the proposed activity.

9.1.2.5 Other CoPC in Groundwater

All remaining CoPC in groundwater were below the respective SAC.

9.2 Acid Sulfate Soil Discussion

Based on the weight of evidence collected and evaluated, ASS (AASS or PASS) conditions that would be expected to pose a risk to the environment if disturbed during the proposed upgrades described in Section 1.2 have not been identified. This conclusion is supported by the following:

- ASS risk mapping information presented in the PSI indicated that the site is not located within a risk area;
- The geological information presented in the PSI indicated that the site is underlain by Ashfield Shale of the Wianamatta Group, which typically consists of black to dark grey shale and laminite. The investigation identified fill soils overlying shallow residual soils and bedrock. ASS are not usually associated with residual soil profiles;
- The site is located at an elevation of approximately 16-25mAHD, with excavations to a maximum depth of 3mBGL (i.e. 13-22mAHD). ASS are not usually associated with soil horizons above 5mAHD; and
- Though the results of the field tests and other laboratory results identified acidic conditions greater than the action criteria, these results are considered to be indicative of acid soils associated with organic/humic material rather than ASS materials as significant concentrations of oxidisable sulfur, demonstrated by the low SCR% results, were not encountered in the samples.

Based on the above, an ASSMP is not considered necessary for the proposed activity.

9.3 Dryland Salinity Discussion

Interpretation of the results against the SAC is provided in the following table.

Table 9-1: Interpretation of Laboratory Results

Parameter	Notes
Soil Salinity and Plant Growth	The ECe results were all <2dS/m and were classed as non-saline.
Soil pH and Plant Growth	The soil pH results ranged from pH 4.4 to 9.9, and are classed as extremely acidic to very strongly alkaline. The shallow fill soils were generally within the optimum range for plant growth. The gravelly fill soils were within the very strongly alkaline rating. The residual silty clay soils and underlying sandstone bedrock were generally within the very strongly acidic to optimum range for plant growth ratings.

Parameter	Notes
CEC in Soil	The CEC values ranged from 7.1meq/100g to 23meq/100g in the low to moderate range. The majority of the samples were within the low range which is typical of the soil formation encountered at the site and are generally indicative of the low levels of organic matter within the soils.
Ratio of Calcium to Magnesium	The results indicate that the residual soils have more magnesium than calcium, and the fill soils have more calcium than magnesium. The CEC of the soil is generally low. Lime and gypsum can be used to stabilise the soil which will improve soil structure for both engineering and fertility purposes.
ESP%	The ESP% values of the samples ranged from 0.4% to 6%. The majority of the ESP results were below the 5% threshold and were classed as non-sodic.
Groundwater Salinity	The laboratory results indicate that the groundwater is generally fresh to marginal and within the 'marginal river water' water type.
Concrete Slabs and Footings in Saline Soils (CCAA 2018)	The proposed earthworks are anticipated to expose soils and bedrock classed as non-saline. The CCAA 2018 recommended concrete grade for slabs and footings in non-saline soils is N20. The results should be assessed by the project design team as applicable for the proposed activity. Reference should also be made to AS2159-2009 for minimum concrete strengths and reinforcement cover for concrete piles/foundations.
Soil Conditions for Exposure Classification (AS2159-2009)	The boreholes drilled for the investigation have indicated that the subsurface conditions at the site generally comprise of low permeability soils (i.e. silts and clays). Based on this, the exposure classification outlined under 'Soil Conditions B' has been adopted for the assessment.
Exposure Classification for Concrete Piles/Foundations (AS2159-2009)	The soil pH and sulphate results indicate that the soils are mildly to moderately aggressive towards buried concrete. The groundwater pH, sulphate and chloride results indicate that the groundwater is mildly aggressive towards buried concrete. The results should be assessed by the project design team as applicable for the proposed activity.
Exposure Classification for Steel Piles/Foundations (AS2159-2009)	The soil resistivity, pH and chloride results indicate that the soils are non-aggressive towards buried steel. The groundwater pH and chloride results indicate that the groundwater is non-aggressive towards buried steel. The results should be assessed by the project design team as applicable for the proposed activity.

9.4 Decision Statements

The decision statements are addressed below:

Are any results above the SAC?

Yes, as discussed in Section 7.

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

Asbestos (in the form of FCF/ACM), TRH F2 and TRH F3 have been identified within shallow fill soils which pose a potential risk to human health and ecological receptors. There is also potential for additional asbestos-related finds (in bonded/non-friable and friable forms) and carcinogenic PAHs to be encountered within the fill soils within the project area.

Is remediation required?

Yes. Remediation is required to address the risks posed to human health by asbestos and TRH (identified on-site), carcinogenic PAHs and additional asbestos-related finds identified in the shallow fill soils, and the risks posed to ecological receptors by TRH and zinc in the shallow fill soils. Remediation of groundwater is not proposed at this stage.

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

JKG is of the opinion that the project area can be made suitable for the proposed activity by remediation. A RAP is to be prepared and implemented to address the identified contamination. An AMP must also be prepared for the remediation works.

Is an ASSMP required?

Based on the available data, an ASSMP is not required for the proposed activity within the project area boundaries.

Is an SMP required?

Based on the available data, a SMP is not required for the proposed activity within the project area boundaries. The results of the dryland salinity investigation should be reviewed by the design team to address potential aggressive conditions associated with the foundations and built structures.

9.5 Data Gaps

An assessment of data gaps is provided in the following table:

Table 9-2: Data Gap Assessment

Data Gap	Assessment
Groundwater assessment limited in scope.	The groundwater SWLs were calculated based on the surface levels of the monitoring wells to establish an inferred groundwater flow direction. The surface levels of the monitoring wells were interpolated by JKG from spot heights and contours on the provided survey plan, discussed further in the JKG geotechnical report. This method is considered acceptable to provide an inferred flow direction, though the SWLs should be confirmed via a survey of the installed groundwater monitoring wells.

Data Gap	Assessment
	Based on the site history, the results reported, and the proposed activity details, the potential for groundwater contamination to pose an unacceptable risk to the receptors is considered to be low. However, it is noted that detectable concentrations of PAHs were recorded in the groundwater samples. Additional sampling and analysis must be undertaken to confirm the groundwater contamination conditions to confirm the assumptions made for this DSI. This can be address within the RAP framework.
Soil sampling density below minimum guideline density.	It is acknowledged that where a site is known to be impacted by asbestos, the WA DoH (2021) guidance recommends that asbestos quantification sampling should be conducted at twice the recommended minimum sampling density. As asbestos has been identified within and in close proximity to the site, JKG is of the opinion that the asbestos quantification sampling should be conducted at twice the minimum recommended sampling density. The RAP must include provisions for additional soil sampling to address this data gap.
Building footprints not assessed.	The sampling locations were positioned outside of the building footprints. The fill and soil conditions beneath the building footprints are currently unknown. The RAP must include provisions for additional soil sampling beneath the building footprints to address this data gap. It is acknowledged that investigation beneath the buildings is not feasible until demolition occurs.
Residual soils not assessed.	The soil sampling for contamination was targeted to the shallow fill soils. One natural soil sample was analysed for PAHs for the purpose of assessing vertical migration of PAHs from the overlying fill soils. No other CoPC were analysed in the natural soil samples, therefore the soil conditions are currently unknown. The RAP must include provisions for additional soil sampling, including analysis of natural soil samples. JKG note this will also be required to confirm the waste classification of the natural soils.
OCP impacts not well-defined.	The investigation identified a total aldrin and dieldrin (OCP) concentration of approximately 35% of the SAC in one shallow fill soil sample. The concentration was also equal to the threshold for classification as scheduled chemical waste in accordance with the Scheduled Chemical Wastes CCO 2004. Given the lack of other OCP detections, the spacing of the samples and that statistical analysis was not undertaken, further investigation of OCPs in the vicinity of BH115 is warranted. The RAP must include provisions for additional soil sampling to address this data gap.
Waste classification of soils not confirmed.	Preliminary waste classifications were provided in Section 8 of this report. Additional sampling and testing are required to confirm the classifications, and is to include rigorous and detailed assessment for the presence of asbestos in fill soils. The RAP must include provisions for additional soil sampling to address this data gap.

10 CONCLUSIONS AND RECOMMENDATIONS

The investigation included a review of historical information, soil and groundwater data, and ASS and dryland salinity information presented in the JKG 2022 DSI. This information was reviewed in the context of the proposed activity within the project area boundaries.

The investigation identified fill soils impacted by asbestos and TRH at concentrations that trigger the need for remediation. The investigation also identified a potential for additional asbestos-related finds (in the form of bonded/non-friable and friable asbestos) and carcinogenic PAHs to be encountered within the fill soils. Further investigation of the groundwater conditions is also warranted.

Based on the findings of the investigation, JKG is of the opinion that the project area can be made suitable for the proposed activity described in Section 1.2, via remediation. The following is included as mitigation measures:

- Prepare an AMP to outline the management strategy for addressing the potential risks posed by asbestos. This must be prepared by an LAA;
- Prepare a RAP to address the contamination issues identified within the site and to provide a framework to address the data gaps outline in Section 9.5 following demolition and prior to proceeding with remediation;
- Interim management of the asbestos in grounds in accordance with the WSP (2024) SSAMP and any updates to incorporate mitigation measures associated with friable asbestos; and
- Prepare a validation assessment report documenting the remediation works undertaken at the project area.

At this stage, JKG consider that there is no requirement to notify the NSW EPA under the Duty to Report Contamination within the bounds of the project area, provided the recommendations in this report are implemented. The duty to report is to be reassessed following remediation.

The investigation also assessed the potential for ASS to be disturbed during the upgrade works, and the dryland salinity conditions at the site. The investigation concluded that PASS and AASS conditions that that would be expected to pose a risk to the environment if disturbed during the proposed activity were not identified. JKG is of the opinion that an ASSMP is not required for the proposed activity.

The investigation identified that the soils and rock at the site are classed as non-saline and non-aggressive towards buried steel. The soils and rock at the site are moderately aggressive to buried concrete. The groundwater beneath the site is mildly aggressive to buried concrete and non-aggressive to buried steel. Based on the investigation, JKG is of the opinion that an SMP is not required for the proposed activity. However, the salinity results should be considered by the design team to address potential aggressive conditions associated with the foundations and built structures.

JKG consider that the report objectives outlined in Section 1.6 have been addressed.

10.1 Mitigation Measures

Table 10-1: Mitigation Measures

Project Stage Design (D) Construction (C) Operation (O)	Mitigation Measure	Reason for Mitigation Measure
C	The project area is to be remediated in accordance with the RAP[26] prepared by JKG. The remediation strategy includes a combination of excavation and off-site disposal of contaminated soil, and on-site containment. It is noted that the RAP includes a data gap investigation process, which will also inform the extent of remediation required. A site validation report should be prepared documenting the remediation works. All remediation work shall be carried out in accordance with the guidelines made or approved under Section 105 of the CLM Act 1997.	To reduce the risks posed to human health and the environment to an acceptable level and ensuring that the site is suitable for ongoing use as a primary school.
C	The remediation and construction works are to be managed in accordance with the Construction Phase AMP[27] prepared by JKG.	To reduce the risks posed by asbestos to human health during remediation and construction-related activities.
O	The site is to be managed in accordance with an operational AMP, should asbestos remain at the site (i.e. in/on soils and/or in structures) and any long-term Environmental Management Plan (EMP) if other CoPC are capped as part of the remediation works.	To manage the potential risks posed by asbestos and other CoPC to human health during the day-to-day use of the site.
D and C	Soil and groundwater aggression conditions to be incorporated into design and construction.	To account for the aggressive conditions encountered during the dryland salinity investigation.

[26] JKG, (2025a). *Report to NSW Department of Education on Remediation Action Plan for Parramatta East Public School (PEPS) Upgrade, Brabyn Street, North Parramatta, NSW*. (Ref: E35073BR2rpt3.Rev3-RAP)

[27] JKG, (2025b). *Report to NSW Department of Education on Construction Phase Asbestos Management Plan (AMP) for Parramatta East Public School (PEPS) Upgrade, Brabyn Street, North Parramatta, NSW.* (Ref: E35073BR2rpt2.Rev4-AMP)

11 LIMITATIONS

The report limitations are outlined below:

- JKG 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 JKG proposal; and terms of contract between JKG 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, JKG has not undertaken any verification process, except where specifically stated in the report;
- JKG 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;
- JKG 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;
- JKG 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 land use. JKG 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 JKG 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 JKG 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.

JKG 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 JKG 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 report.

Title: **SITE LOCATION PLAN**

Location: PARRAMATTA EAST PUBLIC SCHOOL, NORTH PARRAMATTA, NSW

Report No: E35073BR2

Figure No: 1

JKGeotechnics

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LEGEND

APPROXIMATE PROJECT AREA BOUNDARY	
APPROXIMATE OUTLINE OF WIDER SCHOOL BOUNDARY	
FCF(Surface)	FIBRE CEMENT FRAGMENT LOCATION, NUMBER AND DEPTH (Surface/m)
BH(Fill Depth)	BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m)
BH/MW(Fill Depth)	BOREHOLE AND GROUNDWATER MONITORING WELL LOCATION, NUMBER AND DEPTH OF FILL (m)

0 10 20 30 40 50

SCALE 1:1000 @A3 METRES

This plan should be read in conjunction with the report.

Title: **SAMPLE LOCATION PLAN**

Location: PARRAMATTA EAST PUBLIC SCHOOL, NORTH PARRAMATTA, NSW

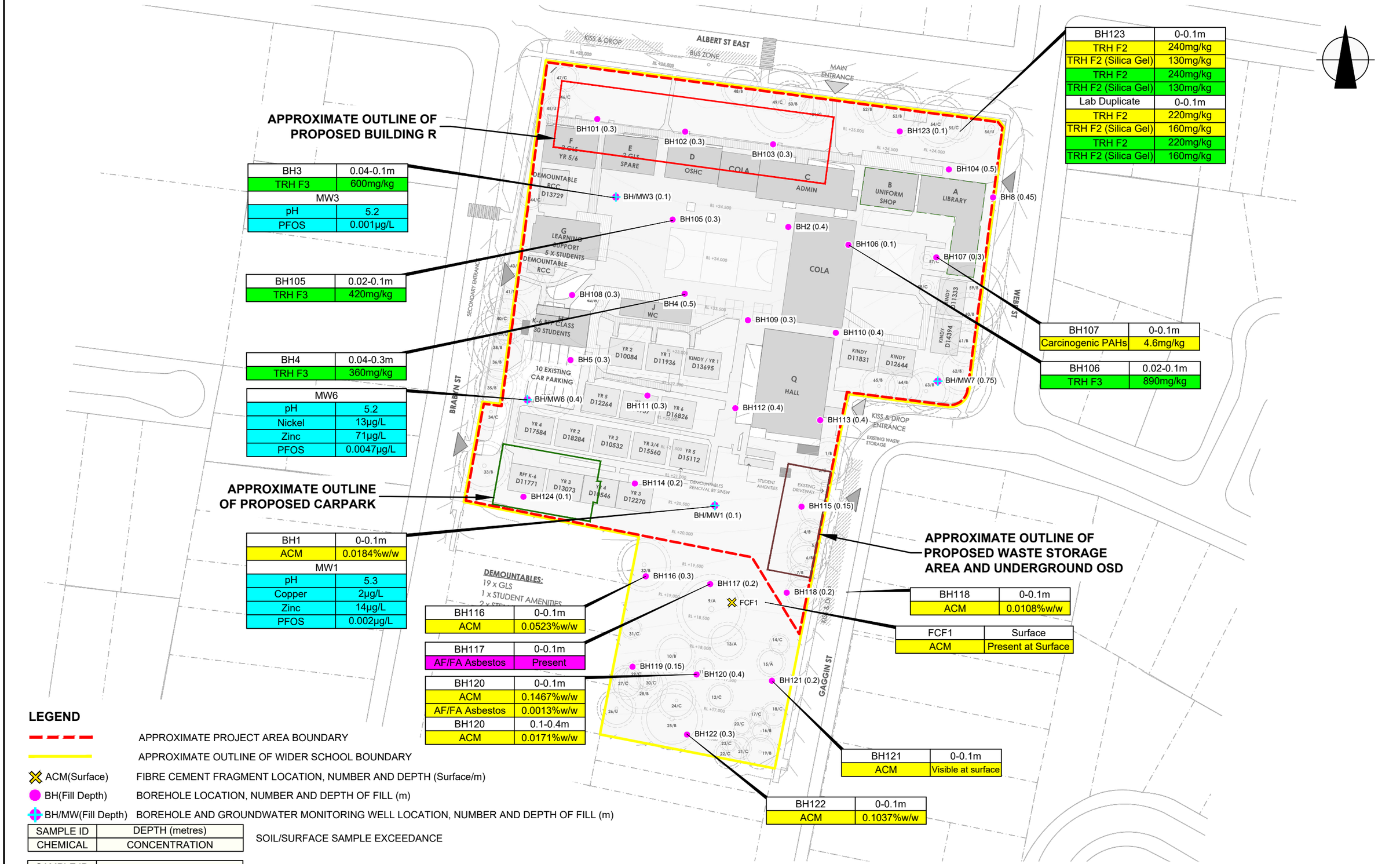
Report No: E35073BR2

Figure No: 2

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APPROXIMATE OUTLINE OF PROPOSED BUILDING R

BH3	0.04-0.1m
TRH F3	600mg/kg
MW3	
pH	5.2
PFOS	0.001µg/L

BH105	0.02-0.1m
TRH F3	420mg/kg

BH4	0.04-0.3m
TRH F3	360mg/kg

MW6	
pH	5.2
Nickel	13µg/L
Zinc	71µg/L
PFOS	0.0047µg/L

APPROXIMATE OUTLINE OF PROPOSED CARPARK

BH1	0-0.1m
ACM	0.0184%w/w
MW1	
pH	5.3
Copper	2µg/L
Zinc	14µg/L
PFOS	0.002µg/L

BH116	0-0.1m
ACM	0.0523%w/w

BH117	0-0.1m
AF/FA Asbestos	Present

BH120	0-0.1m
ACM	0.1467%w/w
AF/FA Asbestos	0.0013%w/w
BH120	0.1-0.4m
ACM	0.0171%w/w

BH123	0-0.1m
TRH F2	240mg/kg
TRH F2 (Silica Gel)	130mg/kg
TRH F2	240mg/kg
TRH F2 (Silica Gel)	130mg/kg
Lab Duplicate	0-0.1m
TRH F2	220mg/kg
TRH F2 (Silica Gel)	160mg/kg
TRH F2	220mg/kg
TRH F2 (Silica Gel)	160mg/kg

BH107	0-0.1m
Carcinogenic PAHs	4.6mg/kg

BH106	0.02-0.1m
TRH F3	890mg/kg

APPROXIMATE OUTLINE OF PROPOSED WASTE STORAGE AREA AND UNDERGROUND OSD

BH118	0-0.1m
ACM	0.0108%w/w

FCF1	Surface
ACM	Present at Surface

BH121	0-0.1m
ACM	Visible at surface

BH122	0-0.1m
ACM	0.1037%w/w

LEGEND

- APPROXIMATE PROJECT AREA BOUNDARY
- APPROXIMATE OUTLINE OF WIDER SCHOOL BOUNDARY
- ACM(Surface) — FIBRE CEMENT FRAGMENT LOCATION, NUMBER AND DEPTH (Surface/m)
- BH(Fill Depth) — BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m)
- BH/MW(Fill Depth) — BOREHOLE AND GROUNDWATER MONITORING WELL LOCATION, NUMBER AND DEPTH OF FILL (m)

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/SURFACE CONTAMINATION ABOVE SAC FOR ECOLOGICAL RISK
- GROUNDWATER CONTAMINATION ABOVE SAC
- ASBESTOS DETECTED

0 10 20 30 40 50
SCALE 1:1000 @A3 METRES

This plan should be read in conjunction with the report.

Title: **SAC EXCEEDANCES PLAN**

Location: PARRAMATTA EAST PUBLIC SCHOOL, NORTH PARRAMATTA, NSW

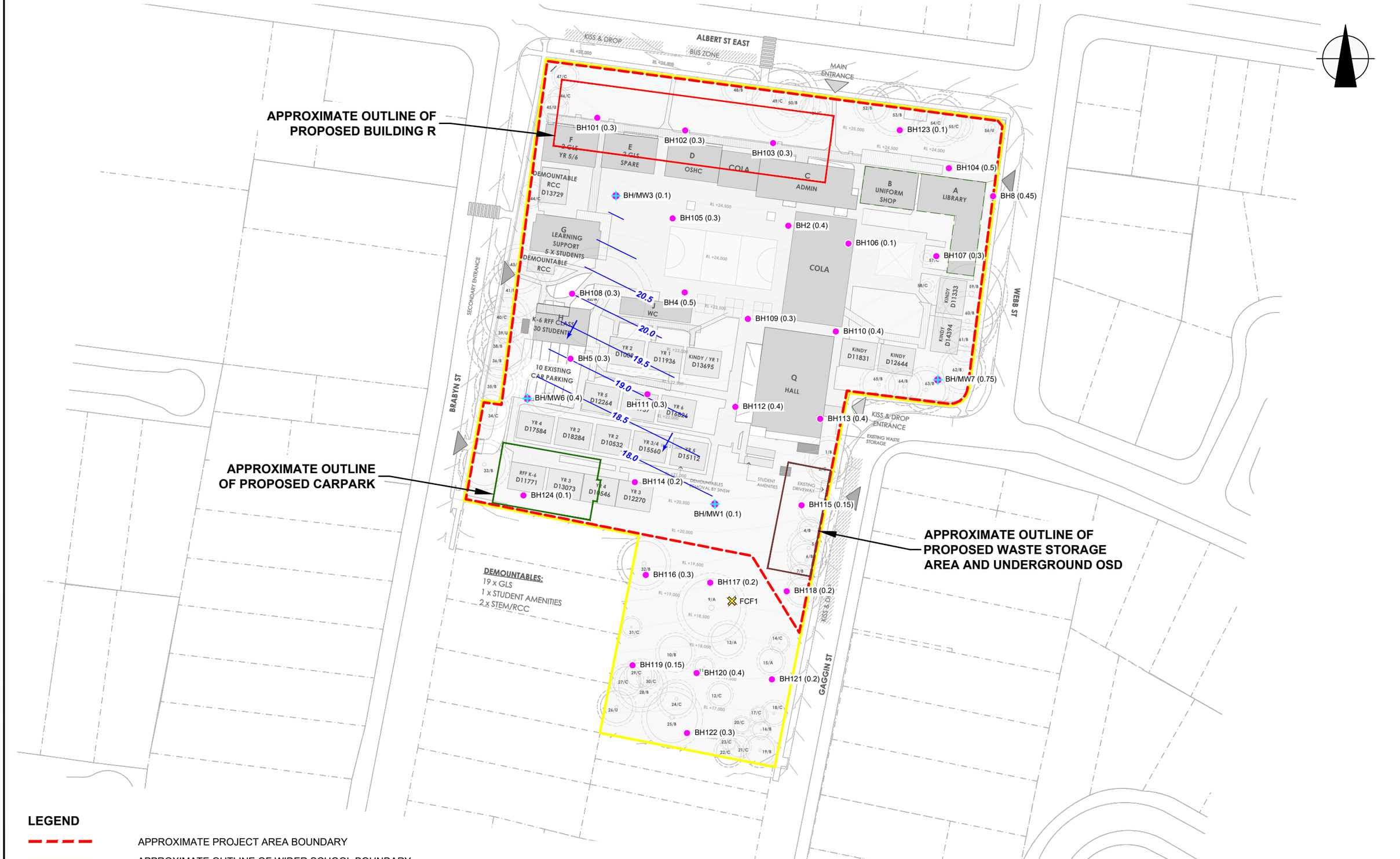
Report No: E35073BR2

Figure No: 3

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LEGEND

APPROXIMATE PROJECT AREA BOUNDARY	
APPROXIMATE OUTLINE OF WIDER SCHOOL BOUNDARY	
FCF(Surface)	FIBRE CEMENT FRAGMENT LOCATION, NUMBER AND DEPTH (Surface/m)
BH(Fill Depth)	BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m)
BH/MW(Fill Depth)	BOREHOLE AND GROUNDWATER MONITORING WELL LOCATION, NUMBER AND DEPTH OF FILL (m)
18.5	GROUNDWATER CONTOUR INTERVALS (m)
	INFERRED GROUNDWATER FLOW DIRECTION

0 10 20 30 40 50

SCALE 1:1000 @A3 METRES

This plan should be read in conjunction with the report.

Title: **INFERRED GROUNDWATER CONTOUR PLAN**

Location: PARRAMATTA EAST PUBLIC SCHOOL, NORTH PARRAMATTA, NSW

Report No: E35073BR2

Figure No: 4

JKGeotechnics

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Appendix B: Site Information and Site History

Selected Project Plans



JDH ARCHITECTS.
Suite 301/249 Pitt Street
Sydney NSW 2000
Telephone: 02 9281 8697
www.jdharchitects.com.au

LEGEND

- EXISTING BUILDING/STRUCTURE
- PROPOSED BUILDING
- REFURBISHMENT
- DEMOUNTABLE
- TO BE DEMOLISHED/REMOVED
- EXISTING AWNING/ COVERED WALKWAY
- PROPOSED AWNING/ COVERED WALKWAY
- GARDEN
- TURF
- EXISTING WALKWAY
- PROPOSED WALKWAY
- KISS AND DROP AREA
- WOMBAT CROSSING
- VEHICLE ENTRY POINT
- PEDESTRIAN ENTRY POINT
- SITE BOUNDARY
- METAL FENCE
- EXISTING TREE TO BE RETAINED (NUMBER & CATEGORY. REFER TO ARBORIST)
- EXISTING TREE TO BE DEMOLISHED
- PROPOSED TREE
- TREE PROTECTION ZONE
- STRUCTURAL ROOT ZONE

MECHANICAL ENGINEER	STEENSEN VARMING
HYDRAULIC / FIRE ENGINEER	erbas
ELECTRICAL ENGINEER	STEENSEN VARMING
CIVIL ENGINEER	Woolacotts.
STRUCTURAL ENGINEER	Woolacotts.
ESD	STEENSEN VARMING
CLIENT	NSW GOVERNMENT

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REV	DESCRIPTION	DATE	INIT.
K	SD 90% ISSUED FOR INFORMATION	6/09/2024	FT/ KS
J	SD 87% ISSUED FOR INFORMATION	21/08/2024	FT/ KS
I	SD 85% ISSUED FOR INFORMATION	9/08/2024	FT/ KS
H	SD 80% ISSUED FOR INFORMATION	22/07/2024	FT/ KS
G	SD 70% ISSUED FOR INFORMATION	17/07/2024	KS
F	SD 55% ISSUED FOR INFORMATION	9/07/2024	KS

AMENDMENTS

PROJECT:
PARRAMATTA EAST PUBLIC SCHOOL
CLIENT:
SINSW
ADDRESS:
BRABYN STREET PARRAMATTA NSW 2150 AUS

DRAWING:
SITE PLAN EXISTING

N

PROJECT PHASE:	SCALE:	DESIGNED/DRAWN:	CHECKED:	SHEET SIZE:
SD	1:500	KS/FT	JT	A1

JOB NO:	SHEET NO:	REVISION:
1291	PEPS-JDH-ZZ-XX-DR-A-0010	**K**

ISSUED ON: 6/09/2024 3:31 PM
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JDH ARCHITECTS.
Suite 301/249 Pitt Street
Sydney NSW 2000
Telephone: 02 9281 8697
www.jdharchitects.com.au

LEGEND

- EXISTING BUILDING/STRUCTURE
- PROPOSED BUILDING
- REFURBISHMENT WORKS
- DEMOUNTABLE
- TO BE DEMOLISHED/REMOVED
- EXISTING AWNING/ COVERED WALKWAY
- PROPOSED AWNING/ COVERED WALKWAY
- PROPOSED SOFT SOIL
- EXISTING SOFT SOIL
- EXISTING WALKWAY
- PROPOSED FOOTPATH
- EXISTING KISS AND DROP AREA
- PROPOSED KISS AND DROP AREA
- CUT/FILL
- RAISED CROSSING
- VEHICLE ENTRY POINT
- PEDESTRIAN ENTRY POINT
- SITE BOUNDARY
- METAL FENCE
- EXISTING TREE TO BE RETAINED (NUMBER & CATEGORY REFER TO ARBORIST)
- EXISTING TREE TO BE DEMOLISHED UNDER EXEMPT DEVELOPMENT
- PROPOSED TREE
- TREE PROTECTION ZONE
- STRUCTURAL ROOT ZONE

MECHANICAL ENGINEER	STEENSEN VARMING
HYDRAULIC / FIRE ENGINEER	erbas
ELECTRICAL ENGINEER	STEENSEN VARMING
CIVIL ENGINEER	Woolacotts.
STRUCTURAL ENGINEER	Woolacotts.
ESD	STEENSEN VARMING
CLIENT	NSW GOVERNMENT

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REV	DESCRIPTION	DATE	INIT.
A	TD 100% ISSUED FOR TENDER	28/11/2024	KS

AMENDMENTS

PROJECT:
PARRAMATTA EAST PUBLIC SCHOOL
CLIENT:
SINSW
ADDRESS:
BRABYN STREET PARRAMATTA NSW 2150 AUS

DRAWING:
SITE PLAN PROPOSED

PROJECT PHASE:	SCALE:	DESIGNED/DRAWN:	CHECKED:	SHEET SIZE:
P5 - TENDER	1:500	KS/FT	JT	A1

JOB NO:	SHEET NO:	REVISION:
1291	PEPS-JDH-ZZ-XX-DR-A-0012	**A**



TOTAL PROPOSED PLAY SPACE AREA: 8,572.85m²

JDH ARCHITECTS.
Suite 301/249 Pitt Street
Sydney NSW 2000
Telephone: 02 9281 8697
www.jdharchitects.com.au

MECHANICAL ENGINEER: STEENSEN VARMING
HYDRAULIC / FIRE ENGINEER: erbas
ELECTRICAL ENGINEER: STEENSEN VARMING
CIVIL ENGINEER: Woolacotts.
STRUCTURAL ENGINEER: Woolacotts.
ESD: STEENSEN VARMING
CLIENT: NSW GOVERNMENT

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REV	DESCRIPTION	DATE	INIT.
A	SD 90% ISSUED FOR INFORMATION	6/09/2024	FT/ KS

AMENDMENTS

PROJECT:
PARRAMATTA EAST PUBLIC SCHOOL
CLIENT:
SINSW
ADDRESS:
BRABYN STREET PARRAMATTA NSW 2150 AUS

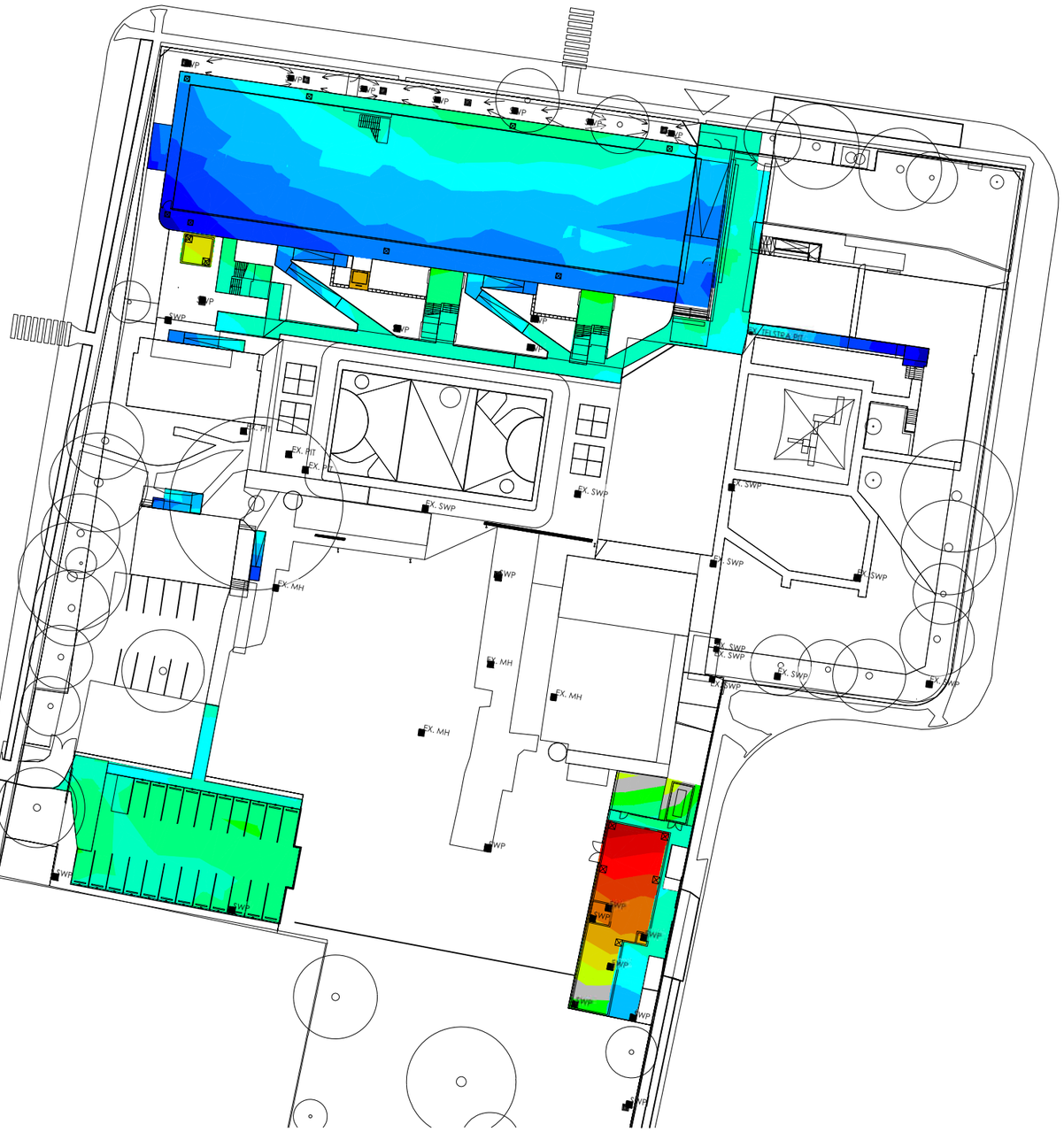
DRAWING:
PROPOSED PLAY SPACE AREA

N

PROJECT PHASE:	SCALE:	DESIGNED/DRAWN:	CHECKED:	SHEET SIZE:
SD	1:400	KS/FT	JT	A1

JOB NO: 1291 | SHEET NO: PEPS-JDH-ZZ-ZZ-DR-A-0014 | REVISION: A

ISSUED ON 6/09/2024 3:31 PM
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Levels Table			
No.	Min. Level	Max. Level	Colour
1	-3.000	-2.800	
2	-2.800	-2.600	
3	-2.600	-2.400	
4	-2.400	-2.200	
5	-2.200	-2.000	
6	-2.000	-1.800	
7	-1.800	-1.600	
8	-1.600	-1.400	
9	-1.400	-1.200	
10	-1.200	-1.000	
11	-1.000	-0.800	
12	-0.800	-0.600	
13	-0.600	-0.400	
14	-0.400	-0.200	
15	-0.200	0.000	
16	0.000	0.200	
17	0.200	0.400	
18	0.400	0.600	
19	0.600	0.800	
20	0.800	1.000	

CUT AND FILL SUMMARY

CUT FACTOR	FILL FACTOR	CUT VOLUME	FILL VOLUME	NET VOLUME
1.1	1.0	1164.37m³	348.60m³	815.77m³ (CUT)

No.	Date	Description	Ver.	Appr.
P1	02.10.24	100% SCHEMATIC DESIGN RE-ISSUE		
P2	04.11.24	100% SCHEMATIC DESIGN RE-ISSUE		

NOT FOR CONSTRUCTION

Architect
JDH ARCHITECTS
SUIT 301/249 PITT STREET
SYDNEY NSW 2000

Woolacotts. CONSULTING ENGINEERS
T +61 2 8203 1500 I www.woolacotts.com.au
Suite 6.02 Level 6, 67 Albert Ave, Chatswood NSW 2067
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PARRAMATTA EAST PUBLIC SCHOOL
BRABYN STREET, PARRAMATTA
NSW 2150

CUT AND FILL PLAN

Date	Approved	Verified	Prepared
OCTOBER 2024			
Scale @ A1: 1:400			

Job number	Drawing number	Amendment
22-107	PEPS-WCE-00-00-DR-C-0401	P2

JKG 2022 DSI Figures



AERIAL IMAGE SOURCE: MAPS.AU.NEARMAP.COM

This plan should be read in conjunction with the report.

Title: **SITE LOCATION PLAN**

Location: PARRAMATTA EAST PUBLIC SCHOOL, PARRAMATTA, NSW

Report No: E35073B

Figure No: 1

JKGeotechnics

PLOT DATE: 11/07/2022 1:47:07 PM DWG FILE: S:\5 EIS\5C EIS JOBS\35000\E35073B PARRAMATTA\CAD\E35073B.DWG

© JK GEOTECHNICS



LEGEND

APPROXIMATE SITE BOUNDARY	
FCF(Surface)	FIBRE CEMENT FRAGMENT LOCATION, NUMBER AND DEPTH (Surface/m)
BH(Fill Depth)	BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m)
BH/MW(Fill Depth)	BOREHOLE AND GROUNDWATER MONITORING WELL LOCATION, NUMBER AND DEPTH OF FILL (m)

AERIAL IMAGE SOURCE: MAPS.AU.NEARMAP.COM

0 10 20 30 40 50

SCALE 1:1000 @A3 METRES

This plan should be read in conjunction with the report.

Title: **SAMPLE LOCATION PLAN**

Location: PARRAMATTA EAST PUBLIC SCHOOL, PARRAMATTA, NSW

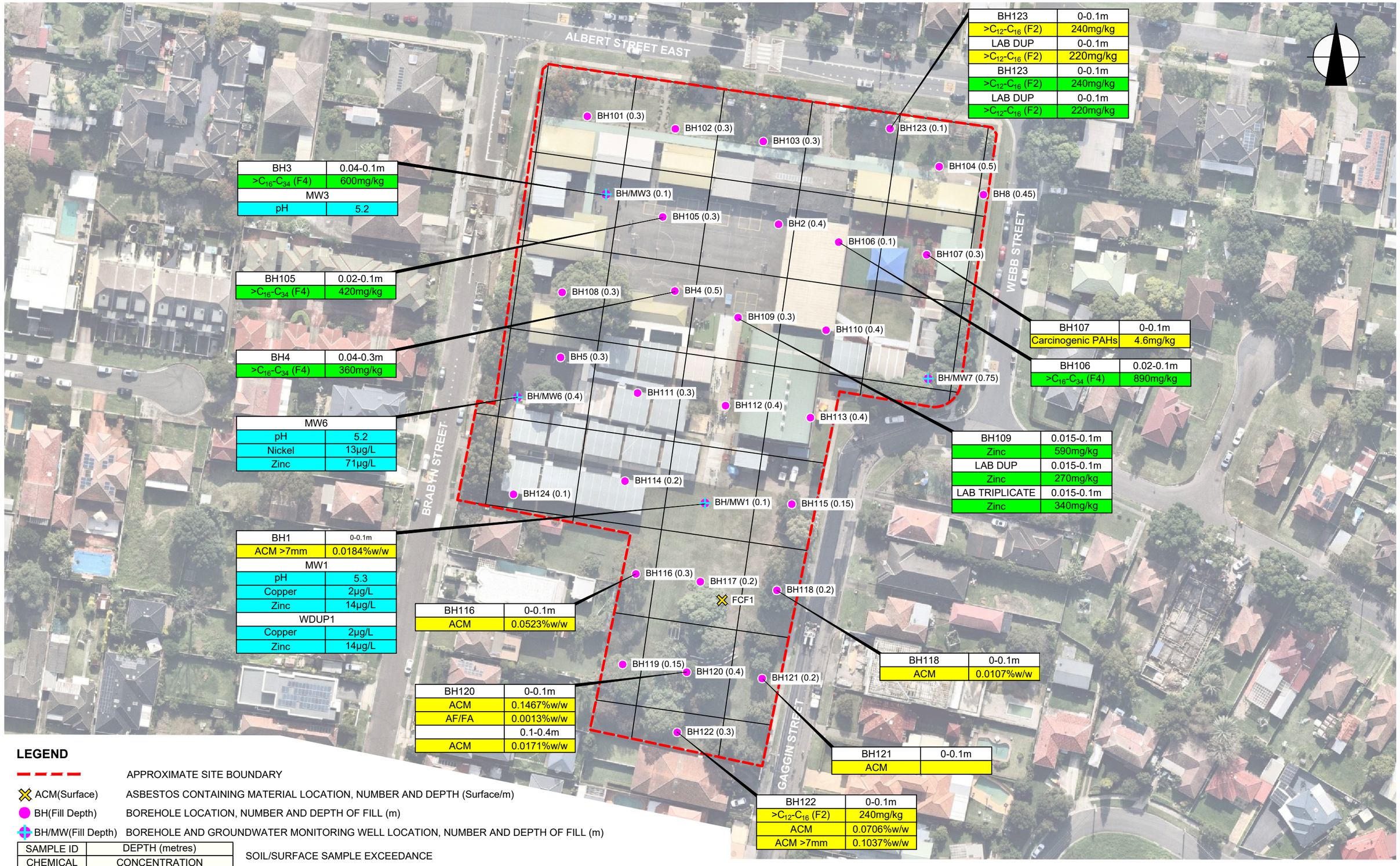
Report No: E35073B

Figure No: 2

JKGeotechnics

PLOT DATE: 22/08/2022 12:19:09 PM DWG FILE: K:\5C EIS JOBS\35000'S\E35073B PARRAMATTA\CADE35073B.DWG

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LEGEND

- APPROXIMATE SITE BOUNDARY
- ACM(Surface) — ASBESTOS CONTAINING MATERIAL LOCATION, NUMBER AND DEPTH (Surface/m)
- BH(Fill Depth) — BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m)
- BH/MW(Fill Depth) — BOREHOLE AND GROUNDWATER MONITORING WELL LOCATION, NUMBER AND DEPTH OF FILL (m)

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/SURFACE CONTAMINATION ABOVE SAC FOR ECOLOGICAL RISK
- GROUNDWATER CONTAMINATION ABOVE SAC

AERIAL IMAGE SOURCE: MAPS.AU.NEARMAP.COM

0 10 20 30 40 50
SCALE 1:1000 @A3 METRES

This plan should be read in conjunction with the report.

Title: **SAC EXCEEDANCES PLAN**

Location: PARRAMATTA EAST PUBLIC SCHOOL, PARRAMATTA, NSW

Report No: E35073B

Figure No: 3

JKGeotechnics

PLOT DATE: 23/08/2022 2:20:20 PM DWG FILE: K:\5C EIS JOBS\35000\SIE35073B PARRAMATTA\CAD\E35073B.DWG

© JK GEOTECHNICS

Council Records

L92/4122.

L92/8286/163/453
MR WULFF:kb
689 9333 Ext 426

Department of School Education
22 Main Street
BLACKTOWN NSW 2148

April 30, 1992

Attention: G S Christie

Dear Sir

Re: Development Application - Toilet facilities
61 Albert Street Parramatta

Further to your correspondence dated April 9, 1992 development consent to the demolition and reconstruction of toilet facilities at school premises No. 61 Albert Street Parramatta is issued subject to the attached requirements.

Yours faithfully,

(R B SWORDS)
General Manager

Encl.

J.W.
29.4.92.

To Note: FSC noted 29/4/92 CR.
LG noted 30.4.92
MJ DESR 316/92 RG

29 APR 1992

13 MAY 1992

REFERRED TO ENVIRONMENT
PLANNING & COMMUNITY SERVICES
COMMITTEE

29/4/92

FILED

CONDITIONS OF DEVELOPMENT CONSENT FOR

61 ALBERT STREET PARRAMATTA

REFERENCE: L92/4122/163/453

(1) Compliance with the requirements of the City Health and Building Surveyor, viz:-

(A) The submission of one courtesy set of building plans and a specification for Council's records purposes, such to be prepared in compliance with Ordinance 70 to the Local Governemnt Act, 1991, as amended.

(B) Amplification of ablution and toilet facilities in the event of school enrolments exceeding 270 students.

(2) Compliance with all the requirements of the City Engineer, viz:-

(A) A written undertaking is to be provided prior to the commencement of construction works to repair any damage to Council's assets as a result of the development including demolition.

Town Planner

(W D HYNES)
Director Environmental Services

29/11/92

FROM

(THU)04.16.'92 15:18

PARRAMATTA CITY COUNCIL
16 APR 1992
L92/8286
FILE No. 163/453
FAX

FAX MESSAGE

NEW SOUTH WALES DEPARTMENT OF SCHOOL EDUCATION
METROPOLITAN WEST REGIONAL OFFICE
PROPERTIES SECTION
FAX NO: 671 8792 (FOR ENQUIRIES: 671 8613)

TO: PARRAMATTA CITY COUNCIL	REF. NO:	DATE:
FAX NO:	MW 92/ 583	
ATTENTION: MR J WULFF	FROM: MR G S CHRISTIE DIRECTOR ADMINISTRATION & FINANCE	

Dear Sir

PARRAMATTA EAST PUBLIC SCHOOL
Development Consent L92/4122 163 453

I refer to your letter of 24th March 1992 concerning the abovementioned development consent. The conditions outlined in your letter have been reviewed and the Department of School Education will abide by all conditions apart from thoselisted below.

(1) Compliance with all the requirements of the City Health and Building Surveyor being:
(A) The submission of a courtesy Building Application incorporating one set of building plans and a specification for Council's records purposes, such to be prepared in compliance with Ordinance 70 to the Local Government Act, 1919, as amended.

As you would be aware the Department of School Education is not required to submit a Building Application. However, Council will be provided with one set of building plans and a specification for record purposes.

(B) Amplification of ablution and toilet facilities in the event of school enrolments exceeding 250 students.

Ablution facilities in schools are provided on the number of established classrooms on the school site. You will be pleased to learn that the facilities being provided in the new toilet block will cater for some 270 students or 9 established classes. At present there are only 8 classes established at the school as such provision has been made for future enrolments.

Yours faithfully

21 APR 1992 REFERRED TO TPD.

G S Christie
Director, Administration & Finance
FOR REG POLLOCK
Assistant Director-General

Noted, and Referred to Mike Randall for comments.
JW 21/4/92

9/4/92 21/4/92 REFERRED TO HEALTH & BUILDING DEPARTMENT

L92/8286/163/453

MEMO TO : Mr J. Wulff
FROM : Mr M. Randall
SUBJECT : D/A for Parramatta East Public School Toilet Block
DATE : 27.4.92

With reference to the correspondence recently received from the Dept of School Education, the following comments are made:-

(a) the submission by the Dept of a set of building plans and a specification is acceptable.

(b) as the Dept has nominated a figure of 270 students, for which the toilet facilities will just cover as per the legislative provisions of the new Building Code of Australia, could the condition then be amended to read 270 students in lieu of 250.

MICHAEL H. RANDALL
SENIOR HEALTH & BUILDING SURVEYOR

SEE ALSO LETTER NO. Lg2/8286

R/S 12/4/92 R/S 4/5/92

L92/4122/163/453
MR J. WULFF
6899333 Ext.426

Department of School Education
Metropolitan West Region
22 Main Street
BLACKTOWN 2148

March 24, 1992

Att: W. Szumowski

Development Application - toilet facilities
61 Albert Street, Parramatta.

Reference is made to your development application submitted on 20th February, 1992 seeking Council approval to demolish the existing toilet facilities and construct a new toilet block at the Parramatta East Public School.

Pursuant to Section 91A of the Environmental Planning and Assessment Act, 1979, your agreement to the imposition of the attached conditions is now sought.

Upon receipt of your agreement and a favourable report from the Chief Town Planner, the Town Clerk has delegated authority to grant approval for the abovementioned proposal at 61 Albert Street, Parramatta.

Yours faithfully,

24/3/92

(R.B. SWORDS)
General Manager

JW
24/3/92

25 MAR 1992 REFERRED TO RECORDS SECTION

RO R/S as above

09 APR 1992 REFERRED TO TPD. JW 9/4/92

FILED

09 APR 1992 Please resubmit as above REFERRED TO RECORDS SECTION 4/5/92

DEVELOPMENT CONSENT CONDITIONS

61 ALBERT STREET, PARRAMATTA.

Ref: L92/4122/163/453

(1) Compliance with all the requirements of the City Health and Building Surveyor being:-

(A) The submission of a courtesy Building Application incorporating one set of building plans and a specification for Council's records purposes, such to be prepared in compliance with Ordinance 70 to the Local Government Act, 1919, as amended.

(B) Amplification of ablution and toilet facilities in the event of school enrolments exceeding 250 students.

(2) Compliance with all the requirements of the City Engineer, viz:-

(A) A written undertaking is to be provided prior to the commencement of construction works to repair any damage to Council's assets as a result of the development including demolition.

.....
Town Planner.

.....
(W.D. HYNES)
Chief Town Planner.

Type

L92/4122/163/453

Department of School Education
Metropolitan West Region
22 Main Street
BLACKTOWN 2148

Contact : Mr J. Wulff
Telephone : 6899333 ext 426
23 March, 1992

ATTENTION : W. Szumowski

Dear Sir,

Re : Development Application - toilet facilities at 61 Albert Street, Parramatta.

Reference is made to your development application submitted on 20 February 1992 seek Council approval to demolish the existing toilet facilities and construct a new toilet block at the Parramatta East Public School.

Pursuant to Section 91A of the Environmental Planning and Assessment Act, 1979 your agreement to the imposition of the attached conditions is now sought.

Upon receipt of your agreement and a favourable report from the Chief Town Planner, the Town Clerk has delegated authority to grant approval for the abovementioned proposal at 61 Albert Street, Parramatta.

Y. F.

DEVELOPMENT CONSENT CONDITIONS

61 Albert Street, Parramatta

(1) Compliance with all the requirements of the City Health and Building Surveyor being: -

(A) The submission of a courtesy Building Application incorporating one set of building plans and a specification for Council's records purposes, such to be prepared in compliance with Ordinance 70 to the Local Government Act, 1919, as amended.

(B) Amplification of ablution and toilet facilities in the event of school enrolments exceeding 250 students.

(2) TP 36 viz: -

(A) A written undertaking is to be provided prior to the commencement of construction works to repair any damage to Council's assets as a result of the development including demolition.

SUBJECT : 61 Albert Street, Parramatta.

REFERENCE : L92/4122/163/453

1. Subject Matter:
The Department of School Education on behalf of the Department of Education proposes to demolish the old toilet facilities and construct a new toilet block to cater for the students at Parramatta East Public School.

2 Subject Land : Cnr lot 2 pt 1 S59 MS 6647 known as 61 Albert Street, Parramatta. Located on the southern side of Albert Street (east) between Brabyn and Webb Streets.

3. Zoning :
5(a) Special Uses (school) under the Parramatta Planning Scheme.

4. Present Use
Primary School

5. History of Site.
No previous Town Planning history.

6. City Engineers Report.
Conditionally favourable.

7. Health and Building Report.
Favourable, subject to pertinent conditions.

8. Details of Development Application.
(a) It is proposed to construct a new toilet block, entailing a single storey brick building with a colourbonded metal roof, located within the grounds of Parramatta East Public School. This will require the demolition of the old toilet facilities and

wash house (4 structures in total).

(b) The proposed toilet block will be comprised of both boys and girls facilities, and a store room within the one building. This will replace the four seprate structures which cuccently exist.

9. Comments and Discussion.

(a) The proposal is permissible within the 5(a) Special Uses (school) zone under the Parramatta Planning Scheme.

(b) The proposal fulfils the inherent need to upgrade the existing toilet facilities, by replacing the old wooden structures with a single brick building. In this respect, it is more practical to have all of the toilet facilities in one (1) building, rather than being distributed among four (4) seprate structures.

(c) Discussion with the applicant indicated that the additional area of open spnce created by the demolition of the toilet facilities will be used as a hard-surface playing area. In this respect, not only is the proposal satisfying the need for new toilet facilities, it is also catering to the need for a larger hard-surfaced playing area.

(d) It is considered that the removal of the one (1) coral tree (involved with this development) will not have a significant impact on the aesthetics of the school.

(e) No social, economic or environmental problems appear to arise as a result of this proposal.

10. Environmental Planning and Assessment Act.

All the matters required to be considered under Section 90(1) of the Environmental Planning and Assessment Act 1979, have been considered in the preparation of this report.

Appendix "A" to Administrative
Instruction No. 79

DEVELOPMENT APPLICATION ACTION SHEET

ALLOCATION: (i) DCU/J.W.
(ii)

ADDRESS: COR BRABYN & ALBERT STS. PMATTA

DEVELOPMENT APPLICATION REFERENCE: L92/4122/163/453

DATE RECEIVED IN TOWN PLANNING DEPARTMENT: 21-2-92

---

1. PLEASE REFER TO TOWN PLANNING INQUIRY/CERTIFICATES CLERK FOR CHECKING -

   (i) Additional information required - YES NO
   (ii) Date of letter -
   (iii) For further processing - YES

---

2. APPLICATION ACKNOWLEDGED - YES DATE NO

---

3. ADVERTISING - YES NO

   (i) 342ZA
   (ii) ORDINANCE REQUIREMENT
   (iii) COUNCIL POLICY (PLEASE HIGHLIGHT IF NECESSARY)

---

4. PREVIOUS HISTORY

---

5. APPROVAL POSSIBLE UNDER DELEGATED AUTHORITY - YES NO

---

6. DEVELOPMENT CONTROL UNIT - YES NO

   (i) CH&BS ka
   (ii) CE ka 25.2.92

   REQUIRED DATE OF RETURN

---

7. DESIGNATED DEVELOPMENT - YES NO

---

8. TRAFFIC AUTHORITY -

   (i) PARRAMATTA LOCAL ADVISORY COMMITTEE FOR GENERATING DEVELOPMENT YES NO
   (ii) REGIONAL ADVISORY COMMITTEE YES NO
   (iii) STATE ADVISORY COMMITTEE YES NO

---

9. ACTION REQUIRED -

   (i) ACKNOWLEDGE D.A.
   ~~(ii) M/S ROGERS FOR ADVERTISING~~
   (iii) D.C.U. PLEASE

(N) Mr J. Wuff

.....
Deputy Chief Town Planner
24/2/92

DEVELOPMENT APPLICATION

ZONING & LOCATION SHEET

ADDRESS: 61 ALBERT ST PARRAMATTA
CNR LOT 2 PT 1

REFERENCE NO: L92|4122|163|453

(a) **ZONING:** 5(a) Special Uses (School) PPS.

(b) **OWNERSHIP:** DEPT OF EDUCATION
PARRAMATTA EAST PUBLIC SCHOOL
PO BOX 213 PARRAMATTA

LOCATION SKETCH:

R Grant

TECHNICAL OFFICER.

RT ALBERT ST. EAST ST. BRABYN ST. WEBB SYMONDS CAMERON

East Parramatta Public School

M. S. 6647 S.Y.

1·242 HA.

M.S.14582 SY.

572461

201312

803505

17439

21757

18872

163125

794926

18893

F. P. 387241

35823

PARRAMATTA CITY COUNCIL
21 FEB 1992
L 92/4122
FILE No. 163/453

Parramatta City Council

Council Chambers, Civic Place,
Parramatta NSW 2150
All correspondence to:
The City Manager
PO Box 32, Parramatta NSW 2124
Telephone: 689 9333
Fax: 891 1320 DX 8279 Parramatta
Business Hours:
8.30 am - 4.30 pm, Monday - Friday

ENVIRONMENTAL PLANNING AND ASSESSMENT ACT. 1979

NOTICE OF CHANGE OF USE OF PREMISES IN ACCORDANCE WITH STATE ENVIRONMENTAL PLANNING POLICY NO. 4 DEVELOPMENT WITHOUT CONSENT AS AMENDED

APPLICANT NAME: DEPT OF SCHOOL EDUCATION
METROPOLITAN WEST REGION

FULL POSTAL ADDRESS: 22 MAW ST.
BLACKTOWN Postcode: 2148

TELEPHONE: 671 8613

FOR OFFICE USE ONLY

LETTER No. L

FILE No.

I W. SZUMOWSKI.
of Dept Of School Education
hereby give notice of the change of use of the premises described in this notice.

NOTE: Plans (four (4)), drawn to scale, showing the buildings on site illustrating means of access, loading facilities and car parking must accompany this application.

(A) **DESCRIPTION OF THE LAND TO WHICH THIS NOTICE RELATES:**

NO.: ..... **STREET:** Brabyn & Albert Sts

SUBURB: PARRAMATTA

REAL PROPERTY DESCRIPTION: Primary School

DESCRIPTIONOF BUILDING: Administration Classrooms & Toilets.

(B) **PRESENT USE OF THE SITE AND OF THE BUILDING:** School.

362/61/6

(C) **DESCRIPTION OF PROPOSED USE/DEVELOPMENT:** Demolish old toilet facilities and construct new toilet block to cater for students at the school

(D) **PROPOSED HOURS OF OPERATION:** School Hours.

(E) **PROPOSED NUMBER OF EMPLOYEES:** N/A

(F) **SIGNATURE OF APPLICANT:** W.Szu.

(G) **CONSENT OF OWNER:**

I W. SZUMOWSKI for Reg TOLLOCK, ASST. DIRECTOR GENERAL DEPT of SCHOOL EDUCATION METROPOLITAN WEST REGION

of .....
being the owner of the land to which this notice relates hereby consent to the making of this notice.

W.Szu. Date: 18.2.92

Signature of owner or person acting for or on behalf of owner. Where not signed by owner, state capacity in which consent is signed.

RECEIVED
THE AMOUNT OF
$ 50.00
DATE 20.2.92
REC. No. 4915

To be completed

(a) Where the land to which the related, does not comprise Crow and applicant is not owner.

(b) Where the land comprises Crown l and the applicant is not the la occupier or owner of that land.

21 FEB 1992 REFERRED TO TPD.

ok to lodge $50.

Date Fee Paid:

Receipt No.:

L92/4122
163/453

CTP 61 Albert Street Parramatta East.
Development Application for school toilet Block.

1/ This application proposes to replace 3 existing toilet blocks with a new single block. well inside the school boundaries.

2/ In view of the scale of the works involved it is not considered appropriate to require any roadworks constructions as a condition of any consent.

3/ As this is a state Government application with no building application likely to be submitted it is

3/ As there will be no significant increase in impervious area it is not considered necessary to provide on site detention in conjunction with the development.

4/ It would normally be appropriate to require a bond of $1000 against damage to council property due to demolition works.

5/ However, ~~as~~ as this is a state Government application it is considered that this bond could be replaced by a written undertaking from the Department of School Education to ~~carry out any~~ restore any damage to Council's assets due to the development to the satisfaction of the city Engineer.

6/ Recommendation.

Any approval of this application be subject to the following condition :-

100% RECYCLED PAPER

" A written undertaking is to be provided prior to the commencement of construction works to repair any damage caused to Council's assets as a result of the development including demolition."

JC 19/3/92

IPB 20.3.92

100% RECYCLED PAPER

P.Z
25-2-92

LET REF: L92/4122
FILE: 163/661

ADDRESS: 61 ALBERT ST.

DEVELOPMENT APPLICATION ENGINEERING CONDITION SITE INSPECTION STREET FRONTAGE: ALBERT ST

FOOTPATH CONDITIONS:

	PROPERTY FRONTAGE		CONDITIONS IN STREET IN GENERAL			
			SAME SIDE	%	OPPOSITE SIDE	%
Constructed:	(Y)/N	good/sat/fair/poor	(Y)/N	80	(Y)/N	80
concrete	(Y)/N	good/(sat)/fair/poor	(Y)/N		(Y)/N	
bitumen	Y/(N)	good/sat/fair/poor	Y/(N)		Y/(N)	
paving-clay	Y/(N)	good/sat/fair/poor	Y/(N)		Y/(N)	
-conc	Y/(N)	good/sat/fair/poor	Y/(N)		Y/(N)	
Street trees/shrubs on footpath area	(Y)/N		(Y)/N		(Y)/N	

Level high/(low)

Site level above/(below) street level

DRAINAGE CONDITIONS:

Street drainage available Y/(N)
adjacent Y/(N)
nearby Y/(N) (approx. distance m)

Ability to drain site to E4 (Y)/N (by gravity) ~~(by pump)~~/(without easement)
by pumpout only (reverve at rear/low spot)

STREET CONDITIONS:

Road pavement bitumen seal (full) width/central pavement only
Pavement sealed condition is good/(sat)/fair/poor
Road shoulder pavement bitumen seal (Y)/N (if Y condition is good/(sat)/fair/poor)
Integral concrete kerb & gutter (Y)/N (if Y condition is good/(sat)/fair/poor)
Kerb - sandstone/concrete Y/(N) (if Y condition is good/sat/fair/poor)
Gutter - sandstone/concrete Y/(N) (if Y condition is good/sat/fair/poor)

SITE VEHICLE ACCESS:

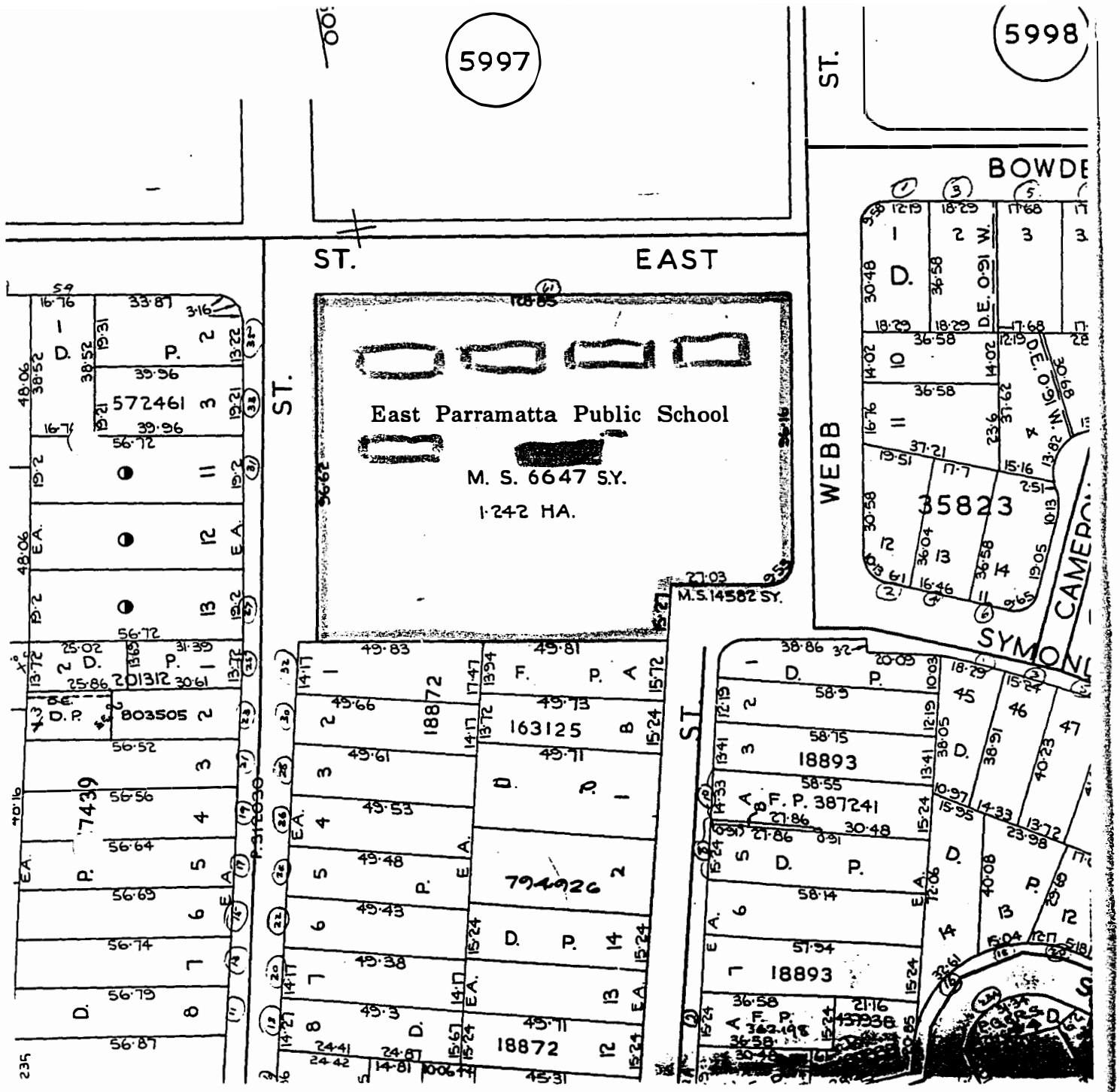
Currently available Y/(N)
Layback constructed Y/(N) concrete/sandstone/bitumen
condition good/sat/fair/poor
Slab constructed Y/(N) concrete/bitumen/paving
condition good/sat/fair/poor
Constructed duty heavy/normal/undetermined
Location: ok/needs changing to suit development proposal

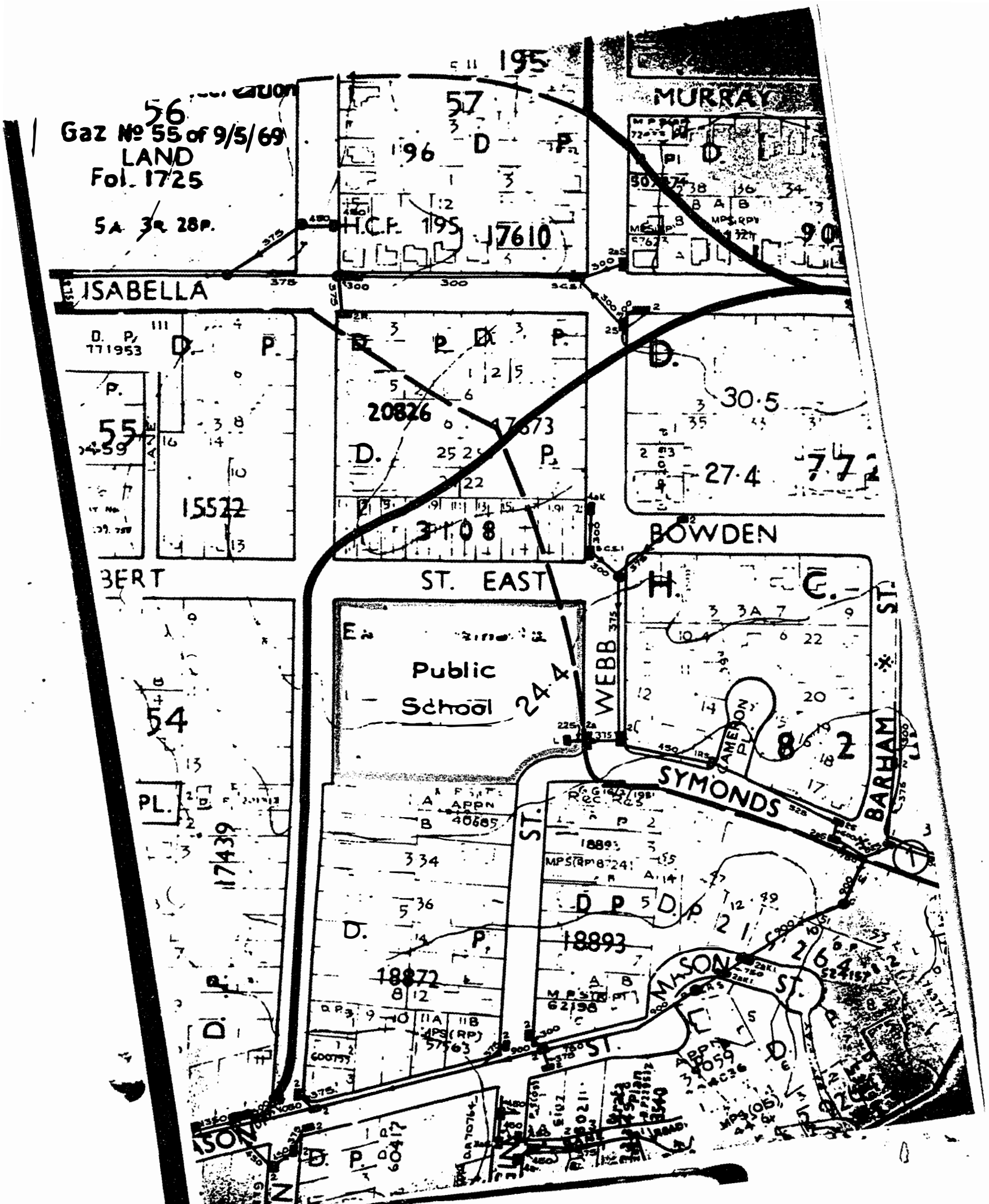
PUBLIC UTILITIES:

Visible in property frontage (Y)/N
Visible in street on same side (Y)/N

Inspecting Officer: [signature]

Date: 18/3/92


5997
5998
ST.
EAST
ST.
BOWDE
WEBB
SYMON
CAMERON
East Parramatta Public School
M. S. 6647 S.Y.
1·242 HA.
M.S.14582 S.Y.
572461
803505
201312
7439
18872
163125
794926
18893
387241
35823
137938


56
Gaz No 55 of 9/5/69
LAND
Fol. 1725
5A 3R 28P.
195
57
196
D
P
MURRAY
ISABELLA
H.C.P. 195
17610
90
D. P. 771953
55
15522
20826
17673
3108
30·5
27·4
BOWDEN
ST. EAST
H. C.
Public School
24·4
WEBB
CAMERON
SYMONDS
BARHAM
54
17439
PL.
APPN 40685
334
18893
18872
MASON
ST.
BERT

13 01 '92 14:03 ☎61 2 6896407 P MATTA TOWN PL. P.01

PARRAMATTA CITY COUNCIL
21 FEB 1992
FILE No. 163/453

Parramatta City Council

Council Chambers, Civic Place,
Parramatta NSW 2150
All correspondence to:
The City Manager
PO Box 32, Parramatta NSW 2124
Telephone: 689 9333
Fax: 891 1220 DX 8279 Parramatta
Business Hours:
8.30 am - 4.30 pm, Monday - Friday

ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979

NOTICE OF CHANGE OF USE OF PREMISES IN ACCORDANCE WITH STATE ENVIRONMENTAL PLANNING POLICY NO. 4 DEVELOPMENT WITHOUT CONSENT AS AMENDED

APPLICANT NAME: DEPT OF SCHOOL EDUCATION
METROPOLITAN WEST REGION

FULL POSTAL ADDRESS: 22 MAW ST.
BLACKTOWN Postcode: 2148

TELEPHONE: 671 8613

FOR OFFICE USE ONLY

LETTER No. L

FILE No.

I W. SLAWINSKI
of Dept Of School Education
hereby give notice of the change of use of the premises described in this notice.

NOTE: Plans (four (4)), drawn to scale, showing the buildings or site illustrating means of access, loading facilities and car parking must accompany this application.

( ) DESCRIPTION OF THE LAND TO WHICH THIS NOTICE RELATES:

NO.: STREET: Brabyn & Albert Sts

SUBURB: PARRAMATTA

REAL PROPERTY DESCRIPTION: Primary School

DESCRIPTIONOF BUILDING: Administration Classroom & Toilets.

(B) PRESENT USE OF THE SITE AND OF THE BUILDING: School.

362|61|6

(C) DESCRIPTION OF PROPOSED USE/DEVELOPMENT: Demolish old toilet facilities and construct new toilet blocks to cater for students at the school

( ) PROPOSED HOURS OF OPERATION: School Hours.

(E) PROPOSED NUMBER OF EMPLOYEES: N/A

(F) SIGNATURE OF APPLICANT: W.Slawinski.

(G) CONSENT OF OWNER:

I W.SLAWINSKI for Reg Pollock, ASST. DIRECTOR GENERAL, DEPT OF SCHOOL EDUCATION, METROPOLITAN WEST REGION

of

Being the owner of the land to which this notice relates hereby consent to the making of this notice.

W.Slawinski. Date: 18.2.92

Signature of owner(s) (where agent acting for on behalf of owner where not signed by owner, state capacity in which consent is signed)

21 FEB 1992 REFERRED TO TPD

ok to lodge $50.

RECEIPT
FEE: $50.00
DATE: 20.2.92
REC. No: 4915

To be completed

(D) Where the land to which the related, does not comprise Crown and applicant is not owner

(E) Where the land comprises Crown and the applicant is not the lessee or occupier or owner of that land

Date Fee Paid:

Receipt No.:

PARRAMATTA CITY COUNCIL 25/02/92 09.36 AM

MEMORANDUM

TO : CITY ENGINEERS DEPARTMENT

SUBJECT : DEVELOPMENT APPLICATION

D.A. NUMBER : L92/04122 FILE NO: 163/453
PROPERTY : 61 ALBERT ST
LOT DESC. : CNR LT 2 PT1 S 59 MS 6647
DATE RECEIVED: 20/02/92
PROPOSAL : CONSTUCT NEW TOILET BLOCK TO CATER FOR STUDENT AT THE
: SCHOOL DEMOLITION OF OLD TOILET BLOCK

Previous History:

THE ATTACHED DEVELOPMENT APPLICATION AND PLAN(S) ARE HEREWITHIN SUBMITTED FOR YOUR CONSIDERATION PRIOR TO FURTHER ATTENTION BY THE PLANNING DEPARTMENT.
YOUR EARLY ADVICE WILL BE APPRECIATED.

.....

Mr William Hynes
CHIEF TOWN PLANNER
PER:

PARRAMATTA CITY COUNCIL
21 FEB 1992
FILE No. 163/453

Parramatta City Cou[illegible]

Council Chambers, Civic Place,
Parramatta NSW 2150
All correspondence to:
The City Manager
PO Box 32, Parramatta NSW, 2150
Telephone: 689 9333
Fax: 891 7309 DX 8279 Parramatta
Business Hours:
8.30 am - 4.30 pm, Monday - Friday

ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979

NOTICE OF CHANGE OF USE OF PREMISES IN ACCORDANCE WITH STATE ENVIRONMENTAL PLANNING POLICY NO. - DEVELOPMENT WITHOUT CONSENT AS AMENDED

APPLICANT NAME: DEPT OF SCHOOL EDUCATION
METROPOLITAN WEST REGION

FULL POSTAL ADDRESS: 22 MAW ST.
BLACKTOWN Postcode: 2148

TELEPHONE: 671 8613

FOR OFFICE USE ONLY

LETTER No. L

FILE No.

I: W. SZWAJKOWSKI.

of: Dept Of School Education

hereby give notice of the change of use of the premises described in this notice.

NOTE: Plans (four (4)), drawn to scale, showing the building or site illustrating means of access, loading facilities and car parking must accompany this application.

(a) DESCRIPTION OF THE LAND TO WHICH THIS NOTICE RELATES:

NO.: STREET: Brabyn & Albert Sts

SUBURB: PARRAMATTA

REAL PROPERTY DESCRIPTION: Primary School

DESCRIPTION OF BUILDING: Administration, Classrooms & Toilets.

(d) PRESENT USE OF THE SITE AND OF THE BUILDING: School.

362/61/6

(c) DESCRIPTION OF PROPOSED USE/DEVELOPMENT: Demolish old toilet facilities and construct new toilet block to cater for students at the school

(f) PROPOSED HOURS OF OPERATION: School Hours.

(g) PROPOSED NUMBER OF EMPLOYEES: N/A

(h) SIGNATURE OF APPLICANT: W.Szw.

(i) CONSENT OF OWNER:

I: W. SZWAJKOWSKI for Reg LOVELOCK ASST. DIRECTOR GENERAL DEPT OF SCHOOL EDUCATION METROPOLITAN WEST REGION

of

being the owner of the land to which this notice relates hereby consents to the making of this notice.

W.Szw. Date: 18.2.92

Signature of owner(s) where not signed by owner, state capacity in which consent is signed

$50.00
DATE 20.2.92
REC. No 4915

To be complete:

(a) Where the land to which the related does not comprise Crow and applicant is not owner.

(b) Where the land comprises Crow and the applicant is not the occupier or owner of that land

Date fee paid:

Receipt No.:

21 FEB 1992 REFERRED TO TPD

ok to lodge $50.

Ordinance 70 Report No. _____

Checked By _____

THE PARRAMATTA CITY COUNCIL

HEALTH AND BUILDING DEPARTMENT

ORDINANCE 70 REQUIREMENTS RELATIVE TO DEVELOPMENT APPLICATION NO. 92/4122/163/453

ADDRESS OF PREMISES:

61 Albert St Parramatta

APPLICANT'S NAME & ADDRESS:

Dept of School Education; Metrop West Regn. 22 Main St Blacktown

EXISTING USE OF BUILDING:

School. (new amenities block to replace dilapidated facilities)

CLASS OF BUILDING - Existing: IX **Proposed:** no change

FIRE ZONE: outside **RISE IN STOREYS** 2e

TYPE OF CONSTRUCTION: type 5 (or type C)

RECOMMENDATION:

1. No objection is raised to the proposed amenities block.
2. Plans and specifications shall be submitted for approval prior to the commencement of any building works. . Such application and plans are to comply with the requirements of Local Government Act, 1919, as amended, and Ordinance 70, as amended.
3. Due to the nubr of facilites provided, the nubr of students accomodated at the school should not exceed 250.

JU

27.2.92
(Date)

(Health and Building Surveyor)

PARRAMATTA CITY COUNCIL 25/02/92 09.35 AM

MEMORANDUM

TO : HEALTH AND BUILDING DEPARTMENT

SUBJECT : DEVELOPMENT APPLICATION

D.A. NUMBER : L92/04122 FILE NO: 163/453
PROPERTY : 61 ALBERT ST
LOT DESC. : CNR LT 2 PT1 S 59 MS 6647
DATE RECEIVED: 20/02/92
PROPOSAL : CONSTUCT NEW TOILET BLOCK TO CATER FOR STUDENT AT THE
: SCHOOL DEMOLITION OF OLD TOILET BLOCK

Previous History:

THE ATTACHED DEVELOPMENT APPLICATION AND PLAN(S) ARE HEREWITHIN SUBMITTED FOR YOUR CONSIDERATION PRIOR TO FURTHER ATTENTION BY THE PLANNING DEPARTMENT.
YOUR EARLY ADVICE WILL BE APPRECIATED.

.....

Mr William Hynes
CHIEF TOWN PLANNER
PER:

230 - 250 students

say 125 males & 125 females

Males WC's : 2 for 1st 70 the 1 for each 70 thereafter : 2+1 = 3

Urinals : 2 for 1st 70 " " 35 " : 2+1+1 = 4

Washbasins - 2 " 40 " 40 " : 2+1+1+1 = 5

Females. Females : 2 for 1st 20 the 1 for each 20 thereafter : 2+1+1+1+1+1+1 = 8

Washbasins : 2 for 1st 40 the " " 40 " : 2+1+1 = 5.

PARRAMATTA CITY COUNCIL
21 FEB 1992
FILE No. 163/453

Parramatta City Council

Council Chambers, Civic Place,
Parramatta NSW 2150
All correspondence to:
The City Manager
PO Box 32, Parramatta NSW 2124
Telephone: 689 9333
Fax: 891 1320 DX 8279 Parramatta
Business Hours:
8.30 am - 4.30 pm, Monday - Friday

ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979

NOTICE OF CHANGE OF USE OF PREMISES IN ACCORDANCE WITH STATE ENVIRONMENTAL PLANNING POLICY NO. 4 DEVELOPMENT WITHOUT CONSENT AS AMENDED

APPLICANT NAME: DEPT OF SCHOOL EDUCATION
METROPOLITAN WEST REGION

FULL POSTAL ADDRESS: 22 MAIN ST.
BLACKTOWN Postcode: 2148

TELEPHONE: 671 8613

FOR OFFICE USE ONLY

LETTER No. L

FILE No.

I: W. SZWAJEWSKI.
of Dept Of School Education
hereby give notice of the change of use of the premises described in this notice.

NOTE: Plans (four (4)), drawn to scale, showing the buildings on site illustrating means of access, loading facilities and car parking must accompany this application.

(A) DESCRIPTION OF THE LAND TO WHICH THIS NOTICE RELATES:

NO.: STREET: Brabyn & Albert Sts

SUBURB: PARRAMATTA

REAL PROPERTY DESCRIPTION: Primary School

DESCRIPTIONOF BUILDING: Administration Classrooms & Toilets.

(B) PRESENT USE OF THE SITE AND OF THE BUILDING: School.

362|61|6

(C) DESCRIPTION OF PROPOSED USE/DEVELOPMENT: Demolish old toilet facilities and construct new toilet block to cater for students at the school

(D) PROPOSED HOURS OF OPERATION: School Hours.

(E) PROPOSED NUMBER OF EMPLOYEES: N/A

(F) SIGNATURE OF APPLICANT: W.Sh.

(G) CONSENT OF OWNER:

I: W.SZWAJEWSKI for Reg POLLOCK ASST. DIRECTOR GENERAL DEPT OF SCHOOL EDUCATION METROPOLITAN WEST REGION

of

being the owner of the land to which this notice relates hereby consent to the serving of this notice.

W.Sh. Date: 18.2.92

Signature of owner - person signing for or on behalf of owner. Where not signed by owner, state capacity in which consent is signed.

RECEIVED
THE AMOUNT OF
$ 50.00
DATE 20.2.92
REC. No. 41915

To be completed

(A) Where the land to which the notice related, does not comprise Crown land and applicant is not owner.

(B) Where the land comprises Crown land and the applicant is not the lessee occupier or owner of that land

Date Fee Paid:

Receipt No.:

21 FEB 1992 REFERRED TO TPD

ok to lodge $50.

NSW Dept Public Works & Services
Att: Anthony Liem
PO Box 1521
NORTHGATE NSW 1635

Dear Sir,

Notice of Determination of a Development Application issued under the Environmental Planning and Assessment Act 1979 Section 81 (1) (a)

Development Application No.: JQ/01345/00

Property Address: MS 6647SY,
61 Albert Street East,
NORTH PARRAMATTA NSW 2151

Proposed Development: To erect an extension to the existing library of Parramatta East Public School and to remove two (2) trees.

Building Code of Australia Building Classification: 9(b)

You are advised that the abovementioned development application including plans numbered DA.01-05 has been granted consent subject to the following conditions:-

1. All building work must be carried out in accordance with the provisions of the Building Code of Australia.
   Reason: To comply with the Environmental Planning and Assessment Act Regulations.

2. All excavations and backfilling associated with the erection or demolition of a building must be executed safely and in accordance with appropriate professional standards. All excavations associated with the erection or demolition for a building must be properly guarded and protected to prevent them from being dangerous to life or property
   Reason: To ensure safety.

3. A sign must be erected in a prominent position on any work site on which work involved in the erection or demolition of a building is being carried out; stating that unauthorised entry to the work site is prohibited; and showing the name of the person in charge of the work site and a telephone number at which that person may be contacted outside working hours.
   Any such sign is to be removed when the work has been completed.
   Reason: To provide information regarding the site.

FILE COPY

4. Prior to the commencement of any works that involve the physical disturbance of the site, surface water and sediment control measures, including those shown on the approved plan(s), shall be implemented. The measures shall be utilised and maintained during the development at all times.
   Reason: To prevent erosion and control sediment.

5. Prior to the commencement of any works in the vicinity of trees or other existing site features that are to be retained (either on-site or on adjoining street reserve), physical protection measures including those shown on the approved plans shall be implemented and maintained at all times.
   Reason: To ensure protection measures are in place.

6. Building work may only be carried out six (6) days a week, Monday to Friday between the hours of 7.00am to 8.00pm and Saturday 8.00am to 8.00pm. No work is permitted to be carried out on Sundays or Public Holidays.
   Reason: To protect the amenity of the area.

7. A replacement Lophostemon Confertus tree of advanced height (45 litre container) shall be planted within the school ground.
   Reason: To maintain the environmental amenity of the area.

You are also advised that the consent shall lapse if the development to which it refers is not substantially commenced within 5 years of the date of determination of the consent.

This development consent operates from the date of determination.

B Siciliano

Mr B Siciliano
Authorised Officer

17 November 2000

Date of Determination

COPY FILE

ATTN BRUNO SICILIANO fax 9806 5917
PARRAMATTA CITY COUNCIL

SECTION 2: PRELIMINARIES

This is a standard condition in our ie DPWS Conditions of Contract Regards Anthony Liem

1 GENERAL

1.1 [redacted]

Requirement

Before commencing work under the Contract, the Contractor shall:

(a) pay to the Building and Construction Industry Long Service Payments Corporation or the Corporation's agent the amount of the long service payable in respect of the building and/or construction work under the Building and Construction Industry Long Service Payments Act, 1986; and

(b) produce to the Superintendent the document evidencing payment of the levy as referred to in (a).

1.2 FIELD DATA CAPTURE

Requirement

The Contractor is to provide Field Data Capture as per the requirements of SECTION 31 – FIELD DATA CAPTURE and the Reference Document titled "Specification for Field Data Capture Version August 1997".

Comply with the services requirement stated in the document.

2 DOCUMENTS

2.1 SITE INFORMATION SUPPLIED BY THE PRINCIPAL

Site Conditions

The information made available by the Principal does not completely show the existing Site conditions. The Principal is not responsible for any interpretation, deductions and conclusions made by the Contractor from the information made available and the Contractor shall accept full responsibility for any such interpretations, deductions or conclusions.

Where the Principal has not given possession of all the Site, the Contractor may apply for approval which shall not be unreasonably withheld to carry out further site investigation.

Errors and Omissions

The following documents supplied by the Principal to the Contractor before the Date of Acceptance of Tender could include errors or omissions or could be misleading. Notwithstanding that the Principal may have been negligent, or would but for this clause be vicariously liable for the negligence of others, in preparing or supplying the information, the Contractor shall have no claim in tort, contract or otherwise against the Principal arising from the errors or omissions or the fact that the Contractor was misled.

Reports

- Hazardous Material Survey for Blocks A and R Report no. EMS 98/1167
- Geotechnical report no. 13333 JTD/ac dated 15 May 1998.
- Specification for Field Data Capture – Version August 1997

AND SERVICES

ABN 48 922 006 182
Telephone 02 9472 7900
Facsimile 02 9477 3356

18 October 2000

MACKELLAR GIRLS HIGH SCHOOL

Memo to: Bruno Sciliano.

DEVELOPMENT APPLICATION -

Tree Management Assessment

D/A no: _____ ***Date referral received:*** 11-10-00.

Address: Parramatta East Public School.

Species:	**Health:**	**Rec:**
Tree 1: Eucalyptus nicholii	P	RM
Tree 2: Lophostemon confertus.	G	RM
Tree 3:		
Tree 4:		
Tree 5:		
Tree 6:		
Tree 7:		
Tree 8:		
Tree 8:		
Tree 10:		

Site Map

See Attached.

Street frontage

Health: ***G-Good*** ***F-Fair*** ***P-Poor***

Recommendation: RM –Remove, RT –Retain, PR - Prune

Recommended subject to the following conditions;

** A separate application for consent to prune or remove a tree / trees on private property shall be made on Council's Application for consent to prune or remove a tree by the owner of the land on which the act of pruning is to be carried out or by any person with the consent in writing of that owner.*

Additional Conditions / Comments:

Replacement species Proposed to provide sufficient screening to building also.
A Replacement for the Lophostemon confertus of same species in 45Ltr to be planted elsewhere within school Grounds.

Inspecting Officers signature: R Thuth ***Inspected/Completed:*** 16/10/00

18 October, 2000

NSW Dept Public Works & Services
Atn: Anthony Liem
PO Box 1521
Northgate 1635

Dear Sir/Madam,

Development Application: JQ/01345/00
Property: 61 Albert Street East,
NORTH PARRAMATTA NSW 2151

Reference is made to your development application for the abovementioned premises seeking Council approval for the development detailed below:-

> To erect an extension to the existing library of Parramatta East Public School and to remove two (2) trees.

Pursuant to Section 115I of the Environmental Planning and Assessment Act 1979, the Department of Public Works and Services is requested to provide written concurrence to the following conditions of development consent:-

1. All building work must be carried out in accordance with the provisions of the Building Code of Australia.
   Reason: To comply with the Environmental Planning and Assessment Act Regulations.

2. All excavations and backfilling associated with the erection or demolition of a building must be executed safely and in accordance with appropriate professional standards. All excavations associated with the erection or demolition for a building must be properly guarded and protected to prevent them from being dangerous to life or property
   Reason: To ensure safety.

3. A sign must be erected in a prominent position on any work site on which work involved in the erection or demolition of a building is being carried out; stating that unauthorised entry to the work site is prohibited; and showing the name of the person in charge of the work site and a telephone number at which that person may be contacted outside working hours.
   Any such sign is to be removed when the work has been completed.
   Reason: To provide information regarding the site.

COPY FILE

4. Prior to the commencement of any works that involve the physical disturbance of the site, surface water and sediment control measures, including those shown on the approved plan(s), shall be implemented. The measures shall be utilised and maintained during the development at all times.
   Reason: To prevent erosion and control sediment.

5. Prior to the commencement of any works in the vicinity of trees or other existing site features that are to be retained (either on-site or on adjoining street reserve), physical protection measures including those shown on the approved plans shall be implemented and maintained at all times.
   Reason: To ensure protection measures are in place.

6. Building work may only be carried out six (6) days a week, Monday to Friday between the hours of 7.00am to 8.00pm and Saturday 8.00am to 8.00pm. No work is permitted to be carried out on Sundays or Public Holidays.
   Reason: To protect the amenity of the area.

7. A replacement Lophostemon Confertus tree of advanced height (45 litre container) shall be planted within the school ground.
   Reason: To maintain the environmental amenity of the area.

You are also advised that the consent shall lapse if the development to which it refers is not substantially commenced within five (5) years of the date of notification of the consent.

Should you have any enquiries, please contact the undersigned between the hours of 9.00am and 11.00am, Monday to Friday.

Yours faithfully,

Mr B Siciliano
Town Planner - DA Assessment Team

FILE COPY

Matters for Consideration Under Section 79c(1) of the Environmental Planning and Assessment Act 1979 As Amended in 1997

The relevant of the following matters have been taken into consideration in the assessment and determination of the

DA No.: 00/1345 **Property:** 61 Albert Street East, Nth Pitta

MATTERS FOR CONSIDERATION		COMMENTS (attach additional sheets if required)
(a)	The provisions of (i) any environmental planning instrument, and	The proposed development/use is permissible in the Special Uses 5(a) zone under the relevant Environmental Planning Instrument.
	(ii) any draft environmental planning instrument that is or has been placed on public exhibition and details of which have been notified to the consent authority, and	1. Consistent with the objectives or the draft ~~REP~~ LEP ~~OR~~ ~~2. N/A~~
	(iii) any development control plan, and	All requirements have been satisfied and the DCP objectives have been met.
	(iv) any matters prescribed by the regulations	Satisfied by the assessment and issue of consent.
(b)	the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality.	No adverse impact on the environment is envisaged as a result of this proposal.
(c)	the suitability of the site for the development	The site can accommodate the proposed development.
(d)	any submissions made in accordance with this Act or the regulations.	NO
(e)	the public interest	The proposal is in the public interest.

APR130 **PROPERTY ENQUIRY** 8/09/00
Options 11:49:32

Prope_ _y.. **61 Albert Street East, NTH PARRAMATTA NSW 2151** Wd **5**
Application Number **JQ/01345/00** (Evaluation) **Local. Eudcat.Estab/SportsCent**
Description : Applicant **NSW Dept Public Works & Services**
addition to existing library **Atn: Anthony Liem**
~~and upgrade of awnings~~ **PO Box 1521**
Northgate 1635
Task:

1=Select Option

_ **Data**	_ Affected Properties	_ **Records**
_ **Names**	_ References	
_ Conditions	_ Related Applications	
_ **Work Procedure**	_ Certificates	
_ **Fees**	_ Inspections	
_ **Zone/Land Use**	_ Permits	
_ **Extended Property Data**	_ Memo	
_ **Additional Properties**	_ Contribution	
_ Development Data	_ Development Departures	

Jump to ... ____

F3=Exit F4=Escape F6=Accept F12=Page Back F7=Prv.Desc F8=Next Desc

Request Form for Advertising/Notification of Development Application

DA No.: 00 / 1345

Property (Include all lots): _____

Proposal: As above Yes / No _____

Extension of existing library

Responsible Officer: Bruno SICILIANO

Responsible Officer is to attach the following information to this memo:-

- Ensure the GIS sheet has been marked with an 'X' to all properties that require notification letters to be sent.
- A set of plans, Statement of Environmental Effects and any other documents to be displayed for public viewing.

Paper Advertisement	Notification Letters	No. of Days	From	To
Yes/No.	Yes/No.	10	22 / 9 / 00	3 / 10 / 00

PAR09902 **PROPERTY ENQUIRY** 8/09/00

Prop) **61 Albert Street East, NTH PARRAMATTA NSW 2151**
Owner **Department Of School Education** Ward **5**
Mail **Parramatta East Public School, PO Box 213, PARRAMA** **Precinct 2**
Res/Occ **Field of Mars**
Titles **ZZ** **Dummy Title**

Conditions
Parramatta Planning Scheme
Local Environ. Plan No.174
DCP - LEP No. 174
DCP - Places of Public Worsh
DCP - Advertisements
Local Env. Plan 1997 PPS
LEP 1997 PPS Brothels
PPS 1979 Amended by SREP 28+
Total Area **11660SqM**

Parcels **MS 6647SY**

Zone **(C) 5(A)SC Special Uses 5(a) School**
(C) 5(A)SC Special Uses 5(a) School

Messages
Notices
Records
Applications

Land **(C) ES3100 Schools/Churches/Institutions**

F3/4/12 Roll=Next/Prev Prop
Jump **APP** Next Scrn (?)

Development Application

DA No.: _____ Construction Certificate No.: _____)

Responsible Officer: BS. **Date:** 12/9/00

Additional Information Required: _____

Referrals		Date Sent	Returned
Building Surveyor	Yes / No	/ /	/ /
Engineer	Yes / No	/ /	/ /
Health Surveyor	Yes / No	/ /	/ /
Traffic	Yes / No	/ /	/ /
Heritage Advisor	Yes / No	/ /	/ /
Tree Management	Yes / No	/ /	/ /
Integrated Referral to Department	Yes / No	/ /	/ /
TAP Meeting	Yes / No	/ /	/ /

Responsible Officer to carry out inspection &check the following:	
Site Inspection Carried out by :-	
Signuare: _____ Dated: ___/___/___	
Heritage Map Checked	Yes / No
Near a Heritage Item or a Conservation Area	Yes / No
Potential Heritage (Area _____)	Yes / No

Paper Advertisement	Notification Letters	No. of Days	
Yes/ No.	Yes/ No.	10	1. Complete Request Adv/Notifica. Form
From: / /	To: / /		2. Ensure GIS sheet - marked with an 'X'
			3. Ensure A4 plans are correct and attached.

Submission Received: Yes / No	S.79C Assessment Completed Dated: / /
Compliances with delegation of Authority given by General Manager: Yes / No (Quote Del.:)	
Conditions of Approval/Reasons for Refusal provided: Yes / No	
Determination Recommended by:	
Determined by (holder of delegation):	

PARRAMATTA EAST PUBLIC SCHOOL UPGRADE

STATEMENT OF ENVIRONMENTAL EFFECTS

PREPARED BY : NSW DEPARTMENT OF PUBLIC WORKS & SERVICES
PROJECT MANAGEMENT GROUP
SYDNEY REGION

CLIENT: NSW DEPARTMENT OF EDUCATION & TRAINING
SCHOOL SERVICES UNIT, SYDNEY NORTH

1.0 Site Description

- The Site is within the existing school site.

  The owners of the Site are the NSW Department of Education and Training; therefore this proposal is designated as a Crown Development providing an essential community service ie. Public education having no commercial objections.

- The Site is currently open space used by the school for sporting and schools play activities.

- On the East Side along Webb Street, the Site is bounded by a row of trees.

  The Eastern end of Webb Street has a row of large, mature trees which protects the Library from the morning sun.

  The Southern and Western end of the proposal, face the open space of the school.

  The Northern part of the Extension links into the existing Library Building, which is approx. 17 m from the Albert Street East boundary and 2.9 m from the Webb Street boundary.

2.0 Council and Planning Controls

- The Library Extension and Covered Ways are within the Council requirements of setbacks from boundaries, heights limits etc.

- The Library Extension will have external finishes that match the existing Library ie similar brick colour and texture, and similar colour and non-reflective colorbond roofing.

- The Library Extension will have mature shrubs to provide screen planting between the Extension and Webb Street.

- The buildings are designed to have a low operational cost and low maintenance, thus contributing to ecological sustainability.

3.0 Profile of Users

- The Library Extension and Covered Walkway will be used only by the present school population ie staff and students during normal school hours on weekends only.

- The Library Extension will be easily accessible and connected to the other school buildings by having a Covered Way.

4.0 Access for People with Disabilities

- The Library Extension will be accessible and useable by people with disabilities. A Disabled Access Ramp will give access to Library Main Entrance.

5.0 Compatibility with surrounding development etc

5.1 Noise effects

The Library Extension will have normal school library activities related to book borrowing, private study and discussions etc. This will generate minimal noise and not affect surrounding neighbours and areas.

5.2 Overshadowing and Privacy

This is not a factor due to the siting of the extension. The setback from the boundary and the width of Webb Street, including carriageway, footpaths and tree lined nature strips separate the Library Extension from private residences across the road.

5.3 Landscape

Landscaping has been provided to:

- Soften the building outline
- Form a buffer zone between the building and the adjacent streets
- Form a continuation of the surrounding planting of existing trees and shrubs
- Meet Council guidelines on selection of species.

6.0 Stormwater Disposal, earthworks, soil erosion and water management during construction

- Downpipes from the Library Extension roof will be connected to the existing Library stormwater drainage. The Covered Way will drain to the surrounding ground and landscaping and not disturb the existing surface water drainage.

- The Library and Covered Way structure is above ground with pier and beam foundations. There are no earthworks or major excavations.

- The work will be planned and carried out to avoid erosion, contamination and sedimentation of the site, surrounding areas and drainage systems in accordance with Council requirements on "Landfill and Earthworks." This will be included in the Building Contract.

7.0 Traffic generated, vehicular access and car parking

- The Library Extension will be accessed by the present school population ie teachers and students using the covered way system.
- There is no increase in traffic, carpark requirements and vehicular access is not required.
- Pedestrian access from the adjacent streets is by means of the existing gates and footpaths.

8.0 Conclusion

The Environmental Effects of the proposed development have been fully considered. There are no adverse effects on the Environment and the proposal will be of benefit to the local community by providing educational services to local children of primary school age.

PARRAMATTA CITY COUNCIL

Environmental Planning and Assessment Act Application

FOR OFFICE USE ONLY

No. DA/1345/00
Letter Reference 26063
Receipt No. 1191377
Date 7/9/00

DEVELOPMENT CONSENT, CONSTRUCTION CERTIFICATE and/or OTHER APPLICATIONS

Details must be printed. Tick ☑ as applicable.

TYPES OF CONSENT, CERTIFICATE OR APPROVAL REQUIRED (See Notes)

- ☑ Development Consent
- ☐ Construction Certificate
- ☐ Subdivision Certificate
- ☐ Occupation Certificate
- ☐ Integrated Development Approval
- ☐ Appoint Council as Principal Certifying Authority
- ☐ Other Approval under s68 of the Local Govt Act 1993
- ☐ Modification (Amendment) of DA Consent No.....

Description of Property PARRAMATTA EAST PUBLIC SCHOOL

(61 Albert St, east)

Street No.	Street	Suburb
	CNR. BRABYN ST & ALBERT ST EAST	PARRAMATTA 2150

Lot	Section	DP/SP
59	IN	CL 6647-3000

Description of Proposal Indicate if more than one aspect of development is proposed or if deferred commencement or staged development sought.
(e.g. use of land/building, erection of building, subdivision of land, demolition)

EXTENSION OF EXISTING LIBRARY AND COVERED WAYS. (UPGRADE)

Cost of Development (where building/demolition work is involved) $ 350,000
Contract price or genuine estimated value of proposed work

If this application is for a **Construction Certificate**, please specify the following materials and floor area for the new or additional work

External Walls	Frame	Roof	Floor	Floor Area
				m2

Applicant NSW DEPARTMENT OF PUBLIC WORKS AND SERVICES

Surname	Given Names
LIEM	ANTHONY

Postal Address: P.O. BOX 1521, NORTHGATE 1635
Suburb: HORNSBY
Daytime Phone and Fax Number: PH. 94727904 FAX 94773356
Signature: [signature]
Date: 18.08.2000

Builder (if applicable and known)

Surname / Given Names:
Postal Address:
Suburb / Daytime Phone and Fax Number:
Builder/Owner-Builder Licence Permit No.:

Consent of Owner – (All owners must sign) If insufficient space, attach a separate letter

	Mr/Mrs/Ms	Surname	Given Names
Names			

	Street No.	Street	Suburb	Post Code
Postal Address				

Signature of owner/s: Signed by me [signature] as delegate of the Minister for Education and Training pursuant to section 125 of the Education Act 1990 and I hereby certify that I have no notice of the revocation of such delegation.

Date: 30/8/2000

I/We own the subject land and this application has consent to Council Officers entering the Premises during normal office hours for the purpose of conducting inspections relative to this application.

Note: In the case of a body corporate, a seal is required to be affixed and attested in accordance with the relevant statutory authority

NOTES FOR COMPLETING THIS FORM

Definitions/Abbreviations

1. **EPAA**
   The Environmental Planning and Assessment Act 1979 as amended by the Environmental Planning and Assessment Amendment Act 1997.
2. **Development Application/Development Consent (DA/DC)**
   A Development Application for the erection of a building, carrying out of work, use of a building or land, subdivision or demolition for which a Development Consent is required under the provisions of s78A of the EPAA.
3. **Construction Certificate (CC)**
   A Construction Certificate referred to in s109C(1) of the EPAA and which certifies that a building erected in accordance with nominated plans and specifications will comply with the regulations referred to in s81A(5) of the EPAA (eg. Building Code of Australia, Australian Standards, Conditions of DC).
4. **IDA**
   Integrated Development Application which relates to development where consent is required from Council and from one or more other approval bodies referred to in s91 of the EPAA. **Applicants should indicate here other approvals to be obtained.**

Fisheries Management Act 1994	☐s144	☐s201	☐s205	
Heritage Act 1977	☐s.58			
National Parks & Wildlife Act 1974	☐s90			
Pollution Control Act 1970	☐s17a	☐s17c	☐s17d	☐s171
Rivers & Foreshores Improvement Act 1948		☐Part 3A		
Roads Act 1993	☐s138			
Waste Minimisation & Management Act 1995		☐s44		
Water Act 1912	☐s10	☐s13A	☐s18F	☐s20B
	☐s20CA	☐s20L	☐s116	☐Part 8

5. **LGA**
   The Local Government Act 1993.
6. **OA**
   Other Approval obtainable under the provisions of s68 of the LGA which may now be sought in conjunction with a DA or separately. Typical activities which require an approval under the LGA in the Parramatta City Council area include (please indicate here if approval is sought).
   - ☐ installation of a temporary structure, manufactured home or moveable dwelling;
   - ☐ use of a building or temporary structure as a place of public entertainment;
   - ☐ provision of a waste storage container in a public place (eg. skip container on street footpath);
   - ☐ business, trade or entertainment activities on "Community Land";
   - ☐ swing or hoist goods across or over any part of a public road by means of a lift, hoist or tackle projecting over the footway
   - ☐ operating a public car park;
   - ☐ installation of a domestic oil or solid fuel heating appliance (i.e not a portable appliance);
   - ☐ installation or operation of amusement devices (within the meaning of the Construction Safety Act 1912).
7. **Occupation Certificate**
   A certificate referred to in s109C(1)(c) of the EPAA which authorises the occupation and use of a new building (including new work/alterations to an existing building) or a change of use for an existing building.
8. **PCA**
   The Principal Certifying Authority appointed under s109E of the EPAA. The EPAA requires that the person having the benefit of the DC involving building work or subdivision work must appoint a PCA prior to commencement of that work.
   The person may appoint Council (for building or subdivision work) or an accredited private certifier (for building work only) as the PCA. The Council must be notified of the details of the PCA at least 2 days before work commences. Should the applicant wish to appoint Council as the PCA at the initial application stage, please tick the appropriate box on the front page of this form. Otherwise, Council may be appointed by separate notification at least 2 days before work is scheduled to commence.
9. **Subdivision Certificate**
   A certificate referred to in s109C(1)(d) of the EPAA which authorises the registration of a plan of subdivision under Division 3 of Part 23 of the Conveyancing Act 1919.
10. **Cost of Development**
    The $ value indicated is to be the contract price or a genuine estimated value of the building/demolition works involved in the carrying out of the development. The value of the work includes labour and materials and is for the entire development. There will be no reduction to the estimated value granted for materials and/or labour that are donated or provided at a reduced cost. The DA and CC application fees are calculated on a sliding scale based on the estimated value/contract price.

SUBMISSION REQUIREMENTS

INFORMATION REQUIRED TABLE	Number of Copies of Documents Required		
	DA	CC	Joint DA/CC
Development Plans (Note 11)	3	-	Refer to Note 17
Development Details (Note 12)	3	-	" "
Building Plans (Note 13)	-	3	" "
Building Specifications (Note 14)	-	3	" "
Notification Plans (Note 15)	4	-	4
Statement of Environmental Effects (Note 16)	1	-	1

11. Development Plan

Plans describing the proposed development which indicate (where relevant);

(a) location, boundary dimensions, site area and north point of the land;

(b) existing vegetation, trees and fences on the land;

(c) location and uses of buildings on sites adjoining the land, apart from proposals for single dwellings and other minor residential buildings (except swimming pools);

(d) the location and use of existing and proposed new buildings or works (including extensions or additions to existing buildings or works) in relation to the land's boundaries and adjoining development;

(e) floor plans of proposed building showing layout, partitioning, room sizes and intended uses of each part of the building;

(f) elevations and cross sections showing proposed external finishes, heights and finished levels;

(g) proposed finished levels of the land in relation to existing ground levels, buildings and roads;

(h) building perspectives, where necessary to illustrate the proposed building;

(i) proposed parking arrangements, entry and exit points for vehicles, and provision for movement of vehicles within the site including dimensions where appropriate;

(j) proposed landscaping and treatment of the land (indicating plant types and their height and maturity);

(k) proposed methods of draining the land;

(l) extent of overshadowing by shadow diagrams based upon levels obtained by a qualified surveyor.

12. Development Details – a document which demonstrates:

(a) in the case of **shops, offices, commercial or industrial** development:

* details of hours of operation (including nominated days) * plant and machinery to be installed
* type, size and quantity of goods to be made, stored or transported * loading and unloading facilities

(b) in case of a **change of building use** (except where the proposed change is to a Class 1a or Class 10 building) where no alterations or additions to the existing building are proposed:

* a list of any fire safety measures in the building or on the land on which the building is situated in connection with the proposed change of building use, and
* a separate list of such of those measures as are currently implemented in the building or on the land on which the building is situated.

The list must describe the extent, capability and basis or design of each of the measures concerned.

(c) in the case of **subdivision:**

* details of the existing and proposed subdivision pattern (including the number of lots and location of roads)
* details of consultation with public authorities responsible for provision or amplification of utility services required.
* preliminary engineering drawings indicating proposed infrastructure including roads, drainage, water, sewerage, and earthworks.
* existing and finished ground levels

(d) in the case of **demolition:**

* details of age and condition of buildings or works to be demolished.

(e) in the case of **advertisements (signage):**

* details of the size, type, colour, materials and position of the sign board or structure on which the proposed advertisement is to be displayed

(f) in the case of development that requires consent under the *Wilderness Act 1987*:

* a copy of the consent under that Act.

(g) in the case of development involving the **erection of a building, work or demolition:**

* details of the methods of securing the site during the course of construction.

(h) in the case of **swimming pools:**

* the location of the pool filter and the location and uses of buildings on adjoining sites.

13. Building Plan

* Plans of the building drawn in ink and to scale (preferably 1:100 for the general plan and 1:200 for the site plan).
* The general plan shall consist of a floor plan, all elevations of the building and a section indicating the construction.
* The site plan shall include all dimensions of the site, distances to all boundaries, the position of existing and proposed structures and the location of any affected areas and trees.
* Where the proposed building work involves a modification to previously approved plans and specifi the general plans must be coloured or otherwise marked to adequately distinguish the modificat

14. Building Specification

(a) is to describe the construction, materials and relevant standards (i.e. BCA or AS reference) to which the building is to be built and the method of drainage;

(b) state whether the materials proposed to be used are new or second hand and give particulars of any second-hand and materials to be used.

(c) except in the case of an application for a dwelling or associated residential work (i.e. class 1a or class 10 buildings):

- provide a list of any fire safety measures that are proposed to be implemented in the proposed building or on the land on which the building is situated, and
- if the application relates to a proposal to carry out any alteration or rebuilding of, or addition to, an existing building, a separate list of such of those measures as are currently implemented in the building or on the land on which the building is situated.

The list must describe the extent, capability and basis of each of the measures concerned.

(d) where the application involves an alternative solution to meet the performance requirements of the BCA, the application must also be accompanied by:

- details of the performance requirements that the alternative solution is intended to meet, and
- details of the assessment methods used to establish compliance with those performance requirements.

(e) evidence of any compliance certificates, accredited component, process or design sought to be relied upon.

15. Notification Plan

For the purpose of a notification plan and Clause 48B of the Environmental Planning and Assessment Regulation 1994, a plan:

(a) sufficient to identify the applicant, the land to which the application relates, and

(b) containing drawing of the building that indicates its height and external configuration, as erected, in relation to the site on which it is to be erected, is to be submitted with the DA.

A notification plan is not required where the application proposes internal work not affecting the external building elevations.

16. Statement of Environmental Effects Means a written statement which demonstrates that the applicant has considered the impact of the proposed development on both the natural and built environments before and after construction and the proposed method/s to mitigate any adverse impact/s.

17. Joint DA/CC – Where an application is lodged for both a DA and CC together , the number of sets of plans may be reduced to a total of 3 provided the plans submitted include the information required for both a development plan and building plan.

18. Additional Information Requirements

The Information Required Table indicates Council's general requirements relating to various applications. Applicants should also ascertain whether additional information (eg. landscape plan, heritage report, traffic impact statement, detail of construction elements, stormwater drainage design, proof of access/easement arrangements) is required for a particular or complex application. Council encourages pre-lodgment meetings in regard to these types of development.

19. Inspection Fees/Appointing Council as the PCA

There is no fee for appointing Council as the PCA. When this application form is submitted for the purpose of appointing Council as PCA, the inspection fees may be paid at the time of lodgement. In instances where Council is appointed as the PCA, but has not been chosen to undertake the inspections, compliance certificates will need to be submitted to Council at each of those stages.

20. Occupation Certificate Fee

The Council's fee for the issue of an Occupation Certificate for minor residential works (i.e. single dwellings & related buildings) and low-scale commercial/industrial works is incorporated into the inspection fees. In instances where insufficient inspection fees have been paid (i.e. due to the need for re-inspections etc) you will be charged prior to Council issuing the Occupation Certificate/carrying out a final inspection.

Application Fees - Office Use Only			
DEVELOPMENT	$	OCCUPATION	$
CONSTRUCTION	$	SUBDIVISION	$
ADVERTISING	$	LONG SERVICE LEVY	$
INSPECTION	$		$
TOTAL $			

lodgement of applications and further enquires please contact Council's Customer Services Unit
Ground Floor - 30 Darcy Street, Parramatta
(Business Hours 8.30am – 4.30pm Monday to Friday and 9.00am – 12.30pm Saturday)
Parramatta City Council, PO Box 32, NSW 2124 or DX 8279 Parramatta
Telephone: 9806 5000, Fax: 9806 5900
Visit our website – www.parracity.nsw.gov.au

CHECKLIST – MINOR APPLICATIONS

(Suitable for single dwellings & associated buildings, minor industrial & commercial works, advertising structures, demolition)

☑ Where requirement is satisfied or circle N/A where relevant DA No. 1345/00

APPLICATION FORM

1. The application form is completed and signed by the applicant ☑
2. The applicant is not the owner, and owner's consent has been obtained. ☐ - N/A

PLAN REQUIREMENTS

3. The applicant has provided plans, specifications and other information as required under the "Submission Requirements" of the application form relevant for the proposal. ☑
4. All trees to be removed are shown on the plan and the applicant has been given a Tree Removal Application Form. ☐ - N/A

SITE REQUIREMENTS

5. The site is flood prone and the plans indicate contour levels to AHD ☐ - N/A
6. The site is located in a "grey-hatched" area and O.S.D details have been provided. ☐ - N/A
7. The site is affected by an easement, right-of-carriageway or other forms of restrictions which are clearly notated/shown on the plans. ☐ - N/A
8. The site is contaminated and a contamination report has been submitted. ☐ - N/A
9. The property is a heritage item, in a conservation area or is demolition restricted and a heritage impact statement has been submitted. ☐ - N/A

ADDITIONAL REQUIREMENTS

10. Stormwater concept plan is required in accordance with Council's policy and has been provided. ☐ - N/A
11. A "Statement of Environmental Effects" has been provided ☐ - N/A

CONSTRUCTION CERTIFICATE REQUIREMENTS ☐ - N/A

12. The specifications (and/or plans) provide:-
    (a) If a standard booklet specification has been used all parts been completed and selections nominated ☐ - N/A
    (b) A reference to the standard (by specific materials and sizes or to a nominated reference) of construction to be utilised in regard to (where relevant) ☐ - N/A

Please✓ if relevant

☐	Drainage	☐	Footings and Slabs	☐	Brickwork
☐	Framing	☐	Roof & Wall Cladding	☐	Glazing
☐	Wet Areas	☐	Ventilation	☐	Sound Insulation
☐	Fire & Smoke Alarms	☐	Fire Safety Measures		

13. The applicant has been given the opportunity to nominate Council as the PCA, to issue an Occupation Certificate and make payment of the necessary fees. ☐ - N/A

FEES

14. The applicant has been given the opportunity to make payment of the Long Service Leave Levy, inspection fees and Occupation certificate application fee. ☐ - N/A

FEEDBACK

Application Accepted By VSTOICS Date 7/9/00

Development Application Processing Sheet		Date Prepared:	21-Nov-2005
DA No.:	DA/1153/2005	**Related Application:**	
Property:	LOT 2 DP 18872 Parramatta East Public School 61 Albert St, East Nth Parramatta ~~Parra East Public Sc, 30 Brabyn Street, PARRAMATTA NSW 2150~~		
Applicant:	Mr S Connelly	**Owner:**	Department Of School Education
Zoning:	Special Uses 5		

Check following Information (Insert " X "):		**Check if any Issues** (Insert " X "):	
Locality Plan			Permissibility
	Locality Plan is satisfactory/unsatisfactory		SEPP 1 - Variations
	Surrounding land details must be confirmed		SEPP 55 - Contaminated Land
DA Form			SEPP 63 - Major Transport Projects
X	DA form is satisfactory		SEPP 64 - Signage
Applicant must confirm:			SEPP 65 - Design of RFBs
	Type of application		SEPP 66
	Development Description		FSR
	Owners Consent		Siting & Design / integration / streetscape
	All fees have been paid		External Appearance / height / bulk / scale
	Estimated cost of development to be reviewed		Building line / side / rear setback
Plans			Privacy / overlooking
X	Plans are satisfactory/unsatisfactory		Overshadowing / Solar access
	Need full floor plans/elevations /sections		Disabled access
	Additional copies needed		Environmental Performance / Energy Efficiency
	Coloured set needed		Access / Traffic / Parking/ AS 2890.1
	A4 Copies needed		Drainage / Flooding
Statement of Environmental Effects			Heritage
X	SEE is satisfactory/unsatisfactory		Fencing
Pre-lodgement Meeting			Safety & Security by design
	Obtain pre-lodgement notes		Building materials, finishes & colours
			Soft soil zones
Next Step:			Tree removal protection / retention
	Site Inspection		Waste Management

Other Issues:	

Additional Information is Required: *(Circle appropriate response*	**"Awaiting Additional Information":** *(Circle appropriate response)*
Yes "Stop the Clock" *(refer to ⇩ & ⇔)* / **No**	**Send out Notification/Advertising: Yes / No**
	Send out Referrals to Stakeholders: Yes / No

Request Additional Information:	
***(Insert Paragraph Numbers to place in Letter)*:**	
	Owners Consent: 1 2 3
	Estimated Cost of Development: 4 5 6
	Advertising Fees: 7 8 9
	Strata Subdivision Fees: 10
	Statement of Environmental Effects: 11 12
	Survey Plan: 13 14 15 16 17 18
	Additional Plans: 19 20 21 22 23 24 25 26 27 28
	Additional Dimensions Required: 30 31 32 33
	Shadow Diagrams: 35 36 37 38
	Plans Providing Calculations: 39 40 41
	SEPP No. 1 Objection: 43 44 45 46 47 48 49
	Drainage: 52 53 OSD 54
	Integrated Development: 55 56 74
	Trees/Landscaping: 64 65 66 67
	Traffic/Parking: 68
	Waste Management: 69
	Soft Soil Zone: 70 71
	Overshadowing: 72 73
	Privacy & Overlooking: 76
	BASIX Certificate: 79
	SEPP 65 requirements
	Heritage Impact Statements
	Contamination

Notify *(Circle appropriate response)*		
Advertisement in Local Newspaper	Yes / No	
Advertise in Sydney Morning Herald	Yes / No	
Sign to be placed on site	Yes / No	
Letters to Adjoining Owners	(Yes) / No	
Number of Days:	14	
Notification Period:	From:	1/12/05
	To:	15/12/05

Internal Stakeholders Attending Clearing House	
* Building Surveyor - is a referral required?	Yes / (No)
BCA Class: 10a Refer to memo	
Signature:	
* Drainage Engineer - is a referral required?	Yes / (No)
Signature: RZolo	
* Landscape Officer - is a referral required?	Yes / (No)
Signature:	

Internal Referrals *(Insert " X ", Circle appropriate response & signature):*	**Sent**	**Rec.d**
Building Surveyor		
Drainage Engineer		
Landscape Officer		
Urban Designer		
Heritage Officer		
Environ. & Health Survey.		
Waste Management		
Traffic		
Infrastructure		
Outcomes/Place Manager		
Outcomes/Public Art Officer		
Open Space & Recreation		
Community Services		
Property Officer		
Bushland Management		
Design Review Panel (SEP65)		
Other:		

External Referrals *(Insert " X "):*	**Sent**	**Rec.d**
DIPNR (Integrated / Other)		
Heritage Office (Integrat./SREP/ LEP)		
Police (Crime Prev. / Liquor License)		
RTA (Integrated / SEP11 / Other)		
Waterways Authority		
National Parkes & Wildlife Services		
Other:		

DA Allocated to: Carine	Date of Clearing House Meeting:
Team Leader Signature: Brad	22 / 11 / 2005

NON COMBUSTABLE SHADE CLOTH OR EQUIVALENT.

8968

Our Reference: DA/1153/2005
Contact: Sophia Chin
Telephone: 9806 5000
Fax: 9806 5917

Mr S Connelly
30 Brabyn Street

PARRAMATTA NSW 2150

25 January 2006

DEVELOPMENT APPLICATION
NOTICE OF DETERMINATION

Issued under the Environmental Planning and Assessment Act 1979
Sections 80, 80A & 81 (1)(a)

Development Consent No:	DA/1153/2005
Property Address:	Lot 1 Sec 59 DP 758788, Lot 2 Sec 59 DP 758788, Parra East Public Sc, 61 Albert Street East, NTH PARRAMATTA NSW 2151
Description:	Construction of shade structure over children's playground in school grounds
Determination:	**APPROVED SUBJECT TO CONDITIONS**
Determination Date:	25 January 2006
Consent to Operate From:	25 January 2006
Consent to Lapse On:	25 January 2011

You are advised that your application has been **APPROVED** subject to the following conditions:

General Matters:

1. The development is to be carried out in compliance with the following plans and documentation listed below and endorsed with Council's stamp, except where amended by other conditions of this consent:

Online, anytime! *Log on to www.parracity.nsw.gov.au to track progress of development applications, construction certificates and complying development certificates lodged from 1 July 2005.*

ONLINE APPLICATION TRACKING

Drawing N°	Dated
3840 – Parramatta East Public School Site Plan Scale 1:900	Undated
Shade Frame Diagram	Undated

No construction works (including excavation) shall be undertaken prior to the release to the Construction Certificate.

Note: Further information on Construction Certificates can be obtained by contacting Customer Service on 9806 5518.

Reason: To ensure the work is carried out in accordance with the approved plans.

2. All building work must be carried out in accordance with the provisions of the Building Code of Australia.

Reason: To comply with the Environmental Planning and Assessment Act 1979, as amended and Environmental Planning and Assessment Regulation 2000.

Prior to Work Commencing:

3. The site must be enclosed with a suitable security fence to prohibit unauthorised access, to be approved by the Principal Certifying Authority. No building work is to commence until the fence is erected.

Reason: To ensure public safety.

4. Prior to work commencing, toilet facilities are to be provided, at the work site on which work involved in the erection or demolition of a building is being carried out, at the rate of one toilet for every 20 persons or part of 20 person employed at the site.

Reason: To ensure adequate toilet facilities are provided.

5. Erosion and sediment control devices are to be installed prior to the commencement of any demolition, excavation or construction works upon the site. These devices are to be maintained throughout the entire demolition, excavation and construction phases of the development and for a minimum three (3) month period after the completion of the project, where necessary.

Reason: To ensure soil and water management controls are in place before site works commence.

During Work:

6. Building work may only be carried out six (6) days a week, Monday to Friday between the hours of 7.00am to 8.00pm and Saturday 8.00am to 8.00pm. No work is permitted to be carried out on Sundays or Public Holidays.
   Reason: To protect the amenity of the area.

7. Noise from construction and/or demolition activities associated with the development shall comply with the NSW Environment Protection Authority's Environmental Noise Manual and the Protection of the Environment Operations Act 1997.
   Reason: To protect the amenity of the area.

Right of Appeal:

If you are dissatisfied with this decision, Section 97 of the Environmental Planning and Assessment Act 1979 gives you the right to appeal to the Land and Environment Court within 12 months after the date on which you receive this notice.

Section 82A of the Environmental Planning and Assessment Act 1979 provides that the applicant may request the Council to Review the determination. The request must be made in writing (or on the review application form) within twelve (12) months after the decision date, as specified in this notice of determination, together with payment of the appropriate fee.

Yours sincerely

Sophia Chin
Development Assessment Officer
Development Assessment Services

8949

Parramatta City Council	
L	
File No:	DA/1153/2005

DEVELOPMENT APPLICATION ASSESSMENT TEAM

ASSESSMENT CHECKLIST – DECKS, PERGOLAS, CARPORTS, GARAGES & OTHER ANCILLARY STRUCTURES

Section 79C, Environmental Planning & Assessment Act, 1979.

Address:	**Lot 2 DP 18872 Parramatta East Public School** **61 Albert Street East, North Parramatta.**
Description of Proposal:	**Construction of shade structure over children's playground in school grounds.** The application seeks approval for the construction of a shade structure over an existing children's playground within the school grounds of Parramatta East Public School. The proposed shade structure is to have the dimensions of 10.0m x 10.5m and be made with a dark green commercial grade shade cloth. The minimum height of the shade structure would be 3.5m. It is noted that this application falls under the requirements of Crown Land under Section 116C of the Environmental Planning and Assessment Act 1979. Conditions of consent have had written concurrence from applicant and Principal of Parramatta East Public School, Mr. S. Connolly has been received by Council through fax dated 23/1/2006.

Site Inspection: an inspection of the site was undertaken on Thursday 13 January 2006.

1. Submitted Information

Item	Supplied			Comments
	Yes	No	N/A	
Consent from all owners	✓			
Contamination Report			✓	
ESCP			✓	
Heritage Impact Statement			✓	
Landscaping Plan			✓	
NatHERS			✓	
Full plans/ elevations	✓			
A4 reduced plans	✓			
Shadow Diagrams			✓	
Site Analysis			✓	
Site Stormwater Management Plan	✓			
Statement of Environmental Effects	✓			
Statement of Flora and Fauna Impact			✓	
Subdivision Plan			✓	
Survey Plan			✓	

Waste Management Plan	✓			
Other (specify)			✓	

2. Statutory Requirements *[S.79C(1)(a)]*

Planning Instruments:	LEP2001	**Zoning:**	Special Uses 5
Draft Instruments:	N/A	**Draft Zoning:**	N/A
DCP:	DCP2001	**BCA Class:**	10a

(a) PLEP 2001 Compliance:

Clause		Compliance			Comments
		Yes	No	N/A	
Part 1	LEP Objectives satisfied?	✓			
Cl 16	Permissible within Zone?	✓			
Cl 21	Is the site flood affected? If yes will the development satisfy Cl 2 (a)-(e)? **No**			✓	
Cl 22	Have contamination issues been adequately addressed? (See below)			✓	
Cl 24 Cl 25	Is the site a brothel or restricted premises?			✓	
Cl 31 Cl 32	Is the site adjacent to the Parramatta River foreshore or affected by a Foreshore Building Line?			✓	
Cl 34	Will the proposal have any impact on Acid Sulfate Soils? Has sufficient information been submitted?			✓	
Cl 39	Maximum height of 2 stories?	✓			
Cl 40	Maximum FSR: • dwelling 0.5:1 • dual occ 0.6:1 • terrace / multi-unit 0.6:1 • RFB 0.8:1 • High density housing NB 0.8:1 for terraces in certain areas			✓	
Any other relevant provisions?				✓	

(b) DCP 2001 Compliance:

Clause		Compliance			Comments
		Yes	No	N/A	
4.1.1	Is the energy performance satisfactory? (Consider HWS, insulation, shading, solar orientation, hot water system, ventilation, water efficiency)	✓			The proposed shade structure will provide appropriate shading for the existing playground equipment.
	Does the proposal maintain a min of 3 hrs solar access to habitable rooms between 9am and 3pm daily?			✓	
	Does the proposal ensure that adjoining properties receive a min of 3 hrs sunlight to habitable rooms to 50% of the private open space between 9am and 3pm on 21 June?			✓	
4.1.2	Is waste management satisfactory? (Consider WMP, materials, on-site waste	✓			

	management)				
4.1.3	Is the site flood affected/ Grey Area? Is stormwater drainage satisfactory?			✓	The proposed shade structure is permeable and will not alter or impede on existing drainage flows.
	Is on-site water management satisfactory? Will the proposal impact on Acid Sulfate Soils?			✓ ✓	
4.1.4	Are the proposed erosion control measures satisfactory?	✓			
4.1.5	Is the site affected or likely to be affected by contamination? (see checklist below)			✓	
4.1.6	Will the proposal impact on biodiversity or Threatened Species or require removal of remnant vegetation?			✓	
4.1.7	Does the proposal maximise soft soil/ landscaping & minimise hard surfaces? (4m x 4m soft soil zone)			✓	The development does not increase the impervious areas on the site, therefore is not applicable to this DA.
	Does the proposal maintain or enhance the existing landscape setting?	✓			
Clause		**Compliance**			**Comments**
		Yes	**No**	**N/A**	
	Does the proposal retain significant site features eg rock outcrops/ retain trees & mature vegetation? Does the proposal minimise overlooking/ maximise privacy?	 ✓		✓	
4.2	Will the proposal assist in the provision of housing diversity & choice? Will the proposal have any adverse social or cultural impacts?			✓ ✓	
4.3.1	Does the proposal minimise noise & reduce the exposure to noise sources (eg main roads)			✓	
4.3.2	Does the proposal incorporate safety by design principals where relevant?			✓	
4.3.3	Is disabled access satisfactory?			✓	
4.3.5	Is adequate carparking provided to meet demand generated? (1 space GFA 125m² or less) (2 spaces GFA 125m² or more) Does the proposal allow adequate vehicular access & egress? Is the garage/ car port behind the building line? 4 m² storage space extra to garage provided? Is the carport/ garage visually dominating? (6.3m max. width or 50% of width of dwelling – whichever is less)			✓	
4.3.6	Will the proposal affect any existing views? (Consider designated view corridors)			✓	
4.4.1	Does the proposal maintain the street alignment? Will the proposal "fit" into the streetscape? Is it appropriately sited?			✓ ✓	

	Min. side setback is 900mm unless there is an existing encroachment (subject to compliance with the BCA)? Corner sites, the setback on the secondary street frontage is a min. of 3 metres unless it is an extension of the existing wall? Is the rear setback 30 % of the site's length or consistent with the established rear setback of the street block (the rear setback is measured to the wall of the rear elevation)? Ancillary structure, excluding habitable rooms, are permitted within the rear setback Are fences consistent with surrounding streetscape? Max. fence height 1.2m if solid or 1.8m open. Are the fence materials satisfactory? Prefer metal or timber palisade & masonry.			✓ ✓	
4.4.2	Is the bulk, height & scale of the proposal satisfactory? Does it fit into the existing built form? Max FSR as per Cl. 40 of PLEP?	✓			
Clause		**Compliance**			**Comments**
		Yes	**No**	**N/A**	
4.4.3	Is the external appearance of the building satisfactory? Consider modulation, openings, fenestrations.			✓	
4.4.4	Do the materials & colour schemes fit with the surrounding area?	✓			The proposed shade structure is to be made of commercial grade shade cloth in a dark green colour. It is considered this will fit into the surrounding area.
4.4.5	Min. window head height consistent with rest of house? Does proposal allow adequate cross ventilation? Does the proposal allow adequate solar access into habitable rooms?			✓	
4.4.6	Does the proposal provide/ maintain a min. of 100 m² private open space (min. 6m x 6m)? Does the proposal maintain a soft soil zone? (30% of site area – or consistent with street block) Is the open space directly accessible from living areas? Do open space areas receive adequate solar access?			✓	
4.5	Is the site a Heritage item or within a Conservation Area? **No** Has a suitable Heritage Impact Statement been submitted? Will the proposal have an adverse impact on the heritage significance of the Item or on any nearby heritage items or Conservation Area?			✓	The site is not a heritage item of within a Heritage Conservation Area.
4.6	Is the site within a Special Character Area? **No** Is the proposal consistent with the controls in Appendix 7 of the DCP? Is the proposal within a Neighbourhood Character Area?			✓	

Is the proposal consistent with the controls in Appendix 8 of the DCP?				

3. Comments on the Likely Impact of the Development *[Section 79C(1)(b)]*

Conclusion
Having regard to the above matters, will the proposal have any significant adverse impacts including environmental impacts on both the surrounding built & natural environments and social and economic impacts in the locality? How have effects been controlled during construction and in the design of the proposal?
The proposed shade structure to cover the existing children's playground will not adversely impact existing vegetation and built forms. The shade structure does not require the removal of any vegetation or demolition of any built form. The shade structure will have no adverse social and economic impacts in the locality as the structure will enhance the level of amenity to school children using the playground. The effects of the shade structure are considered to be controlled through owner consent for the appropriate waste management and the appropriate design and location of the shade structure over the existing children's playground.

4. Suitability of the site for the development *[S.79C(1)(c)]*

(a) Suitability:

Matter for consideration
Does the proposal integrate into the locality? Is the proposal appropriate for the site?
The proposed shade structure integrates into the locality causing no adverse impact on the local amenity. It is considered that appropriate material and colour choice of the shade structure integrates with the existing environment. The shade structure is ancillary to the school built structures and is appropriate for the site.

(b) Contaminated Land:

Circumstance	Notes
1. Does the application involve re-development of the site?	**No** - Change of Use/ Minor works
2. In the development going to be used for a sensitive landuse eg: residential, educational, recreational, childcare or hospital-land?	**Yes** Existing dwelling with a history of residential use - no evidence of contamination.
Circumstance	**Notes**
3. Does information available to you indicate that an activity such as/or similar to those listed in Table 1 has ever been approved, or occurred at the site. Can be answered by i**nspecting site**, reviewing information on DA or checking the database.	**No**
4. Is the site listed on Council's database? If "yes", consider issues such as: • Table 1 and similar activities • EPA restrictions on site eg: investigation order • Pollution incidents or illegal dumping • Adjoins site which is contaminated • Remediated/Investigated without sufficient information relating to level of contamination.	**No**
5. Based on your answers to the above, do you consider that a preliminary site audit statement is warranted?	**NO** - preliminary investigation not required

5. Public Interest *[S.79C(1)(d) & (e)]*

Notification/Advertisement			
Advertised (newspaper) ❑	Mail ☑	Sign ❑	Not Required ❑

The application was notified between 1 December 2005 to 15 December 2005. One (1) submission was received in response to the neighbour notification. TRIM was last checked 13/01/06.

One (1) submission has been lodged by Trever J. Crisell of 5/27-29 Brabyn Street, North Parramatta. The letter raises no objection or direct relevance to the development application, but Mr Crisell has chosen the opportunity to inform Council of a possible unapproved structure hazardous to the school children. The letter has been referred to Council's Compliance Section on 5 January 2006.

Have amended plans been submitted since the original application was made?	**No**

6. Recommendation

With the written concurrence from the applicant on behalf of NSW Department of Education and Training, the application is approved subject to the following conditions of consent:

A0001 Approved Plans and Supporting Documentation
The development is to be carried out in compliance with the following plans and documentation listed below and endorsed with Council's stamp, except where amended by other conditions of this consent:

Drawing N°	**Dated**
3840 – Parramatta East Public School Site Plan Scale 1:900	Undated
Shade Frame diagram	Undated

Reason: To ensure the work is carried out in accordance with the approved plans.

A0002 Building work in compliance with BCA
All building work must be carried out in accordance with the provisions of the Building Code of Australia.
Reason: To comply with the Environmental Planning and Assessment Act 1979, as amended and Environmental Planning and Assessment Regulation 2000.

C0010 Enclosure of the Site
The site must be enclosed with a suitable security fence to prohibit unauthorised access, to be approved by the Principal Certifying Authority. No building work is to commence until the fence is erected.
Reason: To ensure public safety.

C0041 Toilet facilities on-site
Prior to work commencing, toilet facilities are to be provided, at the work site on which work involved in the erection or demolition of a building is being carried out, at the rate of one toilet for every 20 persons or part of 20 person employed at the site.
Reason: To ensure adequate toilet facilities are provided.

C0071 Erosion & Sediment Control Measures
Erosion and sediment control devices are to be installed prior to the commencement of any demolition, excavation or construction works upon the site. These devices are to be maintained throughout the entire demolition, excavation and construction phases of the development and for a minimum three (3) month period after the completion of the project, where necessary.
Reason: To ensure soil and water management controls are in place be site works commence.

D0001 Building Work Hours

Building work may only be carried out six (6) days a week, Monday to Friday between the hours of 7.00am to 8.00pm and Saturday 8.00am to 8.00pm. No work is permitted to be carried out on Sundays or Public Holidays.

Reason: To protect the amenity of the area.

D0020 Construction Noise

Noise from construction and/or demolition activities associated with the development shall comply with the NSW Environment Protection Authority's Environmental Noise Manual and the Protection of the Environment Operations Act 1997.

Reason: To protect the amenity of the area.

Delegated Authority No: PB002

Report prepared by: **Name: Sophia Chin** **Signature:** **Town Planner**	**Date:** 24 January 2006
I have read the S79C assessment worksheet and endorse the manner in which the development application has been assessed. I concur with the recommendation and determine this application under **Delegated Authority No. PB 002** **I authorise the Town Planner whose name appears above to sign all plans and paperwork in relation to this determination.** **Name: Brad Delapierre, Team Leader** **Signature:** **Peer Reviewer**	**Date:** 25/1/06

Peer Review of Development Application

DA Number: 1153/2005

Property Address: 61 ALBERT ST EAST NORTH PARRAMATTA

- [x] All DA fees paid.
- [x] Consent of all owners provided.
- [x] DA notified in accordance with Council's Notifications DCP.
- [x] Acknowledgement letters sent to all persons who lodged submissions.
- [x] All issues raised in submissions have been considered in the assessment of the application.
- [x] Comments from stakeholders considered in assessment of application.
- [x] Relevant matters for consideration (s79C assessment) addressed in report.
- [ ] NA Section 94 Contributions calculated (if required).
- [x] Standard conditions of consent and extraordinary conditions or reasons for refusal prepared.
- [ ] NA Letters responding to objectors prepared.

Application peer reviewed by: Brad Delapierre BD

Dated: 25/1/06

Steel frame (typical)

6m x 10.5m

3.5m min. height

Taylor made

$8,800 or

$9,900

PARRAMATTA CITY COUNCIL

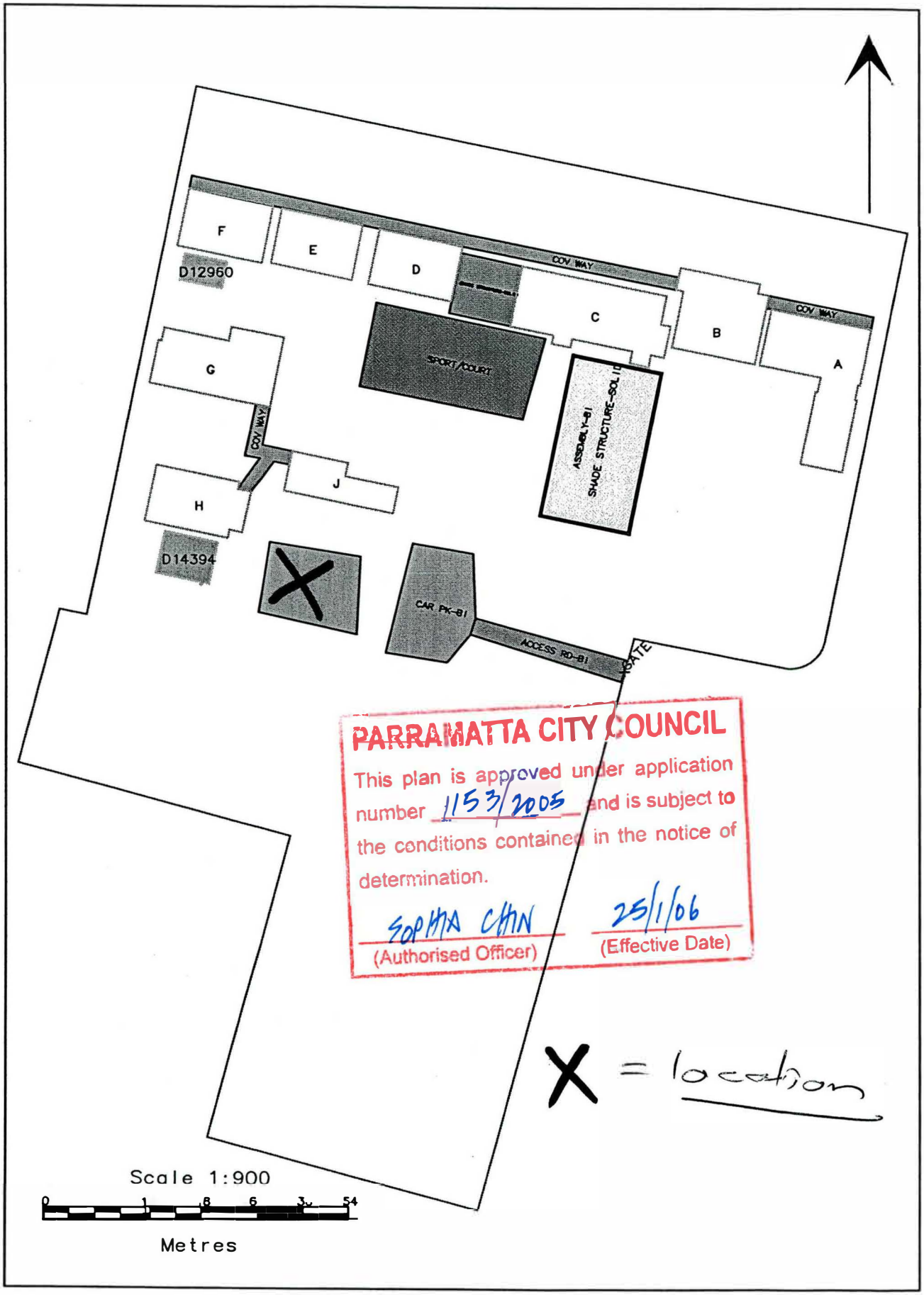
This plan is approved under application number 1153/2005 and is subject to the conditions contained in the notice of determination.

SOPHIA CHIN (Authorised Officer)

25/1/06 (Effective Date)

3840 – Parramatta East Public School

Site Plan (11583)



Parramatta East Public School

Brabyn Street, Parramatta NSW 2150.
Telephone (02) 9630 2127 & (02) 9630 3743
FAX: (02) 9683 5942
Email: parramatte-p.school@det.nsw.edu.au

3 ~~pages~~. fax 9890 3156

To: SOPHIE CHIN ~~Jones/Keenan~~	Date: 23-1-06
Re: DA.1153/2005	From: Steve Connelly

I accept the conditions of DA/1153/2005 on behalf of the NSW Dept. of Education & Training as site manager of this school.

S. Connelly
PRINCIPAL

23/1/06

Statement of Environmental Effects

Incorporating Erosion and Sediment Control, Site Stormwater Concept Plan and Waste Management Plan

The following *Statement of Environmental Effects* (SEE) explains the likely impacts of the proposal and how these impacts will be minimised. It addresses the
a) the environmental impacts of the development
b) how the environmental impacts of the development have been identified.
c) the steps to be taken to protect the environment or to lessen the expected harm to the environment.

Project Location:	Parramatta East Public School Brabyn Street, Paramatta
Project Description:	Erection of a 10 metre by 10.5 metre shade structure over an existing children's playground

A. Site and Context Suitability

A Site plan has been attached. The following issues have been considered in assessing the suitability for the proposed structure:

- The proposed structure is to go over an existing play ground.
- Site constraints such as slope, flooding, bushfire hazard and acid sulphate soils do not affect this site
- The proposed structure is located on school grounds and is compatibility with land zoning
- The structure is not within the vicinity of the property boundary
- The posts have been positioned outside the required playground fall zones
- The design is not accessible directly from any part of the playground equipment

B. Design Guidelines

The proposed shade structure will utilise finishes and fixtures that are unobtrusive. This includes the use of commercial grade shade cloth in a dark green to blend in with the surrounding area.

The Structure will not impact on the surrounding streetscape and is within the existing local context and building character.

C. Access and Traffic

The proposed structure will NOT generate any traffic

There is adequate provision for access to the playground

The proposed structure will not impede access in accordance with the Disability Discrimination Act.

D. Privacy, views and sunlight

The proposed structure will not impact any neighbouring privacy, views and sunlight access. The structure is over an existing playground that is located over 50 metres from the nearest adjacent property.

E. Air and noise

The proposed structure will not cause, or be affected by, air or noise emissions once completed.

In the erection of the structure some minor noise may occur from power tools however this will be limited to period of installation.

F. Drainage – Site Stormwater Concept Plan

The proposed structure will not impede or alter any drainage flows. The shade structure is permeable to water and will not concentrate or channel water. There will be no connections to the stormwater system.

G. Erosion & Sediment Control

During installation 4 holes will be dug. All soil will be immediately removed from the site. No specific temporary sediment controls will be required.

There will be no impact on adjacent land and waterways

H. Heritage Impact Assessment

A Heritage Impact Assessment is not required as the proposed site is not within a Conservation Area or heritage item

I. Waste – Waste Management Plan

The structure is prefabricated and delivered to site. As a result there is no waste material produced and no need for any form of waste separation, recycling or disposal.

There is no existing structure to be removed.

J. Site Management

Construction will be managed to ensure public safety and to minimise public inconvenience. Access will be restricted during installation.

There will be no storage of building materials, equipment, bulk waste containers or other materials stockpiles

Schedule to application for a construction certificate

Please complete this schedule. The information will be sent to the Australian Bureau of Statistics.

All new buildings

Please complete the following:

- Number of storeys (including underground floors) — ~
- Gross floor area of new building (m²) — 94.5
- Gross site area (m²) — 94.5

Residential buildings only

Please complete the following details on residential structures:

- Number of dwellings to be constructed
- Number of pre-existing dwellings on site
- Number of dwellings to be demolished
- Will the new dwelling(s) be attached to other new buildings? Yes ☐ No ☐
- Will the new building(s) be attached to existing buildings? Yes ☐ No ☐
- Does the site contain a dual occupancy? (NB dual occupancy = two dwellings on the same site) Yes ☐ No ☐

Materials – residential buildings

Please indicate the materials to be used in the construction of the new building(s):

Walls		Code	Roof		Code	Floor		Code	Frame		Code
Brick (double)	☐	11	Tiles	☐	10	Concrete or slate	☐	20	Timber	☐	40
Brick (veneer)	☐	12	Concrete or slate	☐	20	Timber	☐	40	Steel	☐	60
Concrete or stone	☐	20	Fibre cement	☐	30	Other	☐	80	Aluminium	☐	70
Fibre cement	☐	30	Steel	☐	60	Not specified	☐	90	Other	☐	80
Timber	☐	40	Aluminium	☐	70				Not specified	☐	90
Curtain glass	☐	50	Other	☑	80						
Steel	☐	60	Not specified	☐	90						
Aluminium	☐	70									
Other	☐	80									
Not specified	☐	90									

DEVELOPMENT APPLICATION CHECKLIST

ANCILLARY STRUCTURES

Awnings, Pergolas, Carports, Sheds, Fences, Patios's, Decks.

<INTERNAL>

MANDATORY LODGEMENT REQUIREMENTS			
DESCRIPTION	**NOTES**	**Copies Required**	**Submitted**
Application Form & Consent of Owners	Correctly completed - with applicants details & signatures of **ALL** owners.	1	✓
A4 Notification Plans	Site plan & elevations reduced to A4 size	8	✓
Architectural Plans / Site Plan	Full drawings of development - (1:100 Scale / 1:200)	8	✓
CD ROM	All plans & all docs. on CD ROM, Please refer to **"CD ROM Reqirements"** for more detail.	1	Council
Correct Fee	In accordance with Councils schedule of fees	1	✓
Site Stormwater Concept Plan	Showing method of stormwater management	8	N/A
Statement of Environmental Effects	Full description & an assessment of the potential environmental impact of the proposal	8	✓
NON - MANDATORY LODGEMENT REQUIREMENTS			
Aboriginal Archaeological Statement	For "High & Medium" sensitivity sites	8	N/A
Australian Bureau of Statistics	If application includes Construction Certificate	4	N/A
Building Specifications (If App Inc C.C.)	Detailed specifications of structure in accordance with Building Code of Australia (BCA) No. CC Reqd.	4	✓
Erosion and Sediment Control	Where soil is disturbed - Indicated on plans	8	S.E.E
External Finishes and Materials	Samples Required / Colour Charts etc.	8	✓
Heritage Impact Statement	If Heritage Item or in a Conservation Area - See Heritage LEP/DCP www.parracity.nsw.gov.au	8	N/A
Waste Management Plan	Required For All Applications - See appendix (3) DCP 2001	8	✓
Acknowledgement Letter Issued			

YES ☐ NO ☐

ACCEPTED BY: ALAN MIDDLEMISS DATE: 17/11/2005

APPLICANTS SIGNATURE: ..... DATE: .....

PARRAMATTA CITY COUNCIL

PCC Scanning Fees—2005/2006

Application Scanning Fee Details

1. Application Details

Application Address: 30 Brabyn St

suburb: Parramatta postcode:

Application Number: DA/ 1153/05

2. Value of Works

Estimated Value of Works	Fee $ Inc GST	Tick Box
0-$300K	$30.00	✓
$301K - $900K	$90.00	
$901K+	$180.00	

3. Receipt Details

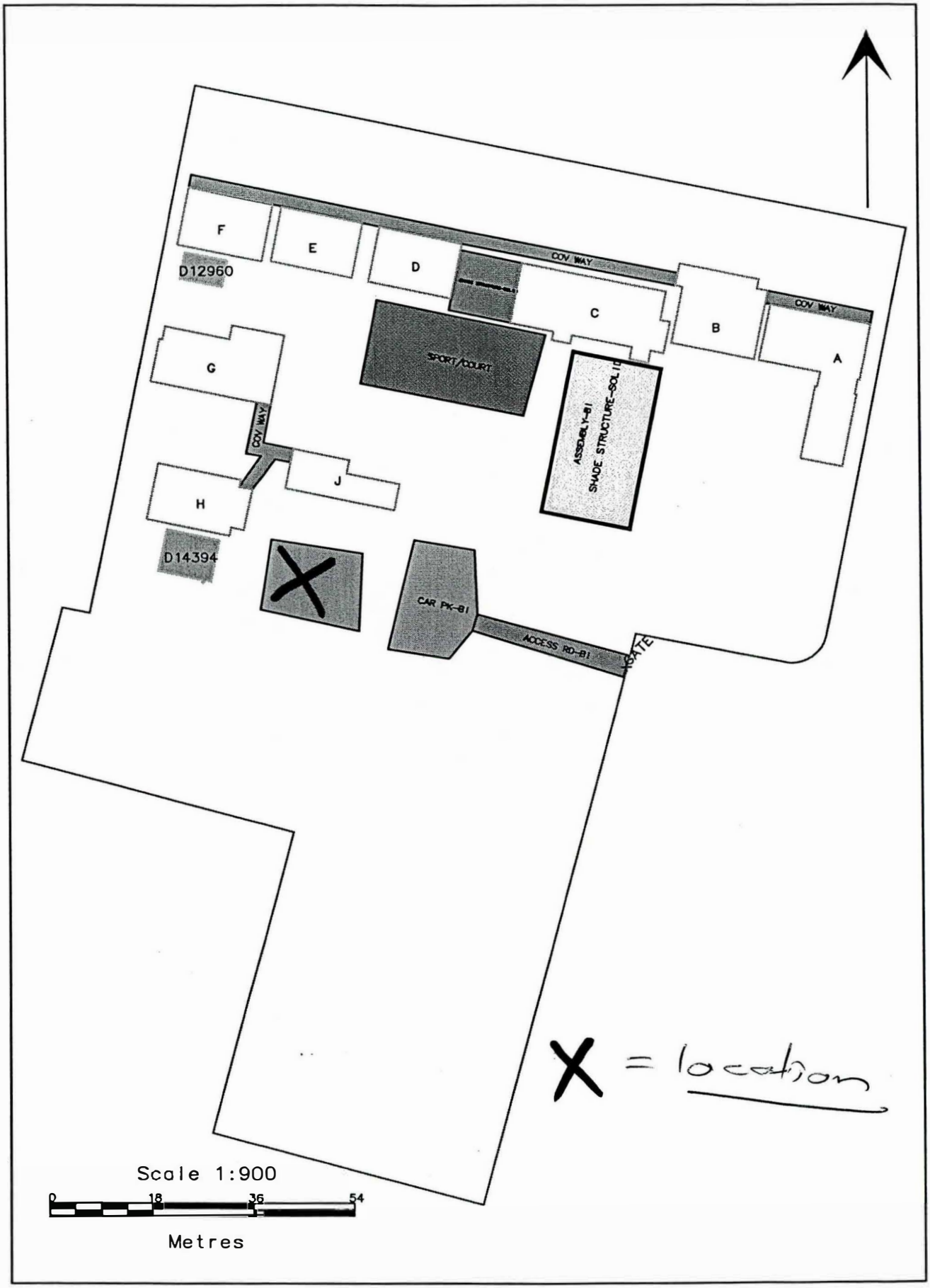
Receipt Number

Date: 17/11/05

From 1 July 2005, you can log onto www.parracity.nsw.gov.au to track the progress of your application.
The information you supply on this form and any related documentation will be publicly available on Council's website..

3840 – Parramatta East Public School

Site Plan (11583)



PARRAMATTA CITY COUNCIL

Environmental Planning and Assessment Act Application

FOR OFFICE USE ONLY

No. DA 1153/05
Letter Reference
Receipt No. 216355
Date 17.11.05

DEVELOPMENT CONSENT, CONSTRUCTION CERTIFICATE and/or OTHER APPLICATIONS

TYPES OF CONSENT, CERTIFICATE OR APPROVAL REQUIRED (See Notes) Tick ☐ as applicable

- ☑ Development Consent
- ☐ Tree Removal Only
- ☐ Integrated Development Approval
- ☐ Modification (Section 96) of Development Consent
- ☐ Other Approval under S68 of the Local Govt Act 1993
- ☑ Construction Certificate.
- ☑ Appoint Council as Principal Certifying Authority.
- ☑ Occupation Certificate ☐ Interim ☐ Final
- ☐ Subdivision Certificate and Linen Release.
- ☐ Modification to Construction Certificate

COMBINED APPLICATIONS

- ☐ Complying Development Certificate and Occupation Certificate and appoint Council as Principal Certifying Authority.
- ☐ Combine Development Modification (Section 96) and Modification to Construction Certificate.
- ☐ Construction Certificate and Occupation Certificate and appoint Council as Principal Certifying Authority.

Description of Property

Street No.	Street	Suburb
	Brabyn st	Parramatta
Lot	**Section**	**DP/SP**
1	59	758788

Description of Proposal Indicate if more than one aspect of development is proposed or if deferred commencement or staged development sought.
(e.g. use of land/building, erection of building, subdivision of land, demolition)

Erection of shade structure over childrens playground in school grounds

Cost of Development (where building/demolition work is involved) $ 9,000
Contract price or genuine estimated value of proposed work

If this application is for a **Construction Certificate**, please specify the following materials and floor area for the new or additional work

External Walls	Frame	Roof	Floor	Floor Area
-	Gal posts	shade cloth	-	94.5 m2

Applicant Connelly, Steven

Surname	Given Names
parramatta-p.school@det.nsw.edu.au	
E-mail Address	
Postal Address	
parramatta East Public School Brabyn St, parramatta 2150	
Suburb	Daytime Phone and Fax Number
	9630 2127
Signature	Date
	23/9/05

Builder (if applicable and known)

Surname	Given Names
E-mail Address	
Postal Address	
Suburb	Daytime Phone and Fax Number
Builder/Owner-Builder Licence Permit No.	

Consent of Owner – (All owners must sign) If insufficient space, attach a separate letter

	Mr/Mrs/Miss	Surname	Given Names
Names		COLIN ISBISTER	
		REGIONAL MANAGER ASSET MANAGEMENT WESTERN SYDNEY REGION	
Postal Address	Street	Suburb	Post Code
	C/O R Mount st & North Pde	Mt Druitt NSW	2770

Signature of owner/s: [signature] Date: 26/9/05

I/We own the subject land, consent to this application and consent to Council's Officers entering the Premises during normal office hours for the purpose of conducting inspections relative to this application.

Note: In the case of a body corporate, a seal is required, or if crown land, written authorisation of the relevant statutory authority.

REF: 03962-06TFC

M^cKENZIE
GROUP CONSULTING

TRANSMITTAL FORM

To:	**Parramatta City Council**	Project No:	**03962**
Address:	**PO Box 32, Parramatta 2124**		
Attention:	**Customer Service**	Date:	**16 October 2009**
Project:	**Parramatta East Public School, Brabyn Street, Parramatta**		
From:	**Chris Bailey**		

Method of Delivery:

☐ **Mail** ☐ **Courier** ☐ **By Hand** ☐ **Collected** ✓ **DX**

Subject: **Complying Development Certificate No. 09/2479-1**

Dear Sir or Madam:

Please find enclosed one (1) copy of the Complying Development Certificate No. 09/2479-1 and it's attachment in accordance with Clause 151 (2) of the Environmental Planning & Assessment Regulation 2000, issued for the above project together with a cheque of $30.00 being the lodgement fee.

Plans and specifications approved

- Architectural drawings prepared by Suters, numbered: XXXX-A-HA-14S-1000/B, 1001/B, 1002/B, 1003/B, 1010/D, 1011/C, 1012/D, 1013/C, 1014/C, 1600/e, 1620/E, 1640/B, 1641/D, 1660/C, 1700/C, 1820/C1821/C.
- Architectural drawings prepared by Krikis Tayler Architects, numbered: 3840-A-HA-14S-1000/A, 1900/A, 1901/A, 1902/A, 1910/A, 1915/A, 1950/A, 1960/A, 1965/A.

Attachments

1. Conditions of approval (includes conditions prescribed, or required to be attached by the Regulation or relevant EPI or DCP including any condition relation to the payment of a s 94 contribution or other monetary contributions.
2. Schedule of essential fire safety measures.
3. Application form for Complying Development Certificate.
4. Record of Site Inspection made by Accredited Certifier in accordance with Clause 129B (EP&A Regulation's 2000) prior to issue of Complying Development Certificate.

RECEIVED
THE AMOUNT OF
$30—
DATE 21.10.09
REC No. 304323.

BUILDING REGULATIONS CONSULTANTS
Level 6 / 189 Kent Street Sydney New South Wales 2000
Telephone 02 8298 6800 Facsimile 02 8298 6899 email@mckenzie-group.com.au
www.mckenzie-group.com.au
Offices in Melbourne and Brisbane

CD/158/2009

5. Design Certificate in accordance with Civil Engineering prepared by Woolacotts Consulting, dated 29 July 2009.
6. Design Certificate in accordance with Structural Engineering prepared by Woolacotts Consulting, dated 29 July 2009.
7. BCA Design Statement prepared by Krikis Tayler Architects, dated 24 July 2009.
8. Design Certificate in accordance with Electrical Services prepared by Yogesh Maharaj, dated 24 July 2009.
9. Design Certificate in accordance with Fire Services prepared by Yogesh Maharaj, dated 24 July 2009.
10. Design Certificate in accordance with Mechanical Services prepared by Fredon Air, dated 24 July 2009.
11. Design Certificate in accordance with Hydraulic Services prepared by quick Contracting (NSW) Pty Ltd, dated 22 July 2009.
12. Long Service Levy Receipt.
13. Receipts of section 94A Contribution prepared by Parramatta Council, dated 20 August 2009.
14. Plans of Sheet 1, 2 & 3 prepared by Project Surveyors.
15. Site Arial Plans.
16. Civil Works drawings prepared by Woolacotts Consulting, numbered: 3840-C-HA-14s-9201/01, 9202/01, 9203/01, 9204/01.
17. Electrical Services drawings prepared by Fredon, numbered: 3840-ES-HA-14S-4000/02, 4001/01.
18. Hydraulic Services drawings prepared by Quick Plumbing, numbered: 3840-HS-HA-14S-5000/01, 5001/01.
19. Structural drawings prepared by Woolacotts Consulting, numbered: 3840-S-HA-14S-2001/A, 2002/A, 2003/A, 2004/A.
20. Sydney Water Building Plan approval, notice of requirements, dated 13 September 2009

Please provide a receipt upon completion of payment process and **note our reference.**

If you require further information please contact me on (02) 8298 6800.

Regards,

Per
Chris Bailey
Assistant Building Surveyor
McKenzie Group Consulting (NSW) Pty Ltd
ACN 093 211 995

Copy To:	Attention:	Address:
Brookfield Multiplex	**Melody Kazzi**	**Level 2, 169 Macquarie Street, Parramatta NSW 2150**

Ref: 03962-03CDC1

M◦K E N Z I E
GROUP CONSULTING

COMPLYING DEVELOPMENT CERTIFICATE No. 09/2479-1

Issued under the Environmental Planning and Assessment Act 1979 Sections 85, 85A

Owner

Name:	Cecilia Wilson
Address:	151 Clarence Street, Sydney NSW 2000

Property details

Address	Parramatta East Public School, Brabyn Street, Parramatta				
Lot/Portion No:	1 & 2	14	1 & 2	A & B	1 & 2
Section:					59
DP No:	18872	18872	794926	90685	758788
Municipality:	Parramatta City Council				

Description and value of development

Description:	14 Core Square Communal Hall & COLA
Value of work:	$1,757,222

Determination

Approved/Refused:	Approved
Date of Determination:	16 October 2009

Date of lapse

5 years from commencement date

Plans and specifications approved

- Architectural drawings prepared by Suters, numbered: XXXX-A-HA-14S-1000/B, 1001/B, 1002/B, 1003/B, 1010/D, 1011/C, 1012/D, 1013/C, 1014/C, 1600/e, 1620/E, 1640/D, 1641/D, 1660/C, 1700/C, 1820/C1821/C.
- Architectural drawings prepared by Krikis Tayler Architects, numbered: 3840-A-HA-14S-1000/A, 1900/A, 1901/A, 1902/A, 1910/A, 1915/A, 1950/A, 1960/A, 1965/A.

Attachments

1. Conditions of approval (includes conditions prescribed, or required to be attached by the Regulation or relevant EPI or DCP including any condition relation to the payment of a s 94 contribution or other monetary contributions.
2. Schedule of essential fire safety measures.
3. Application form for Complying Development Certificate.
4. Record of Site Inspection made by Accredited Certifier in accordance with Clause 129B (EP&A Regulation's 2000) prior to issue of Complying Development Certificate.
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6. Design Certificate in accordance with Structural Engineering prepared by Woolacotts Consulting, dated 29 July 2009.
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19. Structural drawings prepared by Woolacotts Consulting, numbered: 3840-S-HA-14S-2001/A, 2002/A, 2003/A, 2004/A.
20. Sydney Water Building Plan approval, notice of requirements, dated 13 September 2009

Environmental planning instrument decision made under
List Complying & Exempt Development DCP, SEPP 60, LEP and relevant clause: SEPP (infrastructure) 2007

Complying Development Certificate
Certificate no.: 09/2479-1
Date of Determination: 16 October 2009

Certificate / Certifying Authority

I, Mike Gooley certify that the proposed development is complying development and that if carried out in accordance with the plans and specifications will comply with all development standards, any standards in a DCP and all requirements of the Regulation under the Environmental Planning and Assessment Act 1979; and will upon completion be a class 9b building.

Signature

Mike Gooley
Accredited Certifier Grade 1
BPB Registration No. 0143
McKenzie Group Consulting (NSW) Pty Ltd
ACN 093 211 995

Date of endorsement: 16 October 2009
Certificate Number: **09/2479-1**

ATTACHMENT 1
Proposed Fire Safety Schedule
(Pursuant to Clause 168 of the Environmental Planning and Assessment Regulation 2000)

	Items to be inspected or tested as nominated by the relevant authority	Deemed to satisfy installation standard/code/conditions of approval
1.	Emergency Lighting	BCA Clause E4.2, E4.4 & AS/NZS 2293.1 – 1998
2.	Exit Signs	BCA Clauses E4.5, E4.6 & E4.8 and AS/NZS 2293.1 – 1998
3.	Fire Hydrant System	Clause E1.3 & AS 2419.1 – 2005
4.	Paths of Travel	EP&A Reg 2000 Clause 186
5.	Portable Fire Extinguishers	BCA Clause E1.6 & AS 2444 – 2001

16 October 2009

File:03962-04CDCCL

McKENZIE
GROUP CONSULTING

Brookfield Multiplex
Level 2, 169 Macquarie Street,
Parramatta NSW 2150

Attention: **Melody Kazzi**

Dear Melody,

Re: **Construction & Occupation Phase**
Parramatta East Public School,
Brabyn Street, Parramatta

Please find enclosed your **Complying Development Certificate.**

Construction Inspections

Your fee agreement will list the number of inspections allowed for. Depending on previous discussions and the fee arrangements, this company and your Consulting Engineers will be carrying out the required inspections. Where the latter applies then a 'Letter of Compliance' signed by the Engineer is required for each inspection. Regardless of who is carrying out inspections we should be notified as to who will be undertaking the inspections.

Please note that the Final Completion inspection must be undertaken by McKenzie Group Consulting; there fore please contact our office in advance to ensure this requirement can be undertaken.

Building Occupation
The certificates or statements which will be needed for a Statement of Compliance:

- Fire Safety Certificate for the following essential services to the standard nominated on the Fire Safety Schedule:
  - Portable Fire Extinguishers to AS 2444-2001, BCA, Clause E1.6,
  - Emergency Lighting & Exit Signs to AS2293.1-2005, BCA, Clause E4.4, E4.5, E4.6, E4.8.
  - Fire Hydrant System to AS2419.1-1994, BCA, Clause E1.3 – Please provide location of hydrants to achieve coverage.
- Please provide a Final Fire Safety Certificate for the building. (Note: provision of the Annual Fire Safety Statement issued within the last six (6) months is acceptable).

  Note: In accordance with Clause 177 of the Environmental Planning & Assessment Regulation 2000, a copy of the Fire Safety Schedule should be prominently displayed within the building.
- Statement or certificate from the mechanical services engineer or contractor stating that the mechanical systems have been installed and commissioned to AS1668.2 -2002 and Part J of the BCA.
- Plumbing Certificate of compliance to AS3500 and part J of the BCA.

- Statement or certificate from the civil engineer or contractor confirming that the installation, operation and discharge of the storm water system is in accordance with the approved Construction Certificate drawings and in accordance with AS3500.3-2003.
- Where Hydrants are installed, confirmation that the hydrant block plan has been provided.
- Statement or certificate from the electrical contractor stating that the electrical installation is installed in accordance with AS3000 and Part J of the BCA.
- Certificate from a registered practicing structural engineer stating that structural adequacy for all structural component of the building, including structural steelwork, reinforced concrete and load bearing block work is adequate certificates should reference the relevant Australian Design Codes and plans and specifications relevant to the work.
- Statement or certificate from the structural engineer or contractor stating that all handrails, balustrades and fixings have been designed and installed to resist loads to AS1170.1-1989.
- Statement or certificate from the contractor stating that the application of waterproofing to wet areas has been installed in accordance with AS3740-2004.
- Statement or certificate from glazier that all glazed assemblies have been installed in accordance with AS1288-1994 (this includes all internal glazing, french doors, hinged doors, bi-fold doors, revolving doors, fixed louvres, skylights or other windows in the horizontal plane, shop front doors, windows constructed on site, second hand or heritage windows).
- Please provide fire hazard properties of all new materials finishes and linings in accordance with clause C1.10 of the BCA.
- Please provide a statement or certificate from the relevant contractor confirming that the carpark and roadways have been completed on accordance with the relevant construction certificate documentation AS2890.1-1993.
- Statement or Certificate from contractor responsible for construction of walls within 20m of adjoining residential boundaries confirming compliance with Acoustic Performance element, contained in item 11.05.e of the School Facilities Standards – Design Standard – Version 01/09/2006.
- Statement of Certificate confirming installed building fabric achieved compliance with Part J1, J2, J3 of the BCA and all services achieve compliance with Part J of the BCA.

If you have any queries, please do not hesitate to contact the undersigned.

Yours faithfully,

T Williams

Per
Chris Bailey
Assistant Building Surveyor
McKenzie Group Consulting (NSW) Pty Ltd
ACN 093 211 955

09-100

DESIGN INTENT CERTIFICATION
CIVIL ENGINEERING

SCHOOL	Parramatta East Public School					
PROJECT:	NSW School ID: 3840					
I, Stephen Branch (Name) of Woolacotts. Consulting Engineers (Firm) 2A BroughtonRoad, Artarmon NSW 2064 (Address)						
Qualifications and Experience:	BE(Hons) MEngSc FIEAust CPEng NPER Structural and Civil – Membership No. 312987					
Phone Numbers:	Bus:	(02) 9413 1399	Fax:	(02) 9413 1132	Mob:	0417 508 833

Hereby certify:

We certify that we will prepare the civil design documentation for the aforementioned project to comply with:

The relevant clauses of the Building Codes of Australia, as follows:
Not Applicable

The relevant Australian Standards as follows:
AS 3500 Plumbing and Drainage
AS 3600 Concrete Structures
AS 3700 Masonry Structures

Landcom Managing Urban Stormwater

Parramatta City Council's guidelines for Stormwater Drainage

Upper Parramatta River Catchment Trust On-Site Stormwater Detention Handbook

Signature:		Date:	29 July 2009

DESIGN INTENT CERTIFICATION
STRUCTURAL ENGINEERING

SCHOOL:	Parramatta East Public School
PROJECT:	NSW School ID: 3840

I, Stephen Branch (Name) of Woolacotts, Consulting Engineers (Firm)
2A Broughton Road, Artarmon NSW 2064 (Address)

Qualifications and Experience:	BE(Hons) MEngSc FIEAust CPEng NPER Structural and Civil – Membership No. 312987					
Phone Numbers:	Bus:	(02) 9413 1399	Fax:	(02) 9413 1132	Mob:	0417 508 833

Hereby certify:

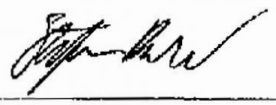
We certify that we will prepare the structural design documentation for the aforementioned project in accordance with the following standards: -

The relevant clauses of the Building Codes of Australia, as follows:

Section B – Structural provisions

The relevant Australian Standards as follows:

AS 1170.0	Structural Design Actions General Principles
AS 1170.1	Structural Design Actions Permanent, Imposed and other actions
AS 1170.2	Structural Design Actions and Wind Actions
AS 1170.3	Structural Design Actions Snow and Ice Actions
AS 1170.4	Structural Design Actions Earthquake Actions
AS 3600	Concrete Structures
AS 3700	Masonry Structures
AS 4100	Steel Structures

Signature:		Date:	29 July 2009

DESIGN CERTIFICATION: ARCHITECTURAL

ADDRESS:	Brabyn Street, Parramatta NSW 2150
PROJECT:	NSW Sch. ID: 3840 – Parramatta East Public School

We herby specify that the proposed new works shall achieve compliance with the following: -

1. All floor, wall and ceiling lining in accordance with the Fire Hazard Properties note in Specification C1.10a of the BCA.
2. Clause D2.21 of the BCA requires all door handles to ... "be readily openable without a key from the side that faces a person seeking egress, by a single hand downward action or pushing action on a single device which is located between 900mm and 1,200mm from the floor, except if it is fitted with a fail-safe device ..."
3. Part B1 of the BCA requires all glazing to comply with Australian Standard 1288 – 2006 and AS 2047-1999.
4. Part D3 of the BCA requires access for people with disabilities to comply with AS 1428.1 and AS 1428.4 *(except where superseded by the Schools Facilities Standard)*.
5. Wet Areas in accordance with Clause F1.7 of the BCA and AS3740-2004.
6. Termite Control in accordance with Clause B1.9 of the BCA and AS3600.1-2000.
7. That the proposed works are located greater than 1.0m from a public sewer.
8. All new materials to external walls and the roof will be constructed of non-reflective material.
9. Noise standard: for walls within 20m of adjoining residential boundaries, there walls will be constructed to meet the Acoustic Performance elements contained in item 11.05.e of the School Facilities Standards – Design Standard – Version 1/09/2006.
10. Overshadowing Standard: The Proposed works will not overshadow adjoining residential properties in accordance with Clause 31A (e) (i) and (ii) of the Environmental Planning Policy (Infrastructure) 2007.
11. Energy Efficiency: The proposed building fabric for the subject development will achieve compliance with Part J1, J2 and J3 of the BCA (supported by attached Glazing Calculator).

Applicant Details:		
Name:	Darren Chan	
Company:	Krikis Tayler Architects	
Address:	Level 7, 97 Pacific Highway, North Sydney NSW 2060	
Signature:	Darren Chan	**Date: 24 July 2009**

DESIGN CERTIFICATION: ELECTRICAL SERVICES

SCHOOL:	3840 Parramatta East Public School					
PROJECT:	BUILDING EDUCATION REVOLUTION					
I, YOGESH MAHARAJ			I, YOGESH MAHARAJ			
1/92 WETHRILL STREET SILVERWATER NSW 2128 AUSTRALIA						
Qualifications and Experience:	DIP.ELECTRICAL ENGINEERING 16 YEARS ELECTRICAL/ENGINEERING					
Phone Numbers:	Bus:	9475 9471	FAX:	9748 0040	MOB:	0413 741840

Hereby certify:

That all proposed electrical and power services relating to the abovementioned project have been checked and designed comply with:

The relevant clauses of the Building Codes of Australia, as follows:
Part E4 BCA 2009
Part J6 BCA 2009

The relevant Australian Standards listed in the Building Code of Australia (Specification A1.3) as follows:
AS 2293.1 - 2005
AS/NZS 3000 – 2000
AS 1680.0 - 1998
AS 1680.1 - 1990
AS 1680.2 - 1994

Signature:		Date:	24/07/09

DESIGN CERTIFICATION: FIRE SERVICES

SCHOOL:	3840 Parramatta East Public School				
PROJECT:	BUILDING EDUCATION REVOLUTION				
I, YOGESH MAHARAJ		I, YOGESH MAHARAJ			
1/92 WETHRILL STREET SILVERWATER NSW 2128 AUSTRALIA					
Qualifications and Experience:	DIP.ELECTRICAL ENGINEERING 16 YEARS ELECTRICAL/ENGINEERING				
Phone Numbers:	Bus:	9476 9471	FAX:	9748 0040	MOB: 0413 741840
Hereby certify:					

That all proposed electrical and power services relating to the abovementioned project have been checked and designed comply with:

The relevant clauses of the Building Codes of Australia, as follows: E2.2A

The relevant Australian Standards listed in the Building Code of Australia (Specification A1.3) as follows:
AS 3786
AS1670

Signature:		Date:	24/07/09

DESIGN CERTIFICATION: MECHANICAL SERVICES

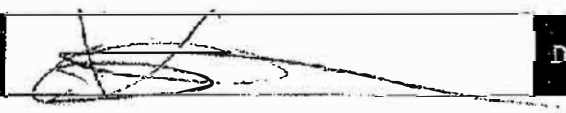
SCHOOL:	Parramatta East PUBLIC SCHOOL					
PROJECT:	BUILDING EDUCATION REVOLUTION					
I, HANI DANYAL (Name) of FREDON AIR (Firm)						
Unit 1, 92 WETHERILL STREET, SILVERWATER, NSW 2128 (Address)						
Qualifications and Experience:	B.SC. ENGINEERING 8 YEARS MECHANICAL ENGINEER-BUILDING SERVICES					
Phone Numbers:	Bus:	(02) 9475 9487	Fax:	(02) 9478 0040	Mob:	04 1250 0841

Hereby certify:

That the proposed mechanical services components relating to the abovementioned project have been checked and designed comply with:

The relevant clauses of the Building Codes of Australia, as follows:
Part F4 BCA 2009
Part J5 BCA 2009
Clause J3.5 BCA 2009 (miscellaneous exhaust fans)

The relevant Australian Standards listed in the Building Code of Australia (Specification A1.3) as follows:
AS 1668.2 - 1991

Signature:		Date:	24 July 2009

Design Notes:

- All rooms listed below, are to be supplied with Natural Ventilation devices supplied and controlled by others.
  - Communal space
  - Raised platform area
  - Girls Toilet
  - Boys Toilet
  - MSB Room
  - Hydraulic Services
  - CDS
- Sound CBD store room is to be mechanically ventilated.
- Accessible Shower & toilet is to be mechanically ventilated.

DESIGN CERTIFICATION: HYDRAULIC SERVICES

SCHOOL	3840 PARRAMATTA EAST PUBLIC SCHOOL
PROJECT:	BUILDING EDUCATION REVOLUTION – RIVERS REGION

I, Thomas Quick (Name) of QUICK CONTRACTING (NSW) P/L (Firm)

Factory 21 / 32 Perry Street, Matraville NSW 2036 (Address)

Qualifications and Experience:	12 Years in Construction Management – Hydraulics Works					
Phone Numbers:	Bus:	02 9316 9206	Fax:	02 9316 8212	Mob:	0418 603 404

Hereby certify:

That all proposed hydraulic services relating to the abovementioned project have been checked and designed comply with:

The relevant clauses of the Building Codes of Australia, as follows:
Part E1.3 BCA 2009 & that Hydrant Coverage is provided to the development in accordance with the Schools Facilities Standard – Design Standard – Version 1 (May 2006).
Part E1.4 BCA 2009 (where applicable)
Clause F1.1 of the BCA and AS3500.3-2003.

The relevant Australian Standards listed in the Building Code of Australia (Specification A1.3) as follows:
AS/NZS 3500.1 - 2003
AS 2419.1 - 2005
AS 2441 – 2005 (where applicable)

Soil and Sediment Control Measures in accordance with "*The Blue Book*"

Signature:	T. Quick	Date:	22.07.2009

SYDNEY WATER
BUILDING PLAN APPROVED
SUBJECT TO REQUIREMENTS

Dolfin No:D09/0-02442 Quick Check Ref No: 2626970

e-Developer Case No: 116946 – N/A- Adjustment & Deviation no longer required due to Building design change.

Property Location

Street No: Lot No: Lot 2pt1

Street Name: Brabyn St
Suburb: North Parramatta

Building/Structure Description: 14 SQ HALL & COLA

Building Plan No: 3840-A-HA-14S-1901-C Engineers Plan No: 3840-A-HA-14S-1915-D, 3840-S-HA-14S-1950-C, 3840-S-HA-14S-2001-A 3840-S-HA-14S-2002-A, 3840-S-14S-2003-A, 3840-S-HA-14S-2004-B & 109073-02-2-A (Service protection Report)

Proposed building/~~structure~~ is **APPROVED** to construct **OVER/~~ADJACENT~~ TO** a Sydney Water sewer/asset, subject to the following requirements:
(NB. Delete non applicable requirements)

1. The ~~foundations/~~piers are to be founded below 0.3 ~~zone of influence,~~ weathered rock strata.
2. No part of the building/~~structure~~ or its foundations to be less than a minimum 0.9 metre, horizontal distance from the centreline of the sewer.
3. ~~No part of the swimming pool or its foundations to be less than a minimum ..... metre, horizontal distance from the centreline of the sewer to the outer edge of the pool coping.~~
4. No part of the building/structure ~~or swimming pool coping~~ to be less than 1 m horizontal distance from outside edge of maintenance hole rim / maintenance shaft rim / lamphole rim / vertical rim / rodding point or edge of ventshaft.
5. ~~No piering of building/structure to be less than 2 m horizontal distance from centreline of maintenance hole to edge of piers.~~
6. Foundations/piers are constructed in accordance with Engineers detail plans (stated above) as submitted to Sydney Water.
7. All foundations/piers are to be founded to below the zone of influence or to solid rock.
8. ~~Indemnity letter to be signed by owner/s of property and returned to Water Servicing Coordinator prior to issue of building plan approval.~~
9. Concrete encase approximately 22 metres of sewer. Concrete encasement to be carried out by an Accredited Constructor of Minor Works (Sewer) / Constructor and a Minor Works Agreement signed prior to commencement of works.
10. Concrete encasement must extend a minimum of 600 mm past the external walls of the building/structure.
11. ~~Minimum of ..... mm vertical clearance between top of concrete encasement to underside of concrete slab.~~
12. ~~Minimum of ..... mm of compressible membrane between top of concrete encasement to underside of concrete~~ slab.
13. ~~Property connection point (junction) to be inserted under Minor Works Agreement.~~
14. ~~All works are to be completed in accordance with Case No.~~

SPECIAL REQUIREMENTS

(a) Concrete Encasement to be inspected

(b) Piering to be inspected

NOTE:

Above requirements must be ~~inspected/supervised~~ by an Accredited Supplier or Sydney Water to enable the issue of a satisfactory compliance letter.

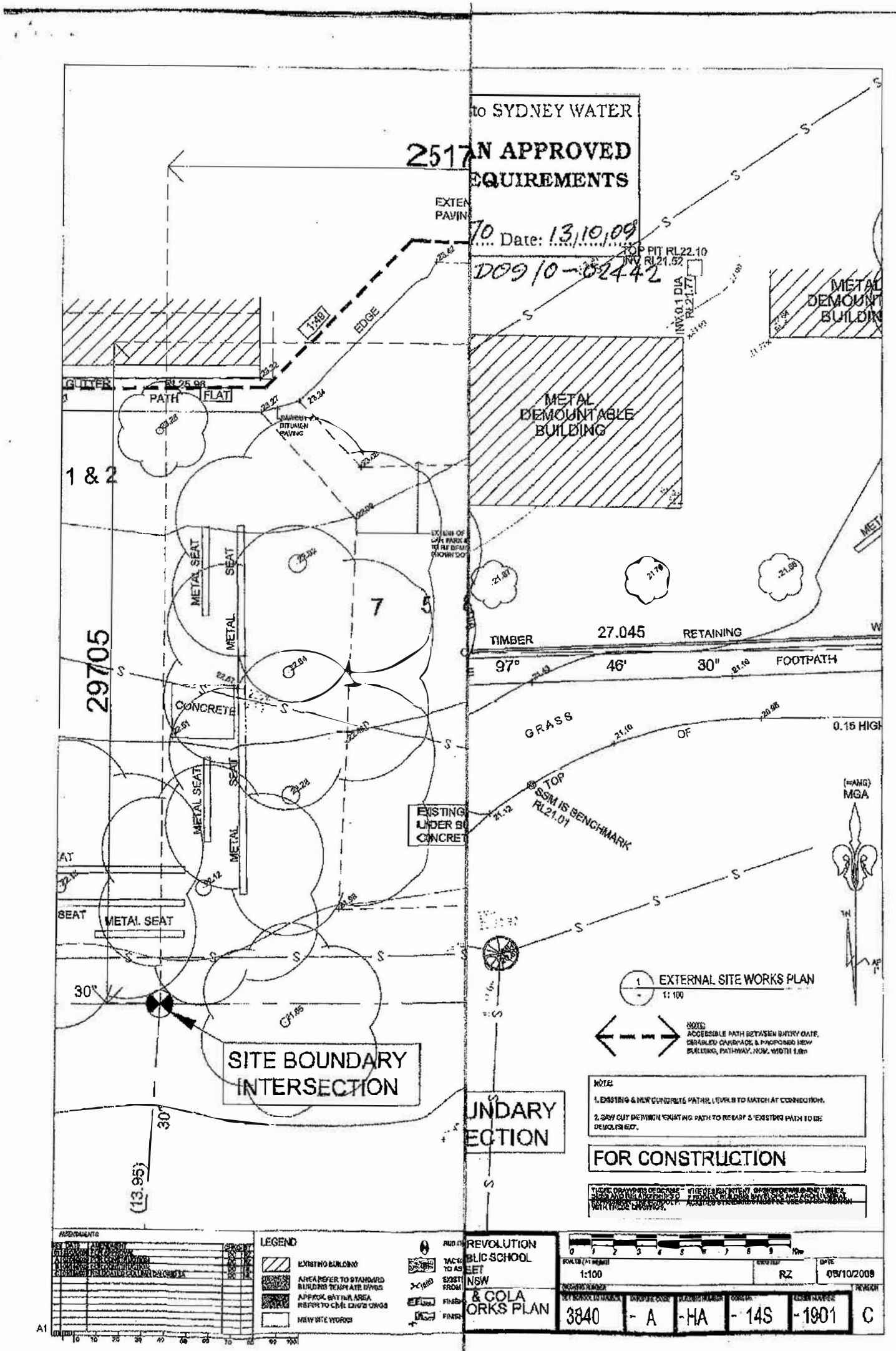
Permits are required to fill all new swimming pools with a capacity greater than 10,000 litres. To arrange for a permit please contact Sydney Water on 13 20 92 during business hours. Fines will apply for filling swimming pools without a permit.

APPROVED BY

WSC Company Name: Cardno Forbes Rigby Pty Ltd

Name of Key Personnel: Raija Hannam.

Signature of Key Personnel: Raija Hannam Date: 13/09/09


to SYDNEY WATER
2517 N APPROVED
EQUIREMENTS
70 Date: 13/10/09
D0910-02442
EXTEN
PAVIN
TOP PIT RL22.10
INV RL21.52
INV 0.1 DIA
RL21.77
METAL
DEMOUNT
BUILDIN
1:49
EDGE
GUTTER
PATH
FLAT
METAL DEMOUNTABLE BUILDING
1 & 2
29705
METAL SEAT
SEAT
METAL
7
5
TIMBER
27.045
RETAINING
97°
46'
30"
FOOTPATH
CONCRETE
GRASS
0.15 HIGH
TOP
SSM IS BENCHMARK
RL21.01
EXISTING
UNDER BU
CONCRET
MGA
SEAT
METAL SEAT
30"
SITE BOUNDARY
INTERSECTION
UNDARY
ECTION
(13.95)
EXTERNAL SITE WORKS PLAN
1:100
ACCESSIBLE PATH BETWEEN ENTRY GATE, DISABLED CARPARK & PROPOSED NEW BUILDING, PATHWAY. NOM. WIDTH 1.8m
1. EXISTING & NEW CONCRETE PATHS LEVELS TO MATCH AT CONNECTION.
2. SAW CUT BETWEEN EXISTING PATH TO REMAIN & EXISTING PATH TO BE DEMOLISHED.
FOR CONSTRUCTION
LEGEND
EXISTING BUILDING
AREA REFER TO STANDARD BUILDING TEMPLATE DWGS
APPROX BATTER AREA REFER TO CIVIL ENGR DWGS
NEW SITE WORKS
REVOLUTION
BLIC SCHOOL
ET
NSW
& COLA
ORKS PLAN
1:100
RZ
08/10/2009
3840
- A
-HA
- 14S
-1901
C
A1

State Environmental Planning Policy (Infrastructure) 2007

31A Complying development—existing schools and TAFE establishments

(1) Development carried out by or on behalf of any person on land within the boundaries of an existing school or TAFE establishment is complying development if:

(a) it is carried out for the purpose of the construction of, or alterations or additions to, any of the following:

(i) a library or an administration building,

(ii) a gym, indoor sporting facility or hall,

(iii) a classroom, lecture theatre, laboratory, trade or training facility,

(iv) a tuckshop, cafeteria, bookshop or child care facility to provide for students or staff (or both),

(v) a hall with associated covered outdoor learning area or tuck shop,

(vi) if the development is not on bush fire prone land or if the educational establishment is not, or does not contain, a heritage item—an outdoor learning or play area and associated awnings or canopies,

(vii) a car park, and

(b) it complies with the requirements of this clause.

(1A) Development carried out by or on behalf of any person on land within the boundaries of an existing school or TAFE establishment is complying development if the development is an alteration or addition referred to in subclause (1) and is carried out for the purposes of a change of use from an existing use to another use specified in that subclause.

(2) To be complying development, the development must:

(a) be permissible, with consent, in the zone in which it is carried out, and

(b) meet the relevant deemed-to-satisfy provisions of the *Building Code of Australia*, and

(c) not be carried out within 1m of any public sewer except with the written approval of the authority that has management or control of the main.

Note. Section 76A of the Act also provides that certain development cannot be complying development.

(3) (Repealed)

(4) The following are the development standards for complying development under this clause:

(a) **Building height standard**. The building height of a building must not exceed 12m.

(b) Side and rear setback standard. A building must be located at least 5m from any side or rear boundary of the land.

(c) **Materials standard**. Any new external walls or roof of a building must be constructed of non-reflective material.

(d) **Noise standard**. A building to be used for the purpose of a gym, indoor sporting facility or hall that is located less than 20m from a common boundary with land zoned residential must be designed to meet the acoustic performance elements contained in item 11.05.e of the State government publication *School Facilities Standards—Design Standard—Version 1/09/2006*.

(e) **Overshadowing standard.** A building must not overshadow any adjoining residential property so that:

(i) solar access to any habitable room on the adjoining property is reduced to less than the minimum level (being 2 hours of solar access between 9 am and 3 pm at the winter solstice) or is reduced in any manner (if solar access to any habitable room on the adjoining property is already below the minimum level), or

(ii) solar access to the principal private open space of the adjoining property is reduced to less than the minimum level (being 3 hours of solar access to not less than 50% of that principal private open space between 9 am and 3 pm at the winter solstice) or is reduced in any manner (if solar access to the principal private open space of the adjoining property is already below the minimum level).

(5) Prior to completion of building works & damage to the footpaths & any public infrastructure are to be made good by the construction contractor.

APPLICATION FOR - COMPLYING DEVELOPMENT CERTIFICATE

Pursuant to State Environmental Planning Policy (Infrastructure) 2007

Under Sections 81A(b1)(i), 81A (2), 81A (4), 86(1), 86(2), 109C (1) (b) and Clause 126 Part 7, Div 1 of the Environmental Planning and Assessment Regulations, 2000

Application submitted with
McKenzie Group
Level 6, 189 Kent Street
Sydney NSW 2000
Tel: (02) 8298 6800 Fax (02) 8298 6899

Applicant	Name:	L. dubono		
	Address:	151 Clarence St Sydney		
	Tel:	0418468550	Fax:	
	Email:			
Land Owner Details	Name:	Cecilia Wilsen		
	Address:	151 Clarence st Sydney		
	Tel:	95611647	Fax:	
Consent of all owner(s) (Signatures)	As the owner of the above property consent is granted to this application. Consent is also granted for Accredited Certifiers from McKenzie Group to enter the land to carry out inspections relating to this application:			
	Signature:			
	Name:	Cecilia Wilsen		
	Date:	14 July 2009		
	Note: The owner of the land must sign this form. If the owner is a company then an authorised director of the company must sign this form.			
Subject land	Address:	Parramatta East Public School (3840) Brabyn St, PARRAMATTA NSW 2150		
	Lot/Portion:	Lot 1 & 2 DP 18872,		
	Section:	Lot 14 DP 18872,		
	DP No:	Lot 1 & 2 DP 794926, Lot A & B DP 90635, Lot 1 & 2 Sec 59 DP 758788		
	Municipality	Parramatta		

Nation Building

Complying Development Application

DET Number: 3840

School Name: Parramatta East Public School

Contractor: Brookfield Multiplex Construction Pty Ltd

I, Eric Rolls, of Brookfield Multiplex Construction Pty Ltd have prepared the attached documentation ready for application for Complying Development.

The documents are ready for sign-off by the Applicant Program Delivery Director and land-owner within the Building the Education (BER) Integrated Program Office (IPO).

Name: Eric Rolls

Signature: .....

Date: 13 July 2009

Position: Programme Director

Contact Number: (02) 9256 5000

Description of development ☑ Building work	Description:	14 Core Square Communal Hall & COLA
Schedule to application for a complying Development Certificate	Number of Storeys:	One(1)
	Gross floor Area of New Building (m^2):	336 sq. metres
	Gross Site Area (m^2):	Not Applicable
	It is required that this schedule be completed. The information will be sent to the Australian Bureau of statistics.	
Building Code of Australia building classification As nominated on the development consent	Part:	
	Use:	School
	BCA Class:	9b
Value of work	$: 1,457,222 (Construction cost only)	
Date of receipt (to be completed by certifying authority)	Date:	
Right of appeal	Under s 109K where the certifying authority is a council an applicant may appeal to the Land and Environment Court against the refusal to issue a Construction Certificate within 12 months from the date of the decision.	

Signature of Applicant

R. deBruyn

Name of Applicant

Date: 14/07/09

WSP Airborne Asbestos Fibre Monitoring Results

Certificate of Analysis

WSP Australia Pty Limited

Level 28, 680 George Street Sydney
PO Box 20967, World Square
Telephone +61 2 9272 1407
Email ANZLab@wsp.com

ABN 80 078 004 798

WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC: 17025 - Testing (No. 17199)

LOCATION:	**Parramatta East Public School, Brabyn St, Parramatta NSW 2150**	**CERTIFICATE NO:**	**SYD-PS217217-186839**
CLIENT:	Department of Education - Western Sydney AMU	DATE\S SAMPLED:	14/10/2024
CLIENT ADDRESS:	164 Walters Road, Blacktown NSW 2760	DATE RECEIVED:	17/10/2024
TELEPHONE:	0400329375	DATE ANALYSED:	17/10/2024
EMAIL:	Rajan.Moopanar@det.nsw.edu.au	ORDER NUMBER:	N/A
CONTACT:	Rajan Moopanar	SAMPLED BY:	Vladimir Tomin

TEST METHOD: Filters examined at WSP Corporate Laboratories in accordance with NOHSC (2005) Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres and WSP's Laboratory Procedure (LP4 - Counting of Asbestos).

Lab No	Sample ID	Location	Results (Fibres/Field)	Concentration (Fibres/mL)
Background:				
001	5695	External, schoolgrounds, Demountable D16497, on a staircase rail	0.0 / 100	<0.01
002	5655	External, schoolgrounds, western boundary fence, on a tree branch	0.0 / 100	<0.01
003	5689	External, schoolgrounds, southern boundary fence, on a tree branch	0.0 / 100	<0.01
004	5680	External, schoolgrounds, eastern boundary fence adjacent Gaggin St, on fence	1.0 / 100	<0.01
Field Blanks:				
005	5693		0.0 / 100	Passed

NB: If the fibre count is less than 10 fibres per 100 fields then the count is not significantly above that of background. Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Dust. [N.O.H.S.C.:3003 (2005)]

Approved Counter

Grace Tuckwell

The results contained within this report relate only to the sample(s) analysed.
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Approved Signatory

Name: Leigh Paterson

Authorisation Date
Thursday, 17 October 2024

Certificate of Analysis

WSP Australia Pty Limited

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ABN 80 078 004 798

WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC: 17025 - Testing (No. 17199)

LOCATION:	**Parramatta East Public School, Brabyn St, Parramatta NSW 2150**	**CERTIFICATE NO:**	**SYD-PS217217-186840**
CLIENT:	Department of Education - Western Sydney AMU	DATE\S SAMPLED:	15/10/2024
CLIENT ADDRESS:	164 Walters Road, Blacktown NSW 2760	DATE RECEIVED:	17/10/2024
TELEPHONE:	0400329375	DATE ANALYSED:	17/10/2024
EMAIL:	Rajan.Moopanar@det.nsw.edu.au	ORDER NUMBER:	N/A
CONTACT:	Rajan Moopanar	SAMPLED BY:	Vladimir Tomin

TEST METHOD: Filters examined at WSP Corporate Laboratories in accordance with NOHSC (2005) Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres and WSP's Laboratory Procedure (LP4 - Counting of Asbestos).

Lab No	Sample ID	Location	Results (Fibres/Field)	Concentration (Fibres/mL)
Background:				
001	1958	External, schoolgrounds, Demountable D16497, on a staircase rail	0.0 / 100	<0.01
002	5639	External, schoolgrounds, western boundary fence, on a tree branch	0.0 / 100	<0.01
003	5534	External, schoolgrounds, southern boundary fence, on a tree branch	0.0 / 100	<0.01
004	5554	External, schoolgrounds, eastern boundary fence adjacent Gaggin St, on fence	0.0 / 100	<0.01
Field Blanks:				
005	5542		0.0 / 100	Passed

NB: If the fibre count is less than 10 fibres per 100 fields then the count is not significantly above that of background. Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Dust. [N.O.H.S.C.:3003 (2005)]

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ABN 80 078 004 798

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LOCATION:	**Parramatta East Public School, Brabyn St, Parramatta NSW 2150**	**CERTIFICATE NO:**	**SYD-PS217217-186841**
CLIENT:	Department of Education - Western Sydney AMU	DATE\S SAMPLED:	16/10/2024
CLIENT ADDRESS:	164 Walters Road, Blacktown NSW 2760	DATE RECEIVED:	17/10/2024
TELEPHONE:	0400329375	DATE ANALYSED:	17/10/2024
EMAIL:	Rajan.Moopanar@det.nsw.edu.au	ORDER NUMBER:	N/A
CONTACT:	Rajan Moopanar	SAMPLED BY:	Vladimir Tomin

TEST METHOD: Filters examined at WSP Corporate Laboratories in accordance with NOHSC (2005) Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres and WSP's Laboratory Procedure (LP4 - Counting of Asbestos).

Lab No	Sample ID	Location	Results (Fibres/Field)	Concentration (Fibres/mL)
Background:				
001	5560	External, schoolgrounds, Demountable D16497, on a staircase rail	0.0 / 100	<0.01
002	5547	External, schoolgrounds, western boundary fence, on a tree branch	0.0 / 100	<0.01
003	5650	External, schoolgrounds, southern boundary fence, on a tree branch	0.0 / 100	<0.01
004	5539	External, schoolgrounds, eastern boundary fence adjacent Gaggin St, on fence	0.0 / 100	<0.01
Field Blanks:				
005	5513		0.0 / 100	Passed

NB: If the fibre count is less than 10 fibres per 100 fields then the count is not significantly above that of background. Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Dust. [N.O.H.S.C.:3003 (2005)]

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Authorisation Date
Thursday, 17 October 2024

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LOCATION:	**Parramatta East Public School, Brabyn St, Parramatta NSW 2150**	**CERTIFICATE NO:**	**SYD-PS217217-187035**
CLIENT:	Department of Education - Western Sydney AMU	DATE\S SAMPLED:	17/10/2024
CLIENT ADDRESS:	164 Walters Road, Blacktown NSW 2760	DATE RECEIVED:	22/10/2024
TELEPHONE:	0400329375	DATE ANALYSED:	22/10/2024
EMAIL:	Rajan.Moopanar@det.nsw.edu.au	ORDER NUMBER:	N/A
CONTACT:	Rajan Moopanar	SAMPLED BY:	Vladimir Tomin

TEST METHOD: Filters examined at WSP Corporate Laboratories in accordance with NOHSC (2005) Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres and WSP's Laboratory Procedure (LP4 - Counting of Asbestos).

Lab No	Sample ID	Location	Results (Fibres/Field)	Concentration (Fibres/mL)
Background:				
001	5668	External, schoolgrounds, Demountable D16497, on a staircase rail	0.0 / 100	<0.01
002	5518	External, schoolgrounds, western boundary fence, on a tree branch	0.0 / 100	<0.01
003	5686	External, schoolgrounds, southern boundary fence, on a tree branch	1.0 / 100	<0.01
004	5561	External, schoolgrounds, eastern boundary fence adjacent Gaggin St, on fence	0.0 / 100	<0.01
Field Blanks:				
005	5524		0.0 / 100	Passed

NB: If the fibre count is less than 10 fibres per 100 fields then the count is not significantly above that of background. Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Dust. [N.O.H.S.C.:3003 (2005)]

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Name: Lauren DeRooy

Authorisation Date
Tuesday, 22 October 2024

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LOCATION:	**Parramatta East Public School, Brabyn St, Parramatta NSW 2150**	**CERTIFICATE NO:**	**SYD-PS217217-187039**
CLIENT:	Department of Education - Western Sydney AMU	DATE\S SAMPLED:	18/10/2024
CLIENT ADDRESS:	164 Walters Road, Blacktown NSW 2760	DATE RECEIVED:	22/10/2024
TELEPHONE:	0400329375	DATE ANALYSED:	22/10/2024
EMAIL:	Rajan.Moopanar@det.nsw.edu.au	ORDER NUMBER:	N/A
CONTACT:	Rajan Moopanar	SAMPLED BY:	Vladimir Tomin

TEST METHOD: Filters examined at WSP Corporate Laboratories in accordance with NOHSC (2005) Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres and WSP's Laboratory Procedure (LP4 - Counting of Asbestos).

Lab No	Sample ID	Location	Results (Fibres/Field)	Concentration (Fibres/mL)
Background:				
001	5517	External, schoolgrounds, Demountable D16497, on a staircase rail	1.0 / 100	<0.01
002	5514	External, schoolgrounds, western boundary fence, on a tree branch	0.0 / 100	<0.01
003	5528	External, schoolgrounds, southern boundary fence, on a tree branch	1.0 / 100	<0.01
004	5920	External, schoolgrounds, eastern boundary fence adjacent Gaggin St, on fence	Rejected: Pump failure	
Field Blanks:				
005	5685		0.0 / 100	Passed

NB: If the fibre count is less than 10 fibres per 100 fields then the count is not significantly above that of background. Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Dust. [N.O.H.S.C.:3003 (2005)]

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Grace Tuckwell

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Name: Lauren DeRooy

Authorisation Date
Tuesday, 22 October 2024

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ABN 80 078 004 798

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LOCATION:	**Parramatta East Public School, Brabyn St, Parramatta NSW 2150**	**CERTIFICATE NO:**	**SYD-PS217217-187036**
CLIENT:	Department of Education - Western Sydney AMU	DATE\S SAMPLED:	21/10/2024
CLIENT ADDRESS:	164 Walters Road, Blacktown NSW 2760	DATE RECEIVED:	22/10/2024
TELEPHONE:	0400329375	DATE ANALYSED:	22/10/2024
EMAIL:	Rajan.Moopanar@det.nsw.edu.au	ORDER NUMBER:	N/A
CONTACT:	Rajan Moopanar	SAMPLED BY:	Vladimir Tomin

TEST METHOD: Filters examined at WSP Corporate Laboratories in accordance with NOHSC (2005) Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres and WSP's Laboratory Procedure (LP4 - Counting of Asbestos).

Lab No	Sample ID	Location	Results (Fibres/Field)	Concentration (Fibres/mL)
Background:				
001	5699	External, schoolgrounds, Demountable D16497, on a staircase rail	0.0 / 100	<0.01
002	5698	External, schoolgrounds, western boundary fence, on a tree branch	0.0 / 100	<0.01
003	5515	External, schoolgrounds, southern boundary fence, on a tree branch	0.0 / 100	<0.01
004	1957	External, schoolgrounds, eastern boundary fence adjacent Gaggin St, on fence	1.0 / 100	<0.01
Field Blanks:				
005	1956		0.0 / 100	Passed

NB: If the fibre count is less than 10 fibres per 100 fields then the count is not significantly above that of background. Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Dust. [N.O.H.S.C.:3003 (2005)]

Approved Counter

Grace Tuckwell

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Approved Signatory

Name: Lauren DeRooy

Authorisation Date
Tuesday, 22 October 2024

Certificate of Analysis

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ABN 80 078 004 798

WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC: 17025 - Testing (No. 17199)

LOCATION:	**Parramatta East Public School, Brabyn St, Parramatta NSW 2150**	**CERTIFICATE NO:**	**SYD-PS217217-187092**
CLIENT:	Department of Education - Western Sydney AMU	DATE\S SAMPLED:	22/10/2024
CLIENT ADDRESS:	164 Walters Road, Blacktown NSW 2760	DATE RECEIVED:	23/10/2024
TELEPHONE:	0400329375	DATE ANALYSED:	23/10/2024
EMAIL:	Rajan.Moopanar@det.nsw.edu.au	ORDER NUMBER:	N/A
CONTACT:	Rajan Moopanar	SAMPLED BY:	Vladimir Tomin

TEST METHOD: Filters examined at WSP Corporate Laboratories in accordance with NOHSC (2005) Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres and WSP's Laboratory Procedure (LP4 - Counting of Asbestos).

Lab No	Sample ID	Location	Results (Fibres/Field)	Concentration (Fibres/mL)
Background:				
001	1894	External, schoolgrounds, Demountable D16497, on a staircase rail	1.0 / 100	<0.01
002	1889	External, schoolgrounds, western boudary fence, on a tree branch	1.0 / 100	<0.01
003	1917	External, schoolgrounds, southern boundary fence, on a tree branch	0.0 / 100	<0.01
004	1945	External, schoolgrounds, eastern boundary fence adjacent Gaggin St, on fence	Rejected: Pump displaced	
Field Blanks:				
005	1892		0.0 / 100	Passed

NB: If the fibre count is less than 10 fibres per 100 fields then the count is not significantly above that of background. Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Dust. [N.O.H.S.C.:3003 (2005)]

Approved Counter

Melanie Reed



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Approved Signatory

Name: Mostaq Bayazid



Authorisation Date
Wednesday, 23 October 2024

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
ANC_{BT} Acid Neutralising Capacity - Back Titration
ANCE: Excess Acid Neutralising Capacity
ANZG: Australian and New Zealand Guidelines
B(a)P: Benzo(a)pyrene
Ca: Calcium
$CaCO_3$: Calcium Carbonate
CEC: Cation Exchange Capacity
CRC: Cooperative Research Centre
CT: Contaminant Threshold
DO: Dissolved Oxygen
EC: Electrical Conductivity
Ece: Extract Electrical Conductivity
Eh: Redox Potential
EILs: Ecological Investigation Levels
ESLs: Ecological Screening Levels
ESP Exchangeable Sodium Percentage (Each Na/CEC)
FA: Fibrous Asbestos
FTS: Fluorotelomer sulfonic acid
GIL: Groundwater Investigation Levels
GSW: General Solid Waste
HILs: Health Investigation Levels
HSLs: Health Screening Levels
HSL-SSA: Health Screening Level-SiteSpecific Assessment
K: Potassium
Mg: Magnesium
NA: Sodium
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 Teterachloroethene)
PFAS: Per- and polyfluoroalkyl substances
PFHxS: Perfluorohexanesulfonic acid
PFOA: Perfluorooctanoic acid
PFOS: Perfluorooctanesulfonic acid
pHF: Field pH
pHFOX: Field peroxide pH
pH_{KCL} : pH of filtered 1:20, 1M KCL extract, shaken overnight
PQL: Practical Quantitation Limit
RS: Rinsate Sample
RSL: Regional Screening Levels
RSW: Restricted Solid Waste
S: Sulfur
SAC: Site Assessment Criteria
SCC: Specific Contaminant Concentration
S_{Cr}: Chromium reducible sulfur
S_{NAS}: Net Acid Soluble Sulfur
SSA: Site Specific Assessment
SSHSLs: Site Specific Health Screening Levels
SWL Standing Water Level
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
TRH: Total Recoverable Hydrocarbons
TS: Trip Spike
USEPA: United States Environmental Protection Agency
VOCC: Volatile Organic Chlorinated Compounds
WHO: World Health Organisation

Units used in the Tables

°C Degrees Celsius
dS/m deciSiemens per metre
m meters
meq/100g milliequivalents per 100 grams
mg/kg milligrams per kilogram
mg/L milligrams per litre
mV millivolts
µg/kg micrograms per kilogram
µg/L micrograms per litre
µS/cm microSiemens per centimetre
mol H^+/t moles hydrogen per tonne
ohm.cm ohm centimetre
%w/w weight per weight

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).

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

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.

Groundwater Ecology Tables:
- 95% refers to a concentration that has been derived to protect 95% of aquatic species

ASS Tables
- 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

Summary of Soil Laboratory Results - EC and Ece
- The salinity Class has been adopted from 'Site Investigations for Urban Salinity' DLWC 2002.
- The chart function assumes an ECe value of 1.9 for values that are less than the practical quatitation limit.

Summary of Resistivity Calculation on Soil EC Results
- The resistivity values have been calculated on the laboratory EC values.
- The classification has been derived from the Australian Standard 2159-2009 Piling Design and Installation (Table 6.5.2 [A] & [C])
- Table 6.5.2 [A] of Australian Standard 2159-2009 recommends using a Moderate Exposure Classification for Steel Piles in Fresh Water - Soft Running Water

Summary of Soil Laboratory Results - pH
- The pH Classification has been derived from the Australian Standard 2159-2009 Piling Design and Installation (Tables 6.4.2 [C] & 6.5.2 [C])
- Table 6.5.2 [A] of Australian Standard 2159-2009 recommends using a Moderate Exposure Classification for Steel Piles in Fresh Water - Soft Running Water

Summary of Soil Laboratory Results - Sulphate and Chlorides
- The classification has been derived from the Australian Standard 2159-2009 Piling Design and Installation (Table 6.5.2 [A] & [C])
- The chart function assumes an concentration of 0.5mg/kg for values that are less than the practical quatitation limit.

Summary of Soil Laboratory Results - CEC and ESP
- The Sodicity rating has been adopted from the publication 'Site Investigations for Urban Salinity' DLWC 2002.

Summary of Groundwater Laboratory Results
- The classification has been derived from the Australian Standard 2159-2009 Piling Design and Installation (Table 6.5.2 [A] & [C]) .
- Table 6.4.2 [A] recommends using a Mild Exposure Classification for Concrete Piles in Fresh Water - Treat as in Soil Condition 'A'.
- Table 6.5.2 [A] recommends using a Moderate Exposure Classification for Steel Piles in Fresh Water - Soft Running Water.

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

All data in mg/kg unless stated otherwise			HEAVY METALS								PAHs		ORGANOCHLORINE PESTICIDES (OCPs)							OP PESTICIDES (OPPs)	TOTAL PCBs	ASBESTOS FIBRES
			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	Carcinogenic PAHs	HCB	Endosulfan	Methoxychlor	Aldrin & Dieldrin	Chlordane	DDT, DDD & DDE	Heptachlor	Chlorpyrifos		
PQL - Envirolab Services			4	0.4	1	1	1	0.1	1	1	-	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	100
Site Assessment Criteria (SAC)			100	20	100	6000	300	40	400	7400	300	3	10	270	300	6	50	240	6	160	1	Detected/Not Detected
Sample Reference	**Sample Depth**	**Sample Description**																				
BH1	0-0.1	Fill: Sandy Gravel	<4	<0.4	**26**	**26**	**41**	<0.1	**9**	**61**	**1.9**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Detected
BH1 - [LAB_DUP]	0-0.1	Laboratory Duplicate	**6**	<0.4	**20**	**25**	**27**	<0.1	**10**	**52**	**1.4**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH1 - [LAB_TRIP]	0-0.1	Laboratory Triplicate	**4**	<0.4	**15**	**23**	**28**	<0.1	**11**	**88**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH2	0.1-0.4	Fill: Gravelly Sand	**4**	<0.4	**10**	**16**	**7**	<0.1	**9**	**9**	<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	0.04-0.1	Fill: Sandy Gravel	**5**	<0.4	**12**	**34**	**6**	<0.1	**16**	**15**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH4	0.04-0.3	Fill: Gravelly Sand	<4	<0.4	**6**	**76**	**3**	<0.1	**34**	**24**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH5	0.04-0.3	Fill: Gravelly Sand	<4	<0.4	**10**	**13**	**23**	<0.1	**4**	**47**	**1.2**	<0.5	<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 Clay	**9**	<0.4	**22**	**14**	**22**	<0.1	**7**	**41**	**31**	**2.7**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH101	0-0.1	Fill: Silty Clay	**5**	<0.4	**14**	**2**	**12**	<0.1	**1**	**8**	**0.3**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH102	0-0.1	Fill: Sandy Clay	**4**	<0.4	**14**	**13**	**43**	<0.1	**3**	**61**	**0.64**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH103	0-0.1	Fill: Sandy Clay	<4	<0.4	**9**	**10**	**29**	<0.1	**3**	**52**	**0.3**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH104	0-0.2	Fill: Sandy Clay	**5**	<0.4	**16**	**8**	**32**	<0.1	**2**	**30**	**2.1**	**0.5**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH105	0.02-0.1	Fill: Sandy Gravel	<4	<0.4	**16**	**29**	**6**	<0.1	**24**	**22**	**0.4**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH106	0.02-0.1	Fill: Sandy Gravel	**4**	<0.4	**17**	**27**	**10**	<0.1	**23**	**42**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH107	0-0.1	Fill: Sandy Clay	**10**	**0.5**	**19**	**27**	**58**	<0.1	**10**	**120**	**60**	**4.6**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH107	0.3-0.45	Silty Clay	NA	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH108	0-0.1	Fill: Silty Sandy Clay	<4	<0.4	**20**	**10**	**36**	<0.1	**13**	**130**	**0.3**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH109	0.015-0.1	Fill: Sandy Gravel	**5**	<0.4	**17**	**28**	**13**	<0.1	**18**	**590**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH109 - [LAB_DUP]	0.015-0.1	Laboratory Duplicate	**5**	<0.4	**19**	**35**	**16**	<0.1	**22**	**270**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH109 - [LAB_TRIP]	0.015-0.1	Laboratory Triplicate	**6**	<0.4	**17**	**22**	**15**	<0.1	**14**	**340**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH110	0.04-0.1	Fill: Sandy Gravel	<4	<0.4	**8**	**91**	**16**	<0.1	**8**	**41**	**0.5**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH111	0-0.1	Fill: Silty Clay	**7**	<0.4	**18**	**8**	**29**	<0.1	**5**	**32**	**1.6**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH112	0-0.1	Fill: Clayey Sand	<4	<0.4	**14**	**34**	**14**	<0.1	**15**	**38**	**0.4**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH113	0.1-0.3	Fill: Silty Clay	**7**	<0.4	**19**	**15**	**15**	<0.1	**12**	**16**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH114	0-0.1	Fill: Silty Clay	**14**	**0.5**	**20**	**49**	**100**	<0.1	**4**	**220**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH115	0-0.15	Fill: Clayey Sand	**7**	<0.4	**16**	**7**	**33**	<0.1	**3**	**76**	<0.05	<0.5	<0.1	<0.1	<0.1	**2**	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH116	0-0.1	Fill: Silty Clay	**7**	<0.4	**15**	**15**	**68**	<0.1	**3**	**100**	**0.2**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH117	0-0.1	Fill: Silty Gravelly Clay	**19**	<0.4	**31**	**19**	**50**	<0.1	**5**	**81**	**0.4**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Detected
BH118	0-0.1	Fill: Clayey Gravelly Sand	**11**	<0.4	**21**	**200**	**74**	<0.1	**4**	**110**	**0.5**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH119	0-0.15	Fill: Silty Clay	**10**	<0.4	**22**	**31**	**120**	<0.1	**14**	**140**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH120	0-0.1	Fill: Silty Clay	**8**	<0.4	**20**	**8**	**33**	**0.4**	**3**	**56**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Detected
BH121	0-0.1	Fill: Silty Clay	**10**	**0.6**	**27**	**31**	**94**	**0.1**	**5**	**230**	**9.1**	**1.3**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH122	0-0.1	Fill: Silty Clay	**20**	<0.4	**16**	**14**	**83**	<0.1	**4**	**140**	**1.6**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Detected
BH122 - [LAB_DUP]	0-0.1	Laboratory Duplicate	**32**	<0.4	**21**	**20**	**74**	<0.1	**3**	**120**	**0.9**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH123	0-0.1	Fill: Silty Sandy Clay	**4**	<0.4	**10**	**20**	**23**	<0.1	**3**	**98**	**2.1**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH123 - [LAB_DUP]	0-0.1	Laboratory Duplicate	<4	<0.4	**9**	**18**	**20**	<0.1	**3**	**93**	**1.1**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH124	0-0.1	Fill: Silty Clay	**9**	<0.4	**18**	**7**	**57**	<0.1	**3**	**73**	**0.51**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
SDUP1	0-0.1	Duplicate of BH1	<4	<0.4	**20**	**43**	**38**	<0.1	**14**	**100**	**1.5**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
SDUP3	0-0.1	Duplicate of BH102	<4	<0.4	**12**	**21**	**61**	<0.1	**4**	**96**	**1**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
SDUP2	0-0.1	Duplicate of BH112	**9**	<0.4	**22**	**15**	**17**	<0.1	**10**	**32**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
SDUP4	0-0.1	Duplicate of BH108	**10**	<0.4	**24**	**9**	**40**	**0.2**	**14**	**110**	**0.35**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	Not Detected
FCF1	Surface	Fragment	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Detected
FCF1-BH116	0-0.1	Fragment	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Detected
FCF1-BH118	0-0.1	Fragment	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Detected
FCF1-BH121	0-0.1	Fragment	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Detected
FCF3-BH122	0-0.1	Fragment	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Detected
Total Number of Samples			40	40	40	40	40	40	40	40	39	39	38	38	38	38	38	38	38	38	37	36
Maximum Value			32	0.6	31	200	120	0.4	34	590	60	4.6	<PQL	<PQL	<PQL	2	<PQL	<PQL	<PQL	<PQL	<PQL	Detected

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

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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	0-0.1	Fill: Sandy Gravel	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH1 - [LAB_DUP]	0-0.1	Laboratory Duplicate	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	NA
BH2	0.1-0.4	Fill: Gravelly Sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH3	0.04-0.1	Fill: Sandy Gravel	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH4	0.04-0.3	Fill: Gravelly Sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH5	0.04-0.3	Fill: Gravelly Sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH7	0-0.1	Fill: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH101	0-0.1	Fill: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH102	0-0.1	Fill: Sandy Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH103	0-0.1	Fill: Sandy Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH104	0-0.2	Fill: Sandy Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH105	0.02-0.1	Fill: Sandy Gravel	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.1
BH106	0.02-0.1	Fill: Sandy Gravel	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH107	0-0.1	Fill: Sandy Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH108	0-0.1	Fill: Silty Sandy Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.1
BH109	0.015-0.1	Fill: Sandy Gravel	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.1
BH109 - [LAB_DUP]	0.015-0.1	Laboratory Duplicate	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	NA
BH110	0.04-0.1	Fill: Sandy Gravel	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.1
BH111	0-0.1	Fill: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.1
BH112	0-0.1	Fill: Clayey Sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH113	0.1-0.3	Fill: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH114	0-0.1	Fill: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH115	0-0.15	Fill: Clayey Sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH116	0-0.1	Fill: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.1
BH117	0-0.1	Fill: Silty Gravelly Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH118	0-0.1	Fill: Clayey Gravelly Sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH119	0-0.15	Fill: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH120	0-0.1	Fill: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH121	0-0.1	Fill: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.8
BH122	0-0.1	Fill: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH122 - [LAB_DUP]	0-0.1	Laboratory Duplicate	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	NA
BH123	0-0.1	Fill: Silty Sandy Clay	0m to <1m	Sand	<25	**240**	<0.2	<0.5	<1	<1	<1	0.1
BH123 - [LAB_DUP]	0-0.1	Laboratory Duplicate	0m to <1m	Sand	<25	**220**	<0.2	<0.5	<1	<1	<1	NA
BH123_Silica Gel	0-0.1	Fill: Silty Sandy Clay	0m to <1m	Sand	NA	**130**	NA	NA	NA	NA	NA	NA
BH123_Silica Gel - [LAB_DUP]	0-0.1	Laboratory Duplicate	0m to <1m	Sand	NA	**160**	NA	NA	NA	NA	NA	NA
BH124	0-0.1	Fill: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.1
SDUP1	0-0.1	Duplicate of BH1	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	-
SDUP3	0-0.1	Duplicate of BH102	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	-
SDUP2	0-0.1	Duplicate of BH112	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	-
SDUP4	0-0.1	Duplicate of BH108	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	NA	<1	-
Total Number of Samples					38	40	38	38	38	37	38	30
Maximum Value					<PQL	240	<PQL	<PQL	<PQL	<PQL	<PQL	0.8

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	0-0.1	Fill: Sandy Gravel	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH1 - [LAB_DUP]	0-0.1	Laboratory Duplicate	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH2	0.1-0.4	Fill: Gravelly Sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH3	0.04-0.1	Fill: Sandy Gravel	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH4	0.04-0.3	Fill: Gravelly Sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH5	0.04-0.3	Fill: Gravelly Sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH7	0-0.1	Fill: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH101	0-0.1	Fill: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH102	0-0.1	Fill: Sandy Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH103	0-0.1	Fill: Sandy Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH104	0-0.2	Fill: Sandy Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH105	0.02-0.1	Fill: Sandy Gravel	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH106	0.02-0.1	Fill: Sandy Gravel	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH107	0-0.1	Fill: Sandy Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH108	0-0.1	Fill: Silty Sandy Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH109	0.015-0.1	Fill: Sandy Gravel	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH109 - [LAB_DUP]	0.015-0.1	Laboratory Duplicate	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH110	0.04-0.1	Fill: Sandy Gravel	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH111	0-0.1	Fill: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH112	0-0.1	Fill: Clayey Sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH113	0.1-0.3	Fill: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH114	0-0.1	Fill: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH115	0-0.15	Fill: Clayey Sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH116	0-0.1	Fill: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH117	0-0.1	Fill: Silty Gravelly Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH118	0-0.1	Fill: Clayey Gravelly Sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH119	0-0.15	Fill: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH120	0-0.1	Fill: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH121	0-0.1	Fill: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH122	0-0.1	Fill: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH122 - [LAB_DUP]	0-0.1	Laboratory Duplicate	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH123	0-0.1	Fill: Silty Sandy Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH123 - [LAB_DUP]	0-0.1	Laboratory Duplicate	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH123_Silica Gel	0-0.1	Fill: Silty Sandy Clay	0m to <1m	Sand	NA	110	NA	NA	NA	NA	NA
BH123_Silica Gel - [LAB_DUP]	0-0.1	Laboratory Duplicate	0m to <1m	Sand	NA	110	NA	NA	NA	NA	NA
BH124	0-0.1	Fill: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
SDUP1	0-0.1	Duplicate of BH1	0m to <1m	Sand	45	110	0.5	160	55	40	3
SDUP3	0-0.1	Duplicate of BH102	0m to <1m	Sand	45	110	0.5	160	55	40	3
SDUP2	0-0.1	Duplicate of BH112	0m to <1m	Sand	45	110	0.5	160	55	40	3
SDUP4	0-0.1	Duplicate of BH108	0m to <1m	Sand	45	110	0.5	160	55	NA	3

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

			C_6-C_{10} (F1) plus BTEX	$>C_{10}$-C_{16} (F2) plus napthalene	$>C_{16}$-C_{34} (F3)	$>C_{34}$-C_{40} (F4)
PQL - Envirolab Services			25	50	100	100
NEPM 2013 Land Use Category			**RESIDENTIAL, PARKLAND & PUBLIC OPEN SPACE**			
Sample Reference	**Sample Depth**	**Soil Texture**				
BH1	0-0.1	Coarse	<25	<50	<100	<100
BH1 - [LAB_DUP]	0-0.1	Coarse	<25	<50	<100	<100
BH2	0.1-0.4	Coarse	<25	**220**	**240**	**320**
BH3	0.04-0.1	Coarse	<25	**820**	**600**	**940**
BH4	0.04-0.3	Coarse	<25	**490**	**360**	**610**
BH5	0.04-0.3	Coarse	<25	<50	<100	**110**
BH7	0-0.1	Coarse	<25	<50	<100	<100
BH101	0-0.1	Coarse	<25	<50	<100	<100
BH102	0-0.1	Coarse	<25	<50	<100	<100
BH103	0-0.1	Coarse	<25	<50	<100	<100
BH104	0-0.2	Coarse	<25	<50	<100	<100
BH105	0.02-0.1	Coarse	<25	**540**	**420**	**480**
BH106	0.02-0.1	Coarse	<25	**1000**	**890**	**730**
BH107	0-0.1	Coarse	<25	**280**	**260**	<100
BH108	0-0.1	Coarse	<25	**260**	**230**	<100
BH109	0.015-0.1	Coarse	<25	<50	<100	<100
BH109 - [LAB_DUP]	0.015-0.1	Coarse	<25	<50	<100	<100
BH110	0.04-0.1	Coarse	<25	**130**	**120**	**220**
BH111	0-0.1	Coarse	<25	<50	<100	<100
BH112	0-0.1	Coarse	<25	<50	<100	<100
BH113	0.1-0.3	Coarse	<25	<50	<100	<100
BH114	0-0.1	Coarse	<25	<50	**110**	<100
BH115	0-0.15	Coarse	<25	<50	<100	<100
BH116	0-0.1	Coarse	<25	<50	<100	<100
BH117	0-0.1	Coarse	<25	<50	<100	<100
BH118	0-0.1	Coarse	<25	<50	**130**	<100
BH119	0-0.15	Coarse	<25	<50	<100	<100
BH120	0-0.1	Coarse	<25	<50	<100	<100
BH121	0-0.1	Coarse	<25	<50	<100	<100
BH122	0-0.1	Coarse	<25	**260**	**220**	<100
BH122 - [LAB_DUP]	0-0.1	Coarse	<25	**220**	**190**	<100
BH123	0-0.1	Coarse	<25	**240**	**540**	**250**
BH123 - [LAB_DUP]	0-0.1	Coarse	<25	**220**	**510**	**290**
BH123_Silica Gel	0-0.1	Coarse	NA	**130**	**130**	<100
BH123_Silica Gel - [LAB_DUP]	0-0.1	Coarse	NA	**160**	**110**	<100
BH124	0-0.1	Coarse	<25	<50	<100	<100
SDUP1	0-0.1	Coarse	<25	<50	<100	<100
SDUP3	0-0.1	Coarse	<25	<50	<100	<100
SDUP2	0-0.1	Coarse	<25	<50	<100	<100
SDUP4	0-0.1	Coarse	<25	<50	<100	<100
Total Number of Samples			38	40	40	40
Maximum Value			<PQL	1000	890	940

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	0-0.1	Coarse	700	1000	2500	10000
BH1 - [LAB_DUP]	0-0.1	Coarse	700	1000	2500	10000
BH2	0.1-0.4	Coarse	700	1000	2500	10000
BH3	0.04-0.1	Coarse	700	1000	2500	10000
BH4	0.04-0.3	Coarse	700	1000	2500	10000
BH5	0.04-0.3	Coarse	700	1000	2500	10000
BH7	0-0.1	Coarse	700	1000	2500	10000
BH101	0-0.1	Coarse	700	1000	2500	10000
BH102	0-0.1	Coarse	700	1000	2500	10000
BH103	0-0.1	Coarse	700	1000	2500	10000
BH104	0-0.2	Coarse	700	1000	2500	10000
BH105	0.02-0.1	Coarse	700	1000	2500	10000
BH106	0.02-0.1	Coarse	700	1000	2500	10000
BH107	0-0.1	Coarse	700	1000	2500	10000
BH108	0-0.1	Coarse	700	1000	2500	10000
BH109	0.015-0.1	Coarse	700	1000	2500	10000
BH109 - [LAB_DUP]	0.015-0.1	Coarse	700	1000	2500	10000
BH110	0.04-0.1	Coarse	700	1000	2500	10000
BH111	0-0.1	Coarse	700	1000	2500	10000
BH112	0-0.1	Coarse	700	1000	2500	10000
BH113	0.1-0.3	Coarse	700	1000	2500	10000
BH114	0-0.1	Coarse	700	1000	2500	10000
BH115	0-0.15	Coarse	700	1000	2500	10000
BH116	0-0.1	Coarse	700	1000	2500	10000
BH117	0-0.1	Coarse	700	1000	2500	10000
BH118	0-0.1	Coarse	700	1000	2500	10000
BH119	0-0.15	Coarse	700	1000	2500	10000
BH120	0-0.1	Coarse	700	1000	2500	10000
BH121	0-0.1	Coarse	700	1000	2500	10000
BH122	0-0.1	Coarse	700	1000	2500	10000
BH122 - [LAB_DUP]	0-0.1	Coarse	700	1000	2500	10000
BH123	0-0.1	Coarse	700	1000	2500	10000
BH123 - [LAB_DUP]	0-0.1	Coarse	700	1000	2500	10000
BH123_Silica Gel	0-0.1	Coarse	NA	1000	2500	10000
BH123_Silica Gel - [LAB_DUP]	0-0.1	Coarse	NA	1000	2500	10000
BH124	0-0.1	Coarse	700	1000	2500	10000
SDUP1	0-0.1	Coarse	700	1000	2500	10000
SDUP3	0-0.1	Coarse	700	1000	2500	10000
SDUP2	0-0.1	Coarse	700	1000	2500	10000
SDUP4	0-0.1	Coarse	700	1000	2500	10000

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

Analyte		C_6-C_{10}	>C_{10}-C_{16}	>C_{16}-C_{34}	>C_{34}-C_{40}	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	PID
PQL - Envirolab Services		25	50	100	100	0.2	0.5	1	1	1	
CRC 2011 -Direct contact Criteria		4,400	3,300	4,500	6,300	100	14,000	4,500	12,000	1,400	
Site Use		RESIDENTIAL WITH ACCESSIBLE SOIL- DIRECT SOIL CONTACT									
Sample Reference	**Sample Depth**										
BH1	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH1 - [LAB_DUP]	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	NA
BH2	0.1-0.4	<25	<50	**240**	**320**	<0.2	<0.5	<1	<1	<1	0
BH3	0.04-0.1	<25	<50	**600**	**940**	<0.2	<0.5	<1	<1	<1	0
BH4	0.04-0.3	<25	<50	**360**	**610**	<0.2	<0.5	<1	<1	<1	0
BH5	0.04-0.3	<25	<50	<100	**110**	<0.2	<0.5	<1	<1	<1	0
BH7	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH101	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH102	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH103	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH104	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH105	0.02-0.1	<25	<50	**420**	**480**	<0.2	<0.5	<1	<1	<1	**0.1**
BH106	0.02-0.1	<25	<50	**890**	**730**	<0.2	<0.5	<1	<1	<1	0
BH107	0-0.1	<25	<50	**260**	<100	<0.2	<0.5	<1	<1	<1	0
BH108	0-0.1	<25	<50	**230**	<100	<0.2	<0.5	<1	<1	<1	**0.1**
BH109	0.015-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.1**
BH109 - [LAB_DUP]	0.015-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	NA
BH110	0.04-0.1	<25	<50	**120**	**220**	<0.2	<0.5	<1	<1	<1	**0.1**
BH111	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.1**
BH112	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH113	0.1-0.3	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH114	0-0.1	<25	<50	**110**	<100	<0.2	<0.5	<1	<1	<1	0
BH115	0-0.15	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH116	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.1**
BH117	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH118	0-0.1	<25	<50	**130**	<100	<0.2	<0.5	<1	<1	<1	0
BH119	0-0.15	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH120	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH121	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.8**
BH122	0-0.1	<25	<50	**220**	<100	<0.2	<0.5	<1	<1	<1	0
BH122 - [LAB_DUP]	0-0.1	<25	<50	**190**	<100	<0.2	<0.5	<1	<1	<1	NA
BH123	0-0.1	<25	**240**	**540**	**250**	<0.2	<0.5	<1	<1	<1	**0.1**
BH123 - [LAB_DUP]	0-0.1	<25	**220**	**510**	**290**	<0.2	<0.5	<1	<1	<1	NA
BH123_Silica Gel	0-0.1	NA	**130**	**130**	<100	NA	NA	NA	NA	NA	NA
BH123_Silica Gel - [LAB_DUP]	0-0.1	NA	**160**	**110**	<100	NA	NA	NA	NA	NA	NA
BH124	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.1**
SDUP1	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	-
SDUP3	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	-
SDUP2	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	-
SDUP4	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	NA	<1	-
Total Number of Samples		38	40	40	40	38	38	38	37	38	30
Maximum Value		<PQL	240	890	940	<PQL	<PQL	<PQL	<PQL	<PQL	0.8

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

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

FIELD DATA															LABORATORY DATA										
Date Sampled	Sample reference	Sample Depth	Visible ACM in top 100mm	Approx. Volume of Soil (L)	Soil Mass (g)	Mass ACM (g)	Mass Asbestos in ACM (g)	[Asbestos from ACM in soil] (%w/w)	Mass ACM <7mm (g)	Mass Asbestos in ACM <7mm (g)	[Asbestos from ACM <7mm in soil] (%w/w)	Mass FA (g)	Mass Asbestos in FA (g)	[Asbestos from FA in soil] (%w/w)	Lab Report Number	Sample refeference	Sample Depth	Sample Mass (g)	Asbestos ID in soil (AS4964) >0.1g/kg	Trace Analysis	Total Asbestos (g/kg)	Asbestos ID in soil <0.1g/kg	ACM >7mm Estimation (g)	FA and AF Estimation (g)	ACM >7mm Estimation %(w/w)	FA and AF Estimation %(w/w)
SAC			**No**					**0.01**			**0.001**			**0.001**											**0.01**	**0.001**
12/07/2022	BH1	0-0.1	No	<10	9,350	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	300587	BH1	0-0.1	805.99	Chrysotile asbestos detected: Organic fibres detected	No asbestos detected	0.1843	See Above	0.1485	–	0.0184	<0.001
12/07/2022	BH2	0.1-0.4	NA	10	13,280	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	300587	BH2	0.1-0.4	850.59	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
12/07/2022	BH3	0.04-0.1	No	<10	8,060	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	300587	BH3	0.04-0.1	484.31	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
12/07/2022	BH4	0.04-0.5	No	<10	5,800	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	300836-D	BH4	0.04-0.3	982.01	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
13/07/2022	BH5	0.04-0.3	No	<10	6,780	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	300836	BH5	0.04-0.3	676.3	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
15/07/2022	BH6	0-0.4	No	10	10,300	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	-	-	-	-	-	-	-	-	-	-	-	-
15/07/2022	BH7	0-0.1	No	10	11,580	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	300836	BH7	0-0.1	676.3	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
15/07/2022	BH7	0.1-0.75	NA	<10	4,200	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	-	-	-	-	-	-	-	-	-	-	-	-
15/07/2022	BH8	0-0.45	No	10	10,950	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	-	-	-	-	-	-	-	-	-	-	-	-
13/07/2022	BH101	0-0.1	No	<10	7,300	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	300836-D	BH101	0-0.1	609.52	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
13/07/2022	BH101	0.1-0.3	NA	<10	2,200	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	-	-	-	-	-	-	-	-	-	-	-	-
13/07/2022	BH102	0-0.1	No	10	10,050	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	300836-D	BH102	0-0.1	747.29	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
13/07/2022	BH102	0.1-0.3	NA	<10	3,350	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	-	-	-	-	-	-	-	-	-	-	-	-
13/07/2022	BH103	0-0.3	No	<10	9,200	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	300836	BH103	0.1-0.3	842.46	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
13/07/2022	BH104	0-0.1	No	10	10,000	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	300836	BH104	0-0.2	995.07	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
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	300836	BH105	0.02-0.1	953	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
15/07/2022	BH106	0.02-0.1	No	<10	1,450	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	300836	BH106	0.02-0.1	680.28	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
15/07/2022	BH107	0-0.1	No	10	10,700	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	300836	BH107	0-0.1	714.12	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
15/07/2022	BH107	0.1-0.3	NA	<10	3,900	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	-	-	-	-	-	-	-	-	-	-	-	-
13/07/2022	BH108	0-0.1	No	10	10,050	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	300836	BH108	0-0.1	655.69	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
13/07/2022	BH108	0.1-0.3	NA	<10	4,320	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	-	-	-	-	-	-	-	-	-	-	-	-
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	300836	BH109	0.015-0.1	859.85	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
15/07/2022	BH109	0.1-0.3	NA	<10	3,400	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	-	-	-	-	-	-	-	-	-	-	-	-
15/07/2022	BH110	0.1-0.3	NA	<10	3,450	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	300836	BH110	0.04-0.10	727.53	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
13/07/2022	BH111	0-0.1	No	10	11,670	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	300836	BH111	0-0.1	859.91	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
13/07/2022	BH111	0.1-0.3	NA	<10	4,890	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	-	-	-	-	-	-	-	-	-	-	-	-
12/07/2022	BH112	0-0.1	No	10	12,000	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	300587	BH112	0-0.1	699.02	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
12/07/2022	BH112	0.1-0.4	NA	<10	3,750	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	-	-	-	-	-	-	-	-	-	-	-	-
15/07/2022	BH113	0-0.1	No	10	10,600	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	300836	BH113	0.1-0.3	538.59	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
15/07/2022	BH113	0.1-0.4	NA	<10	3,700	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	-	-	-	-	-	-	-	-	-	-	-	-
15/07/2022	BH114	0-0.1	No	10	10,100	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	300836	BH114	0-0.1	623.54	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
15/07/2022	BH114	0.1-0.2	NA	<10	4,300	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	-	-	-	-	-	-	-	-	-	-	-	-
14/07/2022	BH115	0-0.15	No	10	15,180	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	300836	BH115	0-0.15	827.64	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
14/07/2022	BH116	0-0.1	Yes	10	10,100	17.0	2.5515	0.0253	No ACM <7mm observed	--	--	No FA observed	--	--	300836	BH116	0-0.1	628.06	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
14/07/2022	BH116	0.1-0.3	NA	10	11,130	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	-	-	-	-	-	-	-	-	-	-	-	-
14/07/2022	BH117	0-0.2	No	<10	6,180	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	300836	BH117	0-0.1	855.58	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	Crocidolite	–	0.0007	<0.01	<0.001
14/07/2022	BH118	0-0.1	Yes	10	11,880	8.5	1.281	0.0108	No ACM <7mm observed	--	--	No FA observed	--	--	300836	BH118	0-0.1	696.02	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
14/07/2022	BH118	0.1-0.2	NA	<10	5,200	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	-	-	-	-	-	-	-	-	-	-	-	-
14/07/2022	BH119	0-0.15	No	10	10,550	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	300836	BH119	0-0.15	735.59	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
14/07/2022	BH120	0-0.1	Yes	10	10,100	98.8	14.8155	0.1467	No ACM <7mm observed	--	--	No FA observed	--	--	300836	BH120	0-0.1	684.78	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	Chrysotile:Amosite	–	0.009	<0.01	0.0013
14/07/2022	BH120	0.1-0.4	NA	10	11,060	12.6	1.8945	0.0171	No ACM <7mm observed	--	--	No FA observed	--	--	-	-	-	-	-	-	-	-	-	-	-	-
14/07/2022	BH121	0-0.1	Yes	10	12,980	2.0	0.3	0.0023	No ACM <7mm observed	--	--	No FA observed	--	--	300836	BH121	0-0.1	705.21	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
14/07/2022	BH121	0.1-0.2	NA	<10	4,360	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	-	-	-	-	-	-	-	-	-	-	-	-
14/07/2022	BH122	0-0.1	Yes	10	10,750	50.6	7.5855	0.0706	No ACM <7mm observed	--	--	No FA observed	--	--	300836	BH122	0-0.1	608.35	Chrysotile asbestos detected: Amosite asbestos detected: Organic fibres detected	No asbestos detected	1.0373	See Above	0.631	–	0.1037	<0.001
14/07/2022	BH122	0.1-0.3	NA	<10	5,490	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	-	-	-	-	-	-	-	-	-	-	-	-
20/07/2022	BH123	0-0.1	No	10	10,610	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	301048	BH123	0-0.1	336.37	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
20/07/2022	BH124	0-0.1	No	10	12,110	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	301048	BH124	0-0.1	577.55	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
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	285674	SDUP4	0-0.1	700	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001

Concentration above the SAC **VALUE**

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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	8	18	104	5	77	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL
Sample Reference	**Sample Depth**	**Sample Description**	**Soil Texture**																				
BH1	0-0.1	Fill: Sandy Gravel	Coarse	NA	NA	NA	<4	**26**	**26**	**41**	**9**	**61**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	**0.3**
BH1 - [LAB_DUP]	0-0.1	Laboratory Duplicate	Coarse	NA	NA	NA	**6**	**20**	**25**	**27**	**10**	**52**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	**0.2**
BH1 - [LAB_TRIP]	0-0.1	Laboratory Triplicate	Coarse	NA	NA	NA	**4**	**15**	**23**	**28**	**11**	**88**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH2	0.1-0.4	Fill: Gravelly Sand	Coarse	NA	NA	NA	**4**	**10**	**16**	**7**	**9**	**9**	<1	<0.1	<25	<50	**240**	**320**	<0.2	<0.5	<1	<1	<0.05
BH3	0.04-0.1	Fill: Sandy Gravel	Coarse	NA	NA	NA	**5**	**12**	**34**	**6**	**16**	**15**	<1	<0.1	<25	<50	**600**	**940**	<0.2	<0.5	<1	<1	<0.05
BH4	0.04-0.3	Fill: Gravelly Sand	Coarse	NA	NA	NA	<4	**6**	**76**	**3**	**34**	**24**	<1	<0.1	<25	<50	**360**	**610**	<0.2	<0.5	<1	<1	<0.05
BH5	0.04-0.3	Fill: Gravelly Sand	Coarse	NA	NA	NA	<4	**10**	**13**	**23**	**4**	**47**	<1	<0.1	<25	<50	<100	**110**	<0.2	<0.5	<1	<1	**0.1**
BH7	0-0.1	Fill: Silty Clay	Fine	NA	NA	NA	**9**	**22**	**14**	**22**	**7**	**41**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	**1.8**
BH101	0-0.1	Fill: Silty Clay	Fine	NA	NA	NA	**5**	**14**	**2**	**12**	**1**	**8**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	**0.07**
BH102	0-0.1	Fill: Sandy Clay	Fine	NA	NA	NA	**4**	**14**	**13**	**43**	**3**	**61**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	**0.1**
BH103	0-0.1	Fill: Sandy Clay	Fine	NA	NA	NA	<4	**9**	**10**	**29**	**3**	**52**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	**0.05**
BH104	0-0.2	Fill: Sandy Clay	Fine	NA	NA	NA	**5**	**16**	**8**	**32**	**2**	**30**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	**0.3**
BH105	0.02-0.1	Fill: Sandy Gravel	Coarse	NA	NA	NA	<4	**16**	**29**	**6**	**24**	**22**	<1	<0.1	<25	<50	**420**	**480**	<0.2	<0.5	<1	<1	**0.1**
BH106	0.02-0.1	Fill: Sandy Gravel	Coarse	NA	NA	NA	**4**	**17**	**27**	**10**	**23**	**42**	<1	<0.1	<25	<50	**890**	**730**	<0.2	<0.5	<1	<1	<0.05
BH107	0-0.1	Fill: Sandy Clay	Fine	NA	NA	NA	**10**	**19**	**27**	**58**	**10**	**120**	<1	<0.1	<25	<50	**260**	<100	<0.2	<0.5	<1	<1	**3**
BH107	0.3-0.45	Silty Clay	Fine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.05
BH108	0-0.1	Fill: Silty Sandy Clay	Fine	NA	NA	NA	<4	**20**	**10**	**36**	**13**	**130**	<1	<0.1	<25	<50	**230**	<100	<0.2	<0.5	<1	<1	**0.06**
BH109	0.015-0.1	Fill: Sandy Gravel	Coarse	**9.9**	**13**	NA	**5**	**17**	**28**	**13**	**18**	**590**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH109 - [LAB_DUP]	0.015-0.1	Laboratory Duplicate	Coarse	**9.9**	**13**	NA	**5**	**19**	**35**	**16**	**22**	**270**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH109 - [LAB_TRIP]	0.015-0.1	Laboratory Triplicate	Coarse	**9.9**	**13**	NA	**6**	**17**	**22**	**15**	**14**	**340**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH110	0.04-0.1	Fill: Sandy Gravel	Coarse	**9.9**	**23**	NA	<4	**8**	**91**	**16**	**8**	**41**	<1	<0.1	<25	<50	**120**	**220**	<0.2	<0.5	<1	<1	**0.1**
BH111	0-0.1	Fill: Silty Clay	Fine	NA	NA	NA	**7**	**18**	**8**	**29**	**5**	**32**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	**0.2**
BH112	0-0.1	Fill: Clayey Sand	Coarse	NA	NA	NA	<4	**14**	**34**	**14**	**15**	**38**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	**0.1**
BH113	0.1-0.3	Fill: Silty Clay	Fine	NA	NA	NA	**7**	**19**	**15**	**15**	**12**	**16**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH114	0-0.1	Fill: Silty Clay	Fine	**5.5**	**9**	NA	**14**	**20**	**49**	**100**	**4**	**220**	<1	<0.1	<25	<50	**110**	<100	<0.2	<0.5	<1	<1	<0.05
BH115	0-0.15	Fill: Clayey Sand	Coarse	NA	NA	NA	**7**	**16**	**7**	**33**	**3**	**76**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH116	0-0.1	Fill: Silty Clay	Fine	NA	NA	NA	**7**	**15**	**15**	**68**	**3**	**100**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	**0.05**
BH117	0-0.1	Fill: Silty Gravelly Clay	Fine	NA	NA	NA	**19**	**31**	**19**	**50**	**5**	**81**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	**0.1**
BH118	0-0.1	Fill: Clayey Gravelly Sand	Coarse	**6.8**	**9.2**	NA	**11**	**21**	**200**	**74**	**4**	**110**	<1	<0.1	<25	<50	**130**	<100	<0.2	<0.5	<1	<1	**0.07**
BH119	0-0.15	Fill: Silty Clay	Fine	NA	NA	NA	**10**	**22**	**31**	**120**	**14**	**140**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH120	0-0.1	Fill: Silty Clay	Fine	NA	NA	NA	**8**	**20**	**8**	**33**	**3**	**56**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH121	0-0.1	Fill: Silty Clay	Fine	**5.5**	**12**	NA	**10**	**27**	**31**	**94**	**5**	**230**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	**0.9**
BH122	0-0.1	Fill: Silty Clay	Fine	NA	NA	NA	**20**	**16**	**14**	**83**	**4**	**140**	<1	<0.1	<25	<50	**220**	<100	<0.2	<0.5	<1	<1	**0.1**
BH122 - [LAB_DUP]	0-0.1	Laboratory Duplicate	Fine	NA	NA	NA	**32**	**21**	**20**	**74**	**3**	**120**	<1	<0.1	<25	<50	**190**	<100	<0.2	<0.5	<1	<1	**0.1**
BH123	0-0.1	Fill: Silty Sandy Clay	Fine	NA	NA	NA	**4**	**10**	**20**	**23**	**3**	**98**	<1	<0.1	<25	**240**	**540**	**250**	<0.2	<0.5	<1	<1	**0.2**
BH123 - [LAB_DUP]	0-0.1	Laboratory Duplicate	Fine	NA	NA	NA	<4	**9**	**18**	**20**	**3**	**93**	<1	<0.1	<25	**220**	**510**	**290**	<0.2	<0.5	<1	<1	**0.1**
BH123_Silica Gel	0-0.1	Fill: Silty Sandy Clay	Fine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**130**	**130**	<100	NA	NA	NA	NA	NA
BH123_Silica Gel - [LAB_DUP]	0-0.1	Laboratory Duplicate	Fine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**160**	**110**	<100	NA	NA	NA	NA	NA
BH124	0-0.1	Fill: Silty Clay	Fine	NA	NA	NA	**9**	**18**	**7**	**57**	**3**	**73**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	**0.09**
SDUP1	0-0.1	Duplicate of BH1	Coarse	NA	NA	NA	<4	**20**	**43**	**38**	**14**	**100**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	**0.2**
SDUP3	0-0.1	Duplicate of BH102	Fine	NA	NA	NA	<4	**12**	**21**	**61**	**4**	**96**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	**0.2**
SDUP2	0-0.1	Duplicate of BH112	Coarse	NA	NA	NA	**9**	**22**	**15**	**17**	**10**	**32**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
SDUP4	0-0.1	Duplicate of BH108	Fine	NA	NA	NA	**10**	**24**	**9**	**40**	**14**	**110**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	NA	**0.09**
Total Number of Samples				7	7	0	40	40	40	40	40	40	38	38	38	40	40	40	38	38	38	37	39
Maximum Value				9.9	23	NA	32	31	200	120	34	590	<PQL	<PQL	<PQL	240	890	940	<PQL	<PQL	<PQL	<PQL	3

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	0-0.1	Fill: Sandy Gravel	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
BH1 - [LAB_DUP]	0-0.1	Laboratory Duplicate	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
BH1 - [LAB_TRIP]	0-0.1	Laboratory Triplicate	Coarse	NA	NA	NA	100	200	80	1200	35	150	--	--	--	--	--	--	--	--	--	--	--
BH2	0.1-0.4	Fill: Gravelly Sand	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
BH3	0.04-0.1	Fill: Sandy Gravel	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
BH4	0.04-0.3	Fill: Gravelly Sand	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
BH5	0.04-0.3	Fill: Gravelly Sand	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
BH7	0-0.1	Fill: Silty Clay	Fine	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	1300	5600	65	105	125	45	20
BH101	0-0.1	Fill: Silty Clay	Fine	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	1300	5600	65	105	125	45	20
BH102	0-0.1	Fill: Sandy Clay	Fine	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	1300	5600	65	105	125	45	20
BH103	0-0.1	Fill: Sandy Clay	Fine	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	1300	5600	65	105	125	45	20
BH104	0-0.2	Fill: Sandy Clay	Fine	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	1300	5600	65	105	125	45	20
BH105	0.02-0.1	Fill: Sandy Gravel	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
BH106	0.02-0.1	Fill: Sandy Gravel	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
BH107	0-0.1	Fill: Sandy Clay	Fine	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	1300	5600	65	105	125	45	20
BH107	0.3-0.45	Silty Clay	Fine	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	20
BH108	0-0.1	Fill: Silty Sandy Clay	Fine	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	1300	5600	65	105	125	45	20
BH109	0.015-0.1	Fill: Sandy Gravel	Coarse	9.9	13	NA	100	200	230	1200	280	780	170	180	180	120	300	2800	50	85	70	105	20
BH109 - [LAB_DUP]	0.015-0.1	Laboratory Duplicate	Coarse	9.9	13	NA	100	200	230	1200	280	780	170	180	180	120	300	2800	50	85	70	105	20
BH109 - [LAB_TRIP]	0.015-0.1	Laboratory Triplicate	Coarse	9.9	13	NA	100	200	230	1200	280	780	--	--	--	--	--	--	--	--	--	--	--
BH110	0.04-0.1	Fill: Sandy Gravel	Coarse	9.9	23	NA	100	200	240	1200	360	1000	170	180	180	120	300	2800	50	85	70	105	20
BH111	0-0.1	Fill: Silty Clay	Fine	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	1300	5600	65	105	125	45	20
BH112	0-0.1	Fill: Clayey Sand	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
BH113	0.1-0.3	Fill: Silty Clay	Fine	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	1300	5600	65	105	125	45	20
BH114	0-0.1	Fill: Silty Clay	Fine	5.5	9	NA	100	200	150	1200	180	350	170	180	180	120	1300	5600	65	105	125	45	20
BH115	0-0.15	Fill: Clayey Sand	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
BH116	0-0.1	Fill: Silty Clay	Fine	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	1300	5600	65	105	125	45	20
BH117	0-0.1	Fill: Silty Gravelly Clay	Fine	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	1300	5600	65	105	125	45	20
BH118	0-0.1	Fill: Clayey Gravelly Sand	Coarse	6.8	9.2	NA	100	200	210	1200	180	480	170	180	180	120	300	2800	50	85	70	105	20
BH119	0-0.15	Fill: Silty Clay	Fine	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	1300	5600	65	105	125	45	20
BH120	0-0.1	Fill: Silty Clay	Fine	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	1300	5600	65	105	125	45	20
BH121	0-0.1	Fill: Silty Clay	Fine	5.5	12	NA	100	200	150	1200	280	350	170	180	180	120	1300	5600	65	105	125	45	20
BH122	0-0.1	Fill: Silty Clay	Fine	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	1300	5600	65	105	125	45	20
BH122 - [LAB_DUP]	0-0.1	Laboratory Duplicate	Fine	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	1300	5600	65	105	125	45	20
BH123	0-0.1	Fill: Silty Sandy Clay	Fine	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	1300	5600	65	105	125	45	20
BH123 - [LAB_DUP]	0-0.1	Laboratory Duplicate	Fine	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	1300	5600	65	105	125	45	20
BH123_Silica Gel	0-0.1	Fill: Silty Sandy Clay	Fine	NA	NA	NA	--	--	--	--	--	--	--	--	--	120	1300	5600	--	--	--	--	--
BH123_Silica Gel - [LAB_DUP]	0-0.1	Laboratory Duplicate	Fine	NA	NA	NA	--	--	--	--	--	--	--	--	--	120	1300	5600	--	--	--	--	--
BH124	0-0.1	Fill: Silty Clay	Fine	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	1300	5600	65	105	125	45	20
SDUP1	0-0.1	Duplicate of BH1	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
SDUP3	0-0.1	Duplicate of BH102	Fine	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	1300	5600	65	105	125	45	20
SDUP2	0-0.1	Duplicate of BH112	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
SDUP4	0-0.1	Duplicate of BH108	Fine	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	1300	5600	65	105	125	--	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 PCBs	TRH					BTEX COMPOUNDS				ASBESTOS FIBRES
			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	B(a)P	Total Endosulfans	Chloropyrifos	Total Moderately Harmful	Total Scheduled		C_6-C_9	C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C_{36}	Total C_{10}-C_{36}	Benzene	Toluene	Ethyl benzene	Total Xylenes	
PQL - Envirolab Services			4	0.4	1	1	1	0.1	1	1	-	0.05	0.1	0.1	0.1	0.1	0.1	25	50	100	100	50	0.2	0.5	1	1	100
General Solid Waste CT1			100	20	100	NSL	100	4	40	NSL	200	0.8	60	4	250	50	50	650		NSL		10,000	10	288	600	1,000	-
General Solid Waste SCC1			500	100	1900	NSL	1500	50	1050	NSL	200	10	108	7.5	250	50	50	650		NSL		10,000	18	518	1,080	1,800	-
Restricted Solid Waste CT2			400	80	400	NSL	400	16	160	NSL	800	3.2	240	16	1000	50	50	2600		NSL		40,000	40	1,152	2,400	4,000	-
Restricted Solid Waste SCC2			2000	400	7600	NSL	6000	200	4200	NSL	800	23	432	30	1000	50	50	2600		NSL		40,000	72	2,073	4,320	7,200	-
Sample Reference	**Sample Depth**	**Sample Description**																									
BH1	0-0.1	Fill: Sandy Gravel	<4	<0.4	**26**	**26**	**41**	<0.1	**9**	**61**	**1.9**	**0.3**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Detected
BH1 - [LAB_DUP]	0-0.1	Laboratory Duplicate	**6**	<0.4	**20**	**25**	**27**	<0.1	**10**	**52**	**1.4**	**0.2**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH1 - [LAB_TRIP]	0-0.1	Laboratory Triplicate	**4**	<0.4	**15**	**23**	**28**	<0.1	**11**	**88**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH2	0.1-0.4	Fill: Gravelly Sand	**4**	<0.4	**10**	**16**	**7**	<0.1	**9**	**9**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	**220**	**220**	<0.2	<0.5	<1	<1	Not Detected
BH3	0.04-0.1	Fill: Sandy Gravel	**5**	<0.4	**12**	**34**	**6**	<0.1	**16**	**15**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	**220**	**600**	**820**	<0.2	<0.5	<1	<1	Not Detected
BH4	0.04-0.3	Fill: Gravelly Sand	<4	<0.4	**6**	**76**	**3**	<0.1	**34**	**24**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	**110**	**380**	**490**	<0.2	<0.5	<1	<1	Not Detected
BH5	0.04-0.3	Fill: Gravelly Sand	<4	<0.4	**10**	**13**	**23**	<0.1	**4**	**47**	**1.2**	**0.1**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH7	0-0.1	Fill: Silty Clay	**9**	<0.4	**22**	**14**	**22**	<0.1	**7**	**41**	**31**	**1.8**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH101	0-0.1	Fill: Silty Clay	**5**	<0.4	**14**	**2**	**12**	<0.1	**1**	**8**	**0.3**	**0.07**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH102	0-0.1	Fill: Sandy Clay	**4**	<0.4	**14**	**13**	**43**	<0.1	**3**	**61**	**0.64**	**0.1**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH103	0-0.1	Fill: Sandy Clay	<4	<0.4	**9**	**10**	**29**	<0.1	**3**	**52**	**0.3**	**0.05**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH104	0-0.2	Fill: Sandy Clay	**5**	<0.4	**16**	**8**	**32**	<0.1	**2**	**30**	**2.1**	**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
BH105	0.02-0.1	Fill: Sandy Gravel	<4	<0.4	**16**	**29**	**6**	<0.1	**24**	**22**	**0.4**	**0.1**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	**150**	**390**	**540**	<0.2	<0.5	<1	<1	Not Detected
BH106	0.02-0.1	Fill: Sandy Gravel	**4**	<0.4	**17**	**27**	**10**	<0.1	**23**	**42**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	**280**	**730**	**1010**	<0.2	<0.5	<1	<1	Not Detected
BH107	0-0.1	Fill: Sandy Clay	**10**	**0.5**	**19**	**27**	**58**	<0.1	**10**	**120**	**60**	**3**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	**170**	**110**	**280**	<0.2	<0.5	<1	<1	Not Detected
BH107	0.3-0.45	Silty Clay	NA	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH108	0-0.1	Fill: Silty Sandy Clay	<4	<0.4	**20**	**10**	**36**	<0.1	**13**	**130**	**0.3**	**0.06**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	**110**	**150**	**260**	<0.2	<0.5	<1	<1	Not Detected
BH109	0.015-0.1	Fill: Sandy Gravel	**5**	<0.4	**17**	**28**	**13**	<0.1	**18**	**590**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH109 - [LAB_DUP]	0.015-0.1	Laboratory Duplicate	**5**	<0.4	**19**	**35**	**16**	<0.1	**22**	**270**	<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
BH109 - [LAB_TRIP]	0.015-0.1	Laboratory Triplicate	**6**	<0.4	**17**	**22**	**15**	<0.1	**14**	**340**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH110	0.04-0.1	Fill: Sandy Gravel	<4	<0.4	**8**	**91**	**16**	<0.1	**8**	**41**	**0.5**	**0.1**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	**130**	**130**	<0.2	<0.5	<1	<1	Not Detected
BH111	0-0.1	Fill: Silty Clay	**7**	<0.4	**18**	**8**	**29**	<0.1	**5**	**32**	**1.6**	**0.2**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH112	0-0.1	Fill: Clayey Sand	<4	<0.4	**14**	**34**	**14**	<0.1	**15**	**38**	**0.4**	**0.1**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH113	0.1-0.3	Fill: Silty Clay	**7**	<0.4	**19**	**15**	**15**	<0.1	**12**	**16**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH114	0-0.1	Fill: Silty Clay	**14**	**0.5**	**20**	**49**	**100**	<0.1	**4**	**220**	<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
BH115	0-0.15	Fill: Clayey Sand	**7**	<0.4	**16**	**7**	**33**	<0.1	**3**	**76**	<0.05	<0.05	<0.1	<0.1	<0.1	**2**	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH116	0-0.1	Fill: Silty Clay	**7**	<0.4	**15**	**15**	**68**	<0.1	**3**	**100**	**0.2**	**0.05**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH117	0-0.1	Fill: Silty Gravelly Clay	**19**	<0.4	**31**	**19**	**50**	<0.1	**5**	**81**	**0.4**	**0.1**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Detected
BH118	0-0.1	Fill: Clayey Gravelly Sand	**11**	<0.4	**21**	**200**	**74**	<0.1	**4**	**110**	**0.5**	**0.07**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH119	0-0.15	Fill: Silty Clay	**10**	<0.4	**22**	**31**	**120**	<0.1	**14**	**140**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH120	0-0.1	Fill: Silty Clay	**8**	<0.4	**20**	**8**	**33**	**0.4**	**3**	**56**	<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	Detected
BH121	0-0.1	Fill: Silty Clay	**10**	**0.6**	**27**	**31**	**94**	**0.1**	**5**	**230**	**9.1**	**0.9**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH122	0-0.1	Fill: Silty Clay	**20**	<0.4	**16**	**14**	**83**	<0.1	**4**	**140**	**1.6**	**0.1**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	**120**	**140**	**260**	<0.2	<0.5	<1	<1	Detected
BH122 - [LAB_DUP]	0-0.1	Laboratory Duplicate	**32**	<0.4	**21**	**20**	**74**	<0.1	**3**	**120**	**0.9**	**0.1**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	**100**	**120**	**220**	<0.2	<0.5	<1	<1	NA
BH123	0-0.1	Fill: Silty Sandy Clay	**4**	<0.4	**10**	**20**	**23**	<0.1	**3**	**98**	**2.1**	**0.2**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	**84**	**500**	**320**	**904**	<0.2	<0.5	<1	<1	Not Detected
BH123 - [LAB_DUP]	0-0.1	Laboratory Duplicate	<4	<0.4	**9**	**18**	**20**	<0.1	**3**	**93**	**1.1**	**0.1**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	**81**	**430**	**330**	**841**	<0.2	<0.5	<1	<1	NA
BH123_Silica Gel	0-0.1	Fill: Silty Sandy Clay	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**54**	**170**	**100**	**324**	NA	NA	NA	NA	NA
BH123_Silica Gel - [LAB_DUP]	0-0.1	Laboratory Duplicate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**50**	**200**	<100	**250**	NA	NA	NA	NA	NA
BH124	0-0.1	Fill: Silty Clay	**9**	<0.4	**18**	**7**	**57**	<0.1	**3**	**73**	**0.51**	**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
SDUP1	0-0.1	Duplicate of BH1	<4	<0.4	**20**	**43**	**38**	<0.1	**14**	**100**	**1.5**	**0.2**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
SDUP3	0-0.1	Duplicate of BH102	<4	<0.4	**12**	**21**	**61**	<0.1	**4**	**96**	**1**	**0.2**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
SDUP2	0-0.1	Duplicate of BH112	**9**	<0.4	**22**	**15**	**17**	<0.1	**10**	**32**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
SDUP4	0-0.1	Duplicate of BH108	**10**	<0.4	**24**	**9**	**40**	**0.2**	**14**	**110**	**0.35**	**0.09**	<0.1	<0.1	<0.1	<0.1	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	NA	Not Detected
FCF1	Surface	Fragment	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Detected
FCF1-BH116	0-0.1	Fragment	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Detected
FCF1-BH118	0-0.1	Fragment	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Detected
FCF1-BH121	0-0.1	Fragment	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Detected
FCF3-BH122	0-0.1	Fragment	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Detected
Total Number of Samples			40	40	40	40	40	40	40	40	39	39	38	38	38	38	37	38	40	40	40	40	38	38	38	37	36
Maximum Value			32	0.6	31	200	120	0.4	34	590	60	3	<PQL	<PQL	<PQL	2	<PQL	<PQL	84	500	730	1010	<PQL	<PQL	<PQL	<PQL	Detected

Concentration above the CT1 — VALUE
Concentration above SCC1 — VALUE
Concentration above the SCC2 — VALUE
Concentration above PQL — Bold
Asbestos Detected > Special Waste (asbestos) — Detected

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

			Lead	B(a)P
PQL - Envirolab Services			0.03	0.001
TCLP1 - General Solid Waste			5	0.04
TCLP2 - Restricted Solid Waste			20	0.16
TCLP3 - Hazardous Waste			>20	>0.16
Sample Reference	**Sample Depth**	**Sample Description**		
BH7	0-0.1	F: Silty Clay	NA	<0.001
BH107	0-0.1	F: Sandy Clay	NA	<0.001
BH119	0-0.15	F: Silty Clay	<0.03	NA
BH121	0-0.1	F: Silty Clay	NA	<0.001
Total Number of samples			1	3
Maximum Value			<PQL	<PQL

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

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TABLE S9
SUMMARY OF PFAS CONCENTRATIONS IN SOIL - ECOLOGY
Units are µg/Kg unless stated otherwise.

	PQL Envirolab Services	NEMP 2020 Indirect exposure All land use	BH102 0-0.1 Fill: Sandy Clay	BH104 0-0.2 Fill: Sandy Clay	BH109 0.015-0.1 Fill: Sandy Gravel	BH109 - [LAB DUP] 0.015-0.1 Lab Duplicate	BH116 0-0.1 Fill: Silty Clay	BH118 0-0.1 Fill: Clayey Gravelly Sand	BH122 0-0.1 Fill: Silty Clay	BH122 - [LAB DUP] 0-0.1 Lab Duplicate	SDUP6 0-0.1 Duplicate of BH116	SDUP3 0-0.1 Duplicate of BH102
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
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
Perfluorohexanesulfonic acid - PFHxS	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
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
Perfluorooctanesulfonic acid PFOS	0.1	10	**5.7**	**4.5**	**0.2**	**0.1**	**1.6**	**0.9**	**0.9**	**0.9**	**1.9**	**5.4**
Perfluorodecanesulfonic acid	0.2	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Perfluorobutanoic acid	0.2	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Perfluoropentanoic acid	0.2	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Perfluorohexanoic acid	0.1	NSL	**0.1**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1
Perfluoroheptanoic acid	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorooctanoic acid PFOA	0.1	NSL	**0.3**	**0.3**	<0.1	<0.1	**0.1**	**0.1**	**0.1**	**<0.1**	**0.2**	**0.4**
Perfluorononanoic acid	0.1	NSL	**0.2**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**0.2**
Perfluorodecanoic acid	0.5	NSL	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**0.6**
Perfluoroundecanoic acid	0.5	NSL	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Perfluorododecanoic acid	0.5	NSL	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
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
Perfluorotetradecanoic acid	5	NSL	<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
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
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
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
Perfluorooctane sulfonamide	1	NSL	<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
N-Ethyl perfluorooctanesulfon amide	1	NSL	<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
N-Et perfluorooctanesulfonamid oethanol	5	NSL	<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
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
Total Positive PFHxS & PFOS	0.1	NSL	**5.7**	**4.5**	**0.2**	**0.1**	**1.6**	**0.9**	**0.9**	**0.9**	**1.9**	**5.4**
Total Positive PFOS & PFOA	0.1	NSL	**6**	**4.8**	**0.2**	**0.1**	**1.8**	**1**	**1**	**0.9**	**2.1**	**5.8**
Total Positive PFAS	0.1	NSL	**6.3**	**4.8**	**0.2**	**0.1**	**1.8**	**1**	**1**	**0.9**	**2.1**	**6.7**

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

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TABLE S10
SUMMARY OF PFAS CONCENTRATIONS IN SOIL - HUMAN HEALTH
Units are µg/Kg unless stated otherwise.

	PQL Envirolab Services	NEMP 2020 Residential accessible soil	BH102 0-0.1 Fill: Sandy Clay	BH104 0-0.2 Fill: Sandy Clay	BH109 0.015-0.1 Fill: Sandy Gravel	BH109 - [LAB DUP] 0.015-0.1 Lab Duplicate	BH116 0-0.1 Fill: Silty Clay	BH118 0-0.1 Fill: Clayey Gravelly Sand	BH122 0-0.1 Fill: Silty Clay	BH122 - [LAB DUP] 0-0.1 Lab Duplicate	SDUP6 0-0.1 Duplicate of BH116	SDUP3 0-0.1 Duplicate of BH102
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
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
Perfluorohexanesulfonic acid - PFHxS	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
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
Perfluorooctanesulfonic acid PFOS	0.1	NSL	**5.7**	**4.5**	**0.2**	**0.1**	**1.6**	**0.9**	**0.9**	**0.9**	**1.9**	**5.4**
Perfluorodecanesulfonic acid	0.2	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Perfluorobutanoic acid	0.2	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Perfluoropentanoic acid	0.2	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Perfluorohexanoic acid	0.1	NSL	**0.1**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**0.1**
Perfluoroheptanoic acid	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorooctanoic acid PFOA	0.1	300	**0.3**	**0.3**	<0.1	<0.1	**0.1**	**0.1**	**0.1**	<0.1	**0.2**	**0.4**
Perfluorononanoic acid	0.1	NSL	**0.2**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**0.2**
Perfluorodecanoic acid	0.5	NSL	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**0.6**
Perfluoroundecanoic acid	0.5	NSL	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Perfluorododecanoic acid	0.5	NSL	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
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
Perfluorotetradecanoic acid	5	NSL	<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
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
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
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
Perfluorooctane sulfonamide	1	NSL	<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
N-Ethyl perfluorooctanesulfon amide	1	NSL	<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
N-Et perfluorooctanesulfonamid oethanol	5	NSL	<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
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
Total Positive PFHxS & PFOS	0.1	10	**5.7**	**4.5**	**0.2**	**0.1**	**1.6**	**0.9**	**0.9**	**0.9**	**1.9**	**5.4**
Total Positive PFOS & PFOA	0.1	NSL	**6**	**4.8**	**0.2**	**0.1**	**1.8**	**1**	**1**	**0.9**	**2.1**	**5.8**
Total Positive PFAS	0.1	NSL	**6.3**	**4.8**	**0.2**	**0.1**	**1.8**	**1**	**1**	**0.9**	**2.1**	**6.7**

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

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TABLE S11
SUMMARY OF PFAS CONCENTRATIONS IN SOIL - WASTE CLASSIFICATION
Units are µg/Kg unless stated otherwise.

	PQL Envirolab Services	SCC1	SCC2	BH102 0-0.1 Fill: Sandy Clay	BH104 0-0.2 Fill: Sandy Clay	BH109 0.015-0.1 Fill: Sandy Gravel	BH109 - [LAB DUP] 0.015-0.1 Lab Duplicate	BH116 0-0.1 Fill: Silty Clay	BH118 0-0.1 Fill: Clayey Gravelly Sand	BH122 0-0.1 Fill: Silty Clay	BH122 - [LAB DUP] 0-0.1 Lab Duplicate	SDUP6 0-0.1 Duplicate of BH116	SDUP3 0-0.1 Duplicate of BH102
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
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
Perfluorohexanesulfonic acid - PFHxS	0.1	NSL	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
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
Perfluorooctanesulfonic acid PFOS	0.1	NSL	NSL	**5.7**	**4.5**	**0.2**	**0.1**	**1.6**	**0.9**	**0.9**	**0.9**	**1.9**	**5.4**
Perfluorodecanesulfonic 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
Perfluorobutanoic 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
Perfluoropentanoic 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
Perfluorohexanoic 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**
Perfluoroheptanoic 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
Perfluorooctanoic acid PFOA	0.1	18,000	72,000	**0.3**	**0.3**	<0.1	<0.1	**0.1**	**0.1**	**0.1**	<0.1	**0.2**	**0.4**
Perfluorononanoic acid	0.1	NSL	NSL	**0.2**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**0.2**
Perfluorodecanoic acid	0.5	NSL	NSL	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**0.6**
Perfluoroundecanoic 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
Perfluorododecanoic 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
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
Perfluorotetradecanoic acid	5	NSL	NSL	<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
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
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
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
Perfluorooctane sulfonamide	1	NSL	NSL	<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
N-Ethyl perfluorooctanesulfon amide	1	NSL	NSL	<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
N-Et perfluorooctanesulfonamid oethanol	5	NSL	NSL	<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
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
Total Positive PFHxS & PFOS	0.1	1800	7,200	**5.7**	**4.5**	**0.2**	**0.1**	**1.6**	**0.9**	**0.9**	**0.9**	**1.9**	**5.4**
Total Positive PFOS & PFOA	0.1	NSL	NSL	**6**	**4.8**	**0.2**	**0.1**	**1.8**	**1**	**1**	**0.9**	**2.1**	**5.8**
Total Positive PFAS	0.1	NSL	NSL	**6.3**	**4.8**	**0.2**	**0.1**	**1.8**	**1**	**1**	**0.9**	**2.1**	**6.7**

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

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TABLE S12
SUMMARY OF PFAS CONCENTRATIONS IN TCLP LEACHATE - WASTE CLASSIFICATION
Units are µg/L unless stated otherwise.

	PQL Envirolab Services	TCLP1	TCLP2	BH102 0-0.1	BH104 0-0.2	BH109 0.015-0.1	BH109 0.015-0.1	BH116 0-0.1	BH118 0-0.1	BH122 0-0.1
PFAS Compound										
Perfluorobutanesulfonic acid	0.01	NSL	NSL	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoropentanesulfonic acid	0.01	NSL	NSL	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorohexanesulfonic acid - PFHxS	0.01	NSL	NSL	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptanesulfonic acid	0.01	NSL	NSL	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctanesulfonic acid PFOS	0.01	NSL	NSL	**0.02**	**0.03**	**0.01**	**0.01**	<0.01	<0.01	<0.01
Perfluorodecanesulfonic acid	0.02	NSL	NSL	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorobutanoic acid	0.02	NSL	NSL	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentanoic acid	0.02	NSL	NSL	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid	0.01	NSL	NSL	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptanoic acid	0.01	NSL	NSL	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctanoic acid PFOA	0.01	500	2,000	<0.01	**0.01**	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid	0.01	NSL	NSL	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecanoic acid	0.02	NSL	NSL	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid	0.02	NSL	NSL	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid	0.05	NSL	NSL	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorotridecanoic acid	0.1	NSL	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorotetradecanoic acid	0.5	NSL	NSL	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
4:2 FTS	0.01	NSL	NSL	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
6:2 FTS	0.01	NSL	NSL	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
8:2 FTS	0.02	NSL	NSL	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
10:2 FTS	0.02	NSL	NSL	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonamide	0.1	NSL	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
N-Methyl perfluorooctane sulfonamide	0.05	NSL	NSL	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctanesulfon amide	0.1	NSL	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
N-Me perfluorooctanesulfonamid oethanol	0.05	NSL	NSL	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Et perfluorooctanesulfonamid oethanol	0.5	NSL	NSL	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MePerfluorooctanesulf-amid oacetic acid	0.02	NSL	NSL	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
EtPerfluorooctanesulf-amid oacetic acid	0.02	NSL	NSL	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Positive PFHxS & PFOS	0.01	50	200	**0.02**	**0.03**	**0.01**	**0.01**	<0.01	<0.01	<0.01
Total Positive PFOS & PFOA	0.01	NSL	NSL	**0.02**	**0.05**	**0.01**	**0.01**	<0.01	<0.01	<0.01
Total Positive PFAS	0.01	NSL	NSL	**0.02**	**0.05**	**0.01**	**0.01**	<0.01	<0.01	<0.01

Result above TCLP1 Criteria **Bold**
Result above TCLP2 Criteria **Bold**

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TABLE S13
SUMMARY OF SOIL LABORATORY RESULTS - EC and ECe

Borehole Number	Sample Depth (m)	Sample Description	EC (µS/cm)	ECe (dS/m)	Salinity Class
BH1	0.5-0.7	Silty Clay	120	<2	NON SALINE
BH1	1.8-2.0	XW Sandstone	93	<2	NON SALINE
BH1	4.5-4.7	Laminite	34	<2	NON SALINE
BH3	0.4-0.5	Silty Clay	62	<2	NON SALINE
BH3	2.4-2.5	Sandstone	16	<2	NON SALINE
BH3	6.3-6.5	Sandstone	24	<2	NON SALINE
BH5	0.5-0.95	Silty Clay	56	<2	NON SALINE
BH5	1.5-1.7	XW Sandstone	47	<2	NON SALINE
BH5	3.3-3.5	Laminite	32	<2	NON SALINE
BH6	2.7-3.0	Sandstone	40	<2	NON SALINE
BH7	0.5-0.7	Fill: Silty Clay	44	<2	NON SALINE
BH7	1.0-1.2	Silty Clay	52	<2	NON SALINE
BH7	3.3-3.6	Sandstone	34	<2	NON SALINE
BH7 - [LAB_DUP]	3.3-3.6	Laboratory Duplicate	32	<2	NON SALINE
BH8	0.7-0.9	Silty Clay	41	<2	NON SALINE
BH8	2.6-2.8	XW Sandstone	64	<2	NON SALINE
Total Number of Samples			16	16	-
Minimum Value			16	<PQL	-
Maximum Value			120	<PQL	-

ECe Values (dS/m)	Salinity Class
<2	NON SALINE
2 to 4	SLIGHTLY SALINE
4 to 8	MODERATELY SALINE
8 to 16	VERY SALINE
>16	HIGHLY SALINE

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TABLE S14
SUMMARY OF RESISTIVITY CALCULATION ON SOIL EC RESULTS

Borehole Number	Sample Depth (m)	Sample Description	EC (µS/cm)	Resistivity (ohm.cm)	Classification Condition B
BH1	0.5-0.7	Silty Clay	120	8,333	Non Aggressive
BH1	1.8-2.0	XW Sandstone	93	10,753	Non Aggressive
BH1	4.5-4.7	Laminite	34	29,412	Non Aggressive
BH3	0.4-0.5	Silty Clay	62	16,129	Non Aggressive
BH3	2.4-2.5	Sandstone	16	62,500	Non Aggressive
BH3	6.3-6.5	Sandstone	24	41,667	Non Aggressive
BH5	0.5-0.95	Silty Clay	56	17,857	Non Aggressive
BH5	1.5-1.7	XW Sandstone	47	21,277	Non Aggressive
BH5	3.3-3.5	Laminite	32	31,250	Non Aggressive
BH6	2.7-3.0	Sandstone	40	25,000	Non Aggressive
BH7	0.5-0.7	Fill: Silty Clay	44	22,727	Non Aggressive
BH7	1.0-1.2	Silty Clay	52	19,231	Non Aggressive
BH7	3.3-3.6	Sandstone	34	29,412	Non Aggressive
BH7 - [LAB_DUP]	3.3-3.6	Laboratory Duplicate	32	31,250	Non Aggressive
BH8	0.7-0.9	Silty Clay	41	24,390	Non Aggressive
BH8	2.6-2.8	XW Sandstone	64	15,625	Non Aggressive
Total Number of Samples			16	16	-
Minimum Value			16	8,333	-
Maximum Value			120	62,500	-

Classification is based on Soil condition 'B' - low permeability soils (e.g. silts & clays) or all soils above groundwater.

Resistivity Values (ohm.cm)	Classification for Steel Piles
>5,000	Non-Aggressive
2,000 - 5,000	Non-Aggressive
1,000 - 2,000	Mildly Aggressive
<1,000	Moderately Aggressive

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TABLE S15
SUMMARY OF SOIL LABORATORY RESULTS - pH

Borehole Number	Sample Depth (m)	Sample Description	pH	Classification for Concrete Piles Condition B	Classification for Steel Piles Condition B
BH1	0.5-0.7	Silty Clay	4.4	Moderately Aggressive	Non-Aggressive
BH1 - [LAB_DUP]	0.5-0.7	Laboratory Duplicate	4.5	Moderately Aggressive	Non-Aggressive
BH1	1.8-2.0	XW Sandstone	4.5	Moderately Aggressive	Non-Aggressive
BH1	4.5-4.7	Laminite	6.2	Non-Aggressive	Non-Aggressive
BH3	0.4-0.5	Silty Clay	5.8	Non-Aggressive	Non-Aggressive
BH3	2.4-2.5	Sandstone	5.7	Non-Aggressive	Non-Aggressive
BH3	6.3-6.5	Sandstone	6.1	Non-Aggressive	Non-Aggressive
BH5	0.5-0.95	Silty Clay	4.9	Mildly Aggressive	Non-Aggressive
BH5	1.5-1.7	XW Sandstone	5.6	Non-Aggressive	Non-Aggressive
BH5	3.3-3.5	Laminite	5.9	Non-Aggressive	Non-Aggressive
BH6	2.7-3.0	Sandstone	6	Non-Aggressive	Non-Aggressive
BH7	0.5-0.7	Fill: Silty Clay	6.6	Non-Aggressive	Non-Aggressive
BH7	1.0-1.2	Silty Clay	5.8	Non-Aggressive	Non-Aggressive
BH7	3.3-3.6	Sandstone	6.4	Non-Aggressive	Non-Aggressive
BH7 - [LAB_DUP]	3.3-3.6	Laboratory Duplicate	6.4	Non-Aggressive	Non-Aggressive
BH8	0.7-0.9	Silty Clay	5.8	Non-Aggressive	Non-Aggressive
BH8	2.6-2.8	XW Sandstone	5.5	Mildly Aggressive	Non-Aggressive
BH110	0.04-0.1	Fill: Sandy Gravel	9.9	Non-Aggressive	Non-Aggressive
BH118	0-0.1	Fill: Clayey Gravelly Sand	6.8	Non-Aggressive	Non-Aggressive
Total Number of Samples			19	-	-
Minimum Value			4.4	-	-
Maximum Value			9.9	-	-

Classification is based on Soil condition 'B' - low permeability soils (e.g. silts & clays) or all soils above groundwater.

	Classification for Concrete Piles
>5.5	Non-Aggressive
4.5 - 5.5	Mildly Aggressive
4 - 4.5	Moderately Aggressive
<4	Severely Aggressive

pH Value	Classification for Steel Piles
>5	Non-Aggressive
4.0 - 5.0	Non-Aggressive
3.0 - 4.0	Mildly Aggressive
<3	Moderately Aggressive

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TABLE S16
SUMMARY OF SOIL LABORATORY RESULTS - SULPHATE & CHLORIDES

Borehole Number	Sample Depth (m)	Sample Description	Chloride (mg/kg)	Sulphate (mg/kg)	Classification for Concrete Piles Sulfate - Condition B	Classification for Steel Piles Chloride - Condition B
BH1	0.5-0.7	Silty Clay	<10	180	Non-Aggressive	Non-Aggressive
BH1 - [LAB_DUP]	0.5-0.7	Laboratory Duplicate	<10	220	Non-Aggressive	Non-Aggressive
BH1	1.8-2.0	XW Sandstone	<10	140	Non-Aggressive	Non-Aggressive
BH1	4.5-4.7	Laminite	10	27	Non-Aggressive	Non-Aggressive
BH3	0.4-0.5	Silty Clay	10	61	Non-Aggressive	Non-Aggressive
BH3	2.4-2.5	Sandstone	24	20	Non-Aggressive	Non-Aggressive
BH3	6.3-6.5	Sandstone	<10	23	Non-Aggressive	Non-Aggressive
BH5	0.5-0.95	Silty Clay	21	10	Non-Aggressive	Non-Aggressive
BH5	1.5-1.7	XW Sandstone	38	24	Non-Aggressive	Non-Aggressive
BH5	3.3-3.5	Laminite	10	27	Non-Aggressive	Non-Aggressive
BH6	2.7-3.0	Sandstone	20	31	Non-Aggressive	Non-Aggressive
BH7	0.5-0.7	Fill: Silty Clay	<10	20	Non-Aggressive	Non-Aggressive
BH7	1.0-1.2	Silty Clay	<10	61	Non-Aggressive	Non-Aggressive
BH7	3.3-3.6	Sandstone	<10	33	Non-Aggressive	Non-Aggressive
BH7 - [LAB_DUP]	3.3-3.6	Laboratory Duplicate	<10	34	Non-Aggressive	Non-Aggressive
BH8	0.7-0.9	Silty Clay	<10	49	Non-Aggressive	Non-Aggressive
BH8	2.6-2.8	XW Sandstone	41	42	Non-Aggressive	Non-Aggressive
Total Number of Samples			17	17	-	-
Minimum Value			<PQL	10	-	-
Maximum Value			41	220	-	-

Classification is based on Soil condition 'B' - low permeability soils (e.g. silts & clays) or all soils above groundwater.

Sulfate Values	Classification for Concrete Piles
<5,000	Non-Aggressive
5,000 - 10,000	Mildly Aggressive
10,000 - 20,000	Moderately Aggressive
>20,000	Severely Aggressive

Chloride Values	Classification for Steel Piles
<5,000	Non-Aggressive
5,000 - 20,000	Non-Aggressive
20,000 - 50,000	Mildly Aggressive
>50,000	Moderately Aggressive

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TABLE S17
SUMMARY OF SOIL LABORATORY RESULTS - CEC & ESP

Borehole Number	Sample Depth (m)	Sample Description	Exchangeable Ca	Exchangeable K	Exchangeable Mg	Exchangeable Na	CEC	ESP	Ca:Mg
			(meq/100g)					%	
BH1	0.5-0.7	Silty Clay	2.4	<0.1	4.9	<0.1	7.5	1.3%	0.49:1
BH3	0.4-0.5	Silty Clay	0.7	0.2	8.9	0.5	10	5%	0.08:1
BH7	0.5-0.7	Fill: Silty Clay	4.3	<0.1	2.6	<0.1	7.1	1.4%	1.65:1
BH8	0.7-0.9	Silty Clay	0.6	0.2	7	0.5	8.3	6%	0.09:1
BH109	0.015-0.1	Fill: Sandy Gravel	9.3	0.2	3.1	0.3	13	2.3%	3:1
BH110	0.04-0.1	Fill: Sandy Gravel	23	0.1	0.2	<0.1	23	0.4%	115:1
BH118	0-0.1	Fill: Clayey Gravelly Sand	7.9	0.3	1.1	<0.1	9.2	1.1%	7.18:1
BH121	0-0.1	Fill: Silty Clay	10	0.3	1.6	<0.1	12	0.8%	6.25:1
Total Number of Samples			8	8	8	8	8	8	8
Minimum Value			0.6	<PQL	0.2	<PQL	7.1	0.4%	0.08 :1
Maximum Value			23	0.3	8.9	0.5	23	6%	115 :1

ESP Value	Sodicity Rating
< 5%	Non-Sodic
5% to 15%	Sodic
> 15%	Highly Sodic

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TABLE S18
SUMMARY OF LABORATORY RESULTS - ACID SULFATE SOIL ANALYSIS

Soil Texture: Coarse		Analysis	pH_F and pH_{FOX}				pH_{KCL}	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}		(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	0-0.1	Fill: Sandy Gravel	8.3	7.5	High reaction	0.8	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH1	0.8-1.0	Silty Clay	5	6.4	Low reaction	-1.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH1	1.3-1.5	Silty Clay	4.3	3.6	Low reaction	0.7	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH1	2.8-3.0	Sandstone	4.7	3.9	Low reaction	0.8	4.3	38	<0.005	<3	<0.005	[NT]	41	0.065	3.1
BH1	4.5-4.7	Laminite	5.3	4.2	Low reaction	1.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH1	5.4-5.6	Sandstone	5.1	4.2	Low reaction	0.9	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH3	0.4-0.5	Silty Clay	5.8	4.7	Low reaction	1.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH3	0.8-0.95	Silty Clay	5.4	4.2	Low reaction	1.2	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH3	1.9-2.0	XW Sandstone	5	3.9	Low reaction	1.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH3	3.4-3.5	Sandstone	5.3	4.1	Low reaction	1.2	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH3	3.9-4.0	Sandstone	5.3	3.9	Low reaction	1.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH3	6.3-6.5	Sandstone	5.4	4.2	Low reaction	1.2	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH5	0.5-0.95	Silty Clay	4.6	3.8	Low reaction	0.8	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH5	1.3-1.5	Silty Clay	4.7	3.5	Low reaction	1.2	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH5	1.8-2.0	XW Sandstone	5.1	3.9	Low reaction	1.2	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH5	2.8-3.0	Laminite	5.4	3.3	Low reaction	2.1	4.4	26	<0.005	<3	0.005	[NT]	31	0.049	2.3
BH5	3.3-3.5	Laminite	5.3	3.9	Low reaction	1.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH6	2.7-3.0	Sandstone	6.8	4.8	Low reaction	2	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH7	0.5-0.7	Fill: Silty Clay	7.8	5.8	Low reaction	2	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH7	1.0-1.2	Silty Clay	7.8	4.4	Low reaction	3.4	4.2	83	<0.005	<3	<0.005	[NT]	86	0.14	6.5
BH7	2.8-3.0	XW Sandstone	6.4	5	Low reaction	1.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH7	3.3-3.6	Sandstone	6.2	4.3	Low reaction	1.9	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH8	0.7-0.9	Silty Clay	7.3	4.2	Low reaction	3.1	4.3	31	0.005	3	<0.005	[NT]	37	0.059	2.8
BH8	1.7-2.0	Silty Clay	5.9	4.2	Low reaction	1.7	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH8	2.6-2.8	XW Sandstone	5.9	4.8	Low reaction	1.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH8	3.5-3.7	Sandstone	5.9	4.7	Low reaction	1.2	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Number of Samples			26	26	-	26	4	4	4	4	4	4	4	4	4
Minimum Value			4.3	3.3	-	-1.4	4.2	26	<PQL	<PQL	<PQL	<PQL	31	0.049	2.3
Maximum Value			8.3	7.5	-	3.4	4.4	83	0.005	3	0.005	<PQL	86	0.14	6.5

Values Exceeding Action Criteria

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

	PQL Envirolab Services	ANZG 2018 Marine Waters	SAMPLES MW1	MW1 [LAB_DUP]	MW3	MW6	WDUP1	WDUP2
Inorganic Compounds and Parameters								
pH	-	7 - 8.5	5.3	NA	5.2	5.6	NA	NA
Electrical Conductivity (µS/cm)	1	NSL	**1300**	NA	**200**	**1400**	NA	NA
Chloride (mg/L)	1	NSL	**130**	NA	**27**	**510**	NA	NA
Sulphate (mg/L)	1	NSL	**340**	NA	**35**	**87**	NA	NA
Metals and Metalloids								
Arsenic (As III)	1	2.3	<1	[NT]	<1	<1	<1	<1
Cadmium	0.1	0.7	<0.1	[NT]	<0.1	<0.1	<0.1	<0.1
Chromium (SAC for Cr III adopted)	1	27	<1	[NT]	<1	<1	<1	<1
Copper	1	1.3	**2**	[NT]	**1**	**1**	**2**	**1**
Lead	1	4.4	<1	[NT]	<1	<1	<1	<1
Total Mercury (inorganic)	0.05	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel	1	7	**3**	[NT]	<1	**13**	**3**	<1
Zinc	1	15	**14**	[NT]	**6**	**71**	**14**	**4**
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)								
Benzene	1	500	<1	<1	<1	<1	<1	<1
Toluene	1	180	<1	<1	<1	<1	<1	<1
Ethylbenzene	1	5	<1	<1	<1	<1	<1	<1
m+p-xylene	2	75	<2	<2	<2	<2	<2	<2
o-xylene	1	350	<1	<1	<1	<1	<1	<1
Total xylenes	2	NSL	<2	<2	<2	<2	<2	<2
Total Recoverable Hydrocarbons (TRHs)								
TRH F1	10	NSL	<10	<10	<10	<10	<10	<10
TRH F2	50	NSL	<50	<50	<50	<50	<50	<50
TRH F3	100	NSL	<100	<100	<100	<100	<100	<100
TRH F4	100	NSL	<100	<100	<100	<100	<100	<100
Volatile Organic Compounds (VOCs), including chlorinated VOCs								
Dichlorodifluoromethane	10	NSL	<10	<10	<10	<10	<10	<10
Chloromethane	10	NSL	<10	<10	<10	<10	<10	<10
Vinyl Chloride	10	100	<10	<10	<10	<10	<10	<10
Bromomethane	10	NSL	<10	<10	<10	<10	<10	<10
Chloroethane	10	NSL	<10	<10	<10	<10	<10	<10
Trichlorofluoromethane	10	NSL	<10	<10	<10	<10	<10	<10
1,1-Dichloroethene	1	700	<1	<1	<1	<1	<1	<1
Trans-1,2-dichloroethene	1	NSL	<1	<1	<1	<1	<1	<1
1,1-dichloroethane	1	250	<1	<1	<1	<1	<1	<1
Cis-1,2-dichloroethene	1	NSL	<1	<1	<1	<1	<1	<1
Bromochloromethane	1	NSL	<1	<1	<1	<1	<1	<1
Chloroform	1	370	<1	<1	<1	<1	<1	<1
2,2-dichloropropane	1	NSL	<1	<1	<1	<1	<1	<1
1,2-dichloroethane	1	1900	<1	<1	<1	<1	<1	<1
1,1,1-trichloroethane	1	270	<1	<1	<1	<1	<1	<1
1,1-dichloropropene	1	NSL	<1	<1	<1	<1	<1	<1
Cyclohexane	1	NSL	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	1	240	<1	<1	<1	<1	<1	<1
Benzene	1	500	<1	<1	<1	<1	<1	<1
Dibromomethane	1	NSL	<1	<1	<1	<1	<1	<1
1,2-dichloropropane	1	900	<1	<1	<1	<1	<1	<1
Trichloroethene	1	330	<1	<1	<1	<1	<1	<1
Bromodichloromethane	1	NSL	<1	<1	<1	<1	<1	<1
trans-1,3-dichloropropene	1	NSL	<1	<1	<1	<1	<1	<1
cis-1,3-dichloropropene	1	NSL	<1	<1	<1	<1	<1	<1
1,1,2-trichloroethane	1	1900	<1	<1	<1	<1	<1	<1
Toluene	1	180	<1	<1	<1	<1	<1	<1
1,3-dichloropropane	1	1100	<1	<1	<1	<1	<1	<1
Dibromochloromethane	1	NSL	<1	<1	<1	<1	<1	<1
1,2-dibromoethane	1	NSL	<1	<1	<1	<1	<1	<1
Tetrachloroethene	1	70	<1	<1	<1	<1	<1	<1
1,1,1,2-tetrachloroethane	1	NSL	<1	<1	<1	<1	<1	<1
Chlorobenzene	1	55	<1	<1	<1	<1	<1	<1
Ethylbenzene	1	5	<1	<1	<1	<1	<1	<1
Bromoform	1	NSL	<1	<1	<1	<1	<1	<1
m+p-xylene	2	75	<2	<2	<2	<2	<2	<2
Styrene	1	NSL	<1	<1	<1	<1	<1	<1
1,1,2,2-tetrachloroethane	1	400	<1	<1	<1	<1	<1	<1
o-xylene	1	350	<1	<1	<1	<1	<1	<1
1,2,3-trichloropropane	1	NSL	<1	<1	<1	<1	<1	<1
Isopropylbenzene	1	30	<1	<1	<1	<1	<1	<1
Bromobenzene	1	NSL	<1	<1	<1	<1	<1	<1
n-propyl benzene	1	NSL	<1	<1	<1	<1	<1	<1
2-chlorotoluene	1	NSL	<1	<1	<1	<1	<1	<1
4-chlorotoluene	1	NSL	<1	<1	<1	<1	<1	<1
1,3,5-trimethyl benzene	1	NSL	<1	<1	<1	<1	<1	<1
Tert-butyl benzene	1	NSL	<1	<1	<1	<1	<1	<1
1,2,4-trimethyl benzene	1	NSL	<1	<1	<1	<1	<1	<1
1,3-dichlorobenzene	1	260	<1	<1	<1	<1	<1	<1
Sec-butyl benzene	1	NSL	<1	<1	<1	<1	<1	<1
1,4-dichlorobenzene	1	60	<1	<1	<1	<1	<1	<1
4-isopropyl toluene	1	NSL	<1	<1	<1	<1	<1	<1
1,2-dichlorobenzene	1	160	<1	<1	<1	<1	<1	<1
n-butyl benzene	1	NSL	<1	<1	<1	<1	<1	<1
1,2-dibromo-3-chloropropane	1	NSL	<1	<1	<1	<1	<1	<1
1,2,4-trichlorobenzene	1	20	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene	1	NSL	<1	<1	<1	<1	<1	<1
1,2,3-trichlorobenzene	1	3	<1	<1	<1	<1	<1	<1
Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	0.2	50	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1
Acenaphthylene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	0.1	0.6	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	0.1	0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	0.1	1	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	<0.1
Pyrene	0.1	NSL	**0.2**	**0.2**	**0.1**	**0.2**	**0.1**	<0.1
Benzo(a)anthracene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	0.2	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total PAHs	0.1	NSL	**0.38**	**0.36**	**0.3**	**0.38**	**0.32**	<0.1

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

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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)	MW1	MW1 [LAB_DUP]	MW3	MW6	WDUP1	WDUP2
Inorganic Compounds and Parameters								
pH	-	6.5 - 8.5	5.3	NA	5.2	5.6	NA	NA
Electrical Conductivity (µS/cm)	1	NSL	**1300**	NA	**200**	**1400**	NA	NA
Chloride (mg/L)	1	NSL	**130**	NA	**27**	**510**	NA	NA
Sulphate (mg/L)	1	NSL	**340**	NA	**35**	**87**	NA	NA
Metals and Metalloids								
Arsenic (As III)	1	100	<1	[NT]	<1	<1	<1	<1
Cadmium	0.1	20	<0.1	[NT]	<0.1	<0.1	<0.1	<0.1
Chromium (total)	1	500	<1	[NT]	<1	<1	<1	<1
Copper	1	20000	**2**	[NT]	**1**	**1**	**2**	**1**
Lead	1	100	<1	[NT]	<1	<1	<1	<1
Total Mercury (inorganic)	0.05	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel	1	200	**3**	[NT]	<1	**13**	**3**	<1
Zinc	1	30000	**14**	[NT]	**6**	**71**	**14**	**4**
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)								
Benzene	1	10	<1	<1	<1	<1	<1	<1
Toluene	1	8000	<1	<1	<1	<1	<1	<1
Ethylbenzene	1	3000	<1	<1	<1	<1	<1	<1
m+p-xylene	2	NSL	<2	<2	<2	<2	<2	<2
o-xylene	1	NSL	<1	<1	<1	<1	<1	<1
Total xylenes	2	6000	<2	<2	<2	<2	<2	<2
Total Recoverable Hydrocarbons (TRHs)								
TRH F1	10	NSL	<10	<10	<10	<10	<10	<10
TRH F2	50	NSL	<50	<50	<50	<50	<50	<50
TRH F3	100	NSL	<100	<100	<100	<100	<100	<100
TRH F4	100	NSL	<100	<100	<100	<100	<100	<100
Volatile Organic Compounds (VOCs), including chlorinated VOCs								
Dichlorodifluoromethane	10	NSL	<10	<10	<10	<10	<10	<10
Chloromethane	10	NSL	<10	<10	<10	<10	<10	<10
Vinyl Chloride	10	3	<10	<10	<10	<10	<10	<10
Bromomethane	10	NSL	<10	<10	<10	<10	<10	<10
Chloroethane	10	NSL	<10	<10	<10	<10	<10	<10
Trichlorofluoromethane	10	NSL	<10	<10	<10	<10	<10	<10
1,1-Dichloroethene	1	300	<1	<1	<1	<1	<1	<1
Trans-1,2-dichloroethene	1	600	<1	<1	<1	<1	<1	<1
1,1-dichloroethane	1	NSL	<1	<1	<1	<1	<1	<1
Cis-1,2-dichloroethene	1	600	<1	<1	<1	<1	<1	<1
Bromochloromethane	1	2500	<1	<1	<1	<1	<1	<1
Chloroform	1		<1	<1	<1	<1	<1	<1
2,2-dichloropropane	1	NSL	<1	<1	<1	<1	<1	<1
1,2-dichloroethane	1	30	<1	<1	<1	<1	<1	<1
1,1,1-trichloroethane	1	NSL	<1	<1	<1	<1	<1	<1
1,1-dichloropropene	1	NSL	<1	<1	<1	<1	<1	<1
Cyclohexane	1	NSL	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	1	30	<1	<1	<1	<1	<1	<1
Benzene	1	10	<1	<1	<1	<1	<1	<1
Dibromomethane	1	NSL	<1	<1	<1	<1	<1	<1
1,2-dichloropropane	1	NSL	<1	<1	<1	<1	<1	<1
Trichloroethene	1	NSL	<1	<1	<1	<1	<1	<1
Bromodichloromethane	1	NSL	<1	<1	<1	<1	<1	<1
trans-1,3-dichloropropene	1	1000	<1	<1	<1	<1	<1	<1
cis-1,3-dichloropropene	1	1000	<1	<1	<1	<1	<1	<1
1,1,2-trichloroethane	1	NSL	<1	<1	<1	<1	<1	<1
Toluene	1	8000	<1	<1	<1	<1	<1	<1
1,3-dichloropropane	1	NSL	<1	<1	<1	<1	<1	<1
Dibromochloromethane	1	NSL	<1	<1	<1	<1	<1	<1
1,2-dibromoethane	1	NSL	<1	<1	<1	<1	<1	<1
Tetrachloroethene	1	500	<1	<1	<1	<1	<1	<1
1,1,1,2-tetrachloroethane	1	NSL	<1	<1	<1	<1	<1	<1
Chlorobenzene	1	3000	<1	<1	<1	<1	<1	<1
Ethylbenzene	1	3000	<1	<1	<1	<1	<1	<1
Bromoform	1	NSL	<1	<1	<1	<1	<1	<1
m+p-xylene	2	NSL	<2	<2	<2	<2	<2	<2
Styrene	1	300	<1	<1	<1	<1	<1	<1
1,1,2,2-tetrachloroethane	1	NSL	<1	<1	<1	<1	<1	<1
o-xylene	1	NSL	<1	<1	<1	<1	<1	<1
1,2,3-trichloropropane	1	NSL	<1	<1	<1	<1	<1	<1
Isopropylbenzene	1	NSL	<1	<1	<1	<1	<1	<1
Bromobenzene	1	NSL	<1	<1	<1	<1	<1	<1
n-propyl benzene	1	NSL	<1	<1	<1	<1	<1	<1
2-chlorotoluene	1	NSL	<1	<1	<1	<1	<1	<1
4-chlorotoluene	1	NSL	<1	<1	<1	<1	<1	<1
1,3,5-trimethyl benzene	1	NSL	<1	<1	<1	<1	<1	<1
Tert-butyl benzene	1	NSL	<1	<1	<1	<1	<1	<1
1,2,4-trimethyl benzene	1	NSL	<1	<1	<1	<1	<1	<1
1,3-dichlorobenzene	1	200	<1	<1	<1	<1	<1	<1
Sec-butyl benzene	1	NSL	<1	<1	<1	<1	<1	<1
1,4-dichlorobenzene	1	400	<1	<1	<1	<1	<1	<1
4-isopropyl toluene	1	NSL	<1	<1	<1	<1	<1	<1
1,2-dichlorobenzene	1	15000	<1	<1	<1	<1	<1	<1
n-butyl benzene	1	NSL	<1	<1	<1	<1	<1	<1
1,2-dibromo-3-chloropropane	1	NSL	<1	<1	<1	<1	<1	<1
1,2,4-trichlorobenzene	1	300	<1	<1	<1	<1	<1	<1
1,2,3-trichlorobenzene	1		<1	<1	<1	<1	<1	<1
Hexachlorobutadiene	1	7	<1	<1	<1	<1	<1	<1
Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	0.2	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1
Acenaphthylene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	0.1	NSL	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	<0.1
Pyrene	0.1	NSL	**0.2**	**0.2**	**0.1**	**0.2**	**0.1**	<0.1
Benzo(a)anthracene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	0.2	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total PAHs	0.1	NSL	**0.38**	**0.36**	**0.3**	**0.38**	**0.32**	<0.1

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

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TABLE G3
GROUNDWATER LABORATORY RESULTS COMPARED TO HSLs
All data in µg/L unless stated otherwise

				C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	
PQL - Envirolab Services				10	50	1	1	1	2	1	PID
NEPM 2013 - Land Use Category				HSL-A/B: LOW/HIGH DENSITY RESIDENTIAL							
Sample Reference	**Water Depth**	**Depth Category**	**Soil Category**								
MW1	3.27	2m to <4m	Sand	<10	<50	<1	<1	<1	<2	<1	3.5
MW1 - [LAB DUP]	3.27	2m to <4m	Sand	<10	<50	<1	<1	<1	<2	<1	NA
MW3	2.6	2m to <4m	Sand	<10	<50	<1	<1	<1	<2	<1	2.6
MW6	2.76	2m to <4m	Sand	<10	<50	<1	<1	<1	<2	<1	41.5
WDUP1	3.27	2m to <4m	Sand	<10	<50	<1	<1	<1	<2	<1	NA
WDUP2	2.6	2m to <4m	Sand	<10	<50	<1	<1	<1	<2	<1	NA
Total Number of Samples				6	6	6	6	6	6	6	3
Maximum Value				<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	41.5

Concentration above the SAC **VALUE**
Site specific assesment (SSA) required **VALUE**
Concentration above the PQL **Bold**
The guideline corresponding to the elevated value is highlighted in grey in the Groundwater Assessment Criteria Table below

HSL GROUNDWATER ASSESSMENT CRITERIA

Sample Reference	**Water Depth**	**Depth Category**	**Soil Category**	C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene
MW1	3.27	2m to <4m	Sand	1000	1000	800	NL	NL	NL	NL
MW1 - [LAB DUP]	3.27	2m to <4m	Sand	1000	1000	800	NL	NL	NL	NL
MW3	2.6	2m to <4m	Sand	1000	1000	800	NL	NL	NL	NL
MW6	2.76	2m to <4m	Sand	1000	1000	800	NL	NL	NL	NL
WDUP1	3.27	2m to <4m	Sand	1000	1000	800	NL	NL	NL	NL
WDUP2	2.6	2m to <4m	Sand	1000	1000	800	NL	NL	NL	NL

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TABLE G4
SUMMARY OF PFAS CONCENTRATIONS IN GROUNDWATER - ECOLOGY
All results in µg/L unless stated otherwise.

	PQL Envirolab Services	NEMP 2020 Interim 99% Marine	SAMPLES					
			MW1	MW1 [LAB_DUP]	MW3	MW6	WDUP1	WDUP2
PFAS Compound								
Perfluorobutanesulfonic acid	0.1	NSL	**0.0097**	**0.01**	**0.003**	**0.003**	**0.01**	<0.02
Perfluoropentanesulfonic acid	0.1	NSL	**0.004**	**0.004**	**0.001**	<0.001	**0.005**	<0.02
Perfluorohexanesulfonic acid - PFHxS	0.1	NSL	**0.0043**	**0.0041**	**0.0033**	**0.0048**	**0.0031**	<0.01
Perfluoroheptanesulfonic acid	0.1	NSL	<0.001	<0.001	<0.001	<0.001	<0.001	<0.02
Perfluorooctanesulfonic acid PFOS	0.1	0.00023	**0.002**	**0.001**	**0.001**	**0.0047**	**0.001**	<0.01
Perfluorodecanesulfonic acid	0.2	NSL	<0.002	<0.002	<0.002	<0.002	<0.002	<0.02
Perfluorobutanoic acid	0.2	NSL	<0.002	<0.002	<0.002	<0.002	<0.002	<0.1
Perfluoropentanoic acid	0.2	NSL	**0.002**	**0.002**	<0.002	<0.002	**0.002**	<0.02
Perfluorohexanoic acid	0.1	NSL	**0.002**	**0.002**	<0.0004	<0.0004	**0.002**	<0.02
Perfluoroheptanoic acid	0.1	NSL	**0.0006**	<0.0004	<0.0004	<0.0004	**0.0004**	<0.02
Perfluorooctanoic acid PFOA	0.1	19	**0.001**	**0.001**	**0.0006**	**0.002**	**0.0009**	<0.01
Perfluorononanoic acid	0.1	NSL	<0.001	<0.001	<0.001	<0.001	<0.001	<0.02
Perfluorodecanoic acid	0.5	NSL	<0.002	<0.002	<0.002	<0.002	<0.002	<0.02
Perfluoroundecanoic acid	0.5	NSL	<0.002	<0.002	<0.002	<0.002	<0.002	<0.02
Perfluorododecanoic acid	0.5	NSL	<0.005	<0.005	<0.005	<0.005	<0.005	<0.02
Perfluorotridecanoic acid	0.5	NSL	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02
Perfluorotetradecanoic acid	5	NSL	<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	<0.05
6:2 FTS	0.1	NSL	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.05
8:2 FTS	0.1	NSL	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.05
10:2 FTS	0.1	NSL	<0.002	<0.002	<0.002	<0.002	<0.002	<0.05
Perfluorooctane sulfonamide	1	NSL	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02
N-Methyl perfluorooctane sulfonamide	1	NSL	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05
N-Ethyl perfluorooctanesulfon amide	1	NSL	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05
N-Me perfluorooctanesulfonamid oethanol	1	NSL	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05
N-Et perfluorooctanesulfonamid oethanol	5	NSL	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
MePerfluorooctanesulf-amid oacetic acid	0.2	NSL	<0.002	<0.002	<0.002	<0.002	<0.002	<0.02
EtPerfluorooctanesulf-amid oacetic acid	0.2	NSL	<0.002	<0.002	<0.002	<0.002	<0.002	<0.02
Total Positive PFHxS & PFOS	0.1	NSL	**0.006**	**0.0054**	**0.0046**	**0.0095**	**0.0046**	<0.01
Total Positive PFOS & PFOA	0.1	NSL	**0.003**	**0.0025**	**0.002**	**0.0062**	**0.0024**	<0.01
Total Positive PFAS	0.1	NSL	**0.025**	**0.025**	**0.0094**	**0.014**	**0.025**	<0.01

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

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TABLE G5
SUMMARY OF PFAS CONCENTRATIONS IN GROUNDWATER - HUMAN HEALTH
All results in µg/L unless stated otherwise.

	PQL Envirolab Services	NEMP 2020 Recreational	SAMPLES					
			MW1	MW1 [LAB_DUP]	MW3	MW6	WDUP1	WDUP2
PFAS Compound								
Perfluorobutanesulfonic acid	0.1	NSL	**0.0097**	**0.01**	**0.003**	**0.003**	**0.01**	<0.02
Perfluoropentanesulfonic acid	0.1	NSL	**0.004**	**0.004**	**0.001**	<0.001	**0.005**	<0.02
Perfluorohexanesulfonic acid - PFHxS	0.1	NSL	**0.0043**	**0.0041**	**0.0033**	**0.0048**	**0.0031**	<0.01
Perfluoroheptanesulfonic acid	0.1	NSL	<0.001	<0.001	<0.001	<0.001	<0.001	<0.02
Perfluorooctanesulfonic acid PFOS	0.1	NSL	**0.002**	**0.001**	**0.001**	**0.0047**	**0.001**	<0.01
Perfluorodecanesulfonic acid	0.2	NSL	<0.002	<0.002	<0.002	<0.002	<0.002	<0.02
Perfluorobutanoic acid	0.2	NSL	<0.002	<0.002	<0.002	<0.002	<0.002	<0.1
Perfluoropentanoic acid	0.2	NSL	**0.002**	**0.002**	<0.002	<0.002	**0.002**	<0.02
Perfluorohexanoic acid	0.1	NSL	**0.002**	**0.002**	<0.0004	<0.0004	**0.002**	<0.02
Perfluoroheptanoic acid	0.1	NSL	**0.0006**	<0.0004	<0.0004	<0.0004	**0.0004**	<0.02
Perfluorooctanoic acid PFOA	0.1	10	**0.001**	**0.001**	**0.0006**	**0.002**	**0.0009**	<0.01
Perfluorononanoic acid	0.1	NSL	<0.001	<0.001	<0.001	<0.001	<0.001	<0.02
Perfluorodecanoic acid	0.5	NSL	<0.002	<0.002	<0.002	<0.002	<0.002	<0.02
Perfluoroundecanoic acid	0.5	NSL	<0.002	<0.002	<0.002	<0.002	<0.002	<0.02
Perfluorododecanoic acid	0.5	NSL	<0.005	<0.005	<0.005	<0.005	<0.005	<0.02
Perfluorotridecanoic acid	0.5	NSL	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02
Perfluorotetradecanoic acid	5	NSL	<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	<0.05
6:2 FTS	0.1	NSL	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.05
8:2 FTS	0.1	NSL	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.05
10:2 FTS	0.1	NSL	<0.002	<0.002	<0.002	<0.002	<0.002	<0.05
Perfluorooctane sulfonamide	1	NSL	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02
N-Methyl perfluorooctane sulfonamide	1	NSL	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05
N-Ethyl perfluorooctanesulfon amide	1	NSL	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05
N-Me perfluorooctanesulfonamid oethanol	1	NSL	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05
N-Et perfluorooctanesulfonamid oethanol	5	NSL	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
MePerfluorooctanesulf-amid oacetic acid	0.2	NSL	<0.002	<0.002	<0.002	<0.002	<0.002	<0.02
EtPerfluorooctanesulf-amid oacetic acid	0.2	NSL	<0.002	<0.002	<0.002	<0.002	<0.002	<0.02
Total Positive PFHxS & PFOS	0.1	2	**0.006**	**0.0054**	**0.0046**	**0.0095**	**0.0046**	<0.01
Total Positive PFOS & PFOA	0.1	NSL	**0.003**	**0.0025**	**0.002**	**0.0062**	**0.0024**	<0.01
Total Positive PFAS	0.1	NSL	**0.025**	**0.025**	**0.0094**	**0.014**	**0.025**	<0.01

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

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Table G6
SUMMARY OF GROUNDWATER LABORATORY RESULTS

Sample Reference	Field Measurements						Laboratory Results				Classification for Concrete Piles Soil Condition B	Classification for Steel Piles Soil Condition B
	SWL (m)	pH	EC (µS/cm)	Temp (°C)	Eh (mV)	DO (mg/L)	pH	EC (µS/cm)	Sulfate (mg/L)	Chloride (mg/L)		
MW1	3.27	5.2	970	16.4	47.6	1.9	5.3	1,300	340	130	Mildly Aggressive	Non-Aggressive
MW3	2.6	4.7	155	18	23.1	0.8	5.2	200	35	27	Mildly Aggressive	Non-Aggressive
MW6	2.76	5.1	1,578	17.5	103	4.9	5.6	1,400	87	510	Non-Aggressive	Non-Aggressive
Total Number of Samples	3	3	3	3	3	3	3	3	3	3	-	-
Minimum Value	2.6	4.7	155	16.4	23.1	0.8	5.2	200	35	27	-	-
Maximum Value	3.27	5.2	1,578	18	103	4.9	5.6	1,400	340	510	-	-

Exposure Classification for Concrete Piles

Classification is based on Soil condition 'B' - low permeability soils (e.g. silts and clays) or all soils above groundwater.

pH	Sulfate (mg/L)	Chloride (mg/L)	Classification B
> 5.5	<1,000	<6,000	Non-Aggressive
4.5 - 5.5	1,000 - 3,000	6,000 - 12,000	Mildly Aggressive
4.0 - 4.5	3,000 - 10,000	12,000 - 30,000	Moderately Aggressive
< 4	>10,000	>30,000	Severely Aggressive

Exposure Classification for Steel Piles

Classification is also based on Soil condition 'B' - low permeability soils (e.g. silts and clays) or all soils above groundwater.

pH	Chloride (mg/L)	Classification B
> 5	<1,000	Non-Aggressive
4.0 - 5.0	1,000 - 10,000	Non-Aggressive
3.0 - 4.0	10,000 - 20,000	Mildly Aggressive
<3	>20,000	Moderately Aggressive

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TABLE Q1
SOIL QA/QC SUMMARY

| | | | TRH C6 - C10 | TRH >C10-C16 | TRH >C16-C34 | TRH >C34-C40 | Benzene | Toluene | Ethylbenzene | m+p-xylene | o-Xylene | 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 | 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 | Azinphos-methyl (Guthion) | Bromophos-ethyl | Chlorpyriphos | Chlorpyriphos-methyl | Diazinon | Dichlorvos | Dimethoate | Ethion | Fenitrothion | Malathion | Parathion | Ronnel | Total PCBS | Arsenic | Cadmium | Chromium | Copper | Lead | Mercury | Nickel | Zinc | ACM >7mm | AF/FA Asbestos |
|---|---|---

TABLE Q2
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	BH116	0-0.1	<0.1	<0.1	<0.1	<0.1	1.6	<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	1.6	1.8	1.8
laboratory	SDUP6	0-0.1	<0.1	<0.1	<0.1	<0.1	1.9	<0.2	<0.2	<0.2	<0.1	<0.1	0.2	<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	1.9	2.1	2.1
duplicate	MEAN		nc	nc	nc	nc	1.75	nc	nc	nc	nc	nc	0.15	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	1.75	1.95	1.95
	RPD %		nc	nc	nc	nc	17%	nc	nc	nc	nc	nc	67%	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	17%	15%	15%
Inter	BH102	0-0.1	<0.1	<0.1	<0.1	<0.1	5.7	<0.2	<0.2	<0.2	0.1	<0.1	0.3	0.2	<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	5.7	6	6.3
laboratory	SDUP3	0-0.1	<0.1	<0.1	<0.1	<0.1	5.4	<0.2	<0.2	<0.2	0.1	<0.1	0.4	0.2	0.6	<0.5	<0.5	<0.5	<5	<0.1	<0.1	<0.2	<0.2	<1	<1	<1	<1	<5	<0.2	<0.2	5.4	5.8	6.7
duplicate	MEAN		nc	nc	nc	nc	5.55	nc	nc	nc	0.1	nc	0.35	0.2	0.425	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	5.55	5.9	6.5
	RPD %		nc	nc	nc	nc	5%	nc	nc	nc	0%	nc	29%	0%	82%	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	5%	3%	6%
Field	TB	-	<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	13/07/2022																																

Result outside of QA/QC acceptance criteria Value

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TABLE Q3
GROUNDWATER QA/QC SUMMARY

		Dichlorodifluoromethane	Chloromethane	Vinyl Chloride	Bromomethane	Chloroethane	Trichlorofluoromethane	1,1-Dichloroethene	Trans-1,2-dichloroethene	1,1-dichloroethane	Cis-1,2-dichloroethene	Bromochloromethane	Chloroform	2,2-dichloropropane	1,2-dichloroethane	1,1,1-trichloroethane	1,1-dichloropropene	Cyclohexane	Carbon tetrachloride	Benzene	Dibromomethane	1,2-dichloropropane	Trichloroethene	Bromodichloromethane	trans-1,3-dichloropropene	cis-1,3-dichloropropene	1,1,2-trichloroethane	Toluene	1,3-dichloropropane	Dibromochloromethane	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	*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*	*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*	*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*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*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	<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	<1	<1	<1	<1
laboratory	WDUP1	<10	<10	<10	<10	<10	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<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	<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	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	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	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	nc	nc	nc
Inter	MW3	<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	<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	<1	<1	<1	<1
laboratory	WDUP2	<10	<10	<10	<10	<10	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<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	<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	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	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	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	nc	nc	nc
Field	TB-W1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Blank	27/07/2022																																																																														
Field	FR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rinsate	27/07/2022																																																																													

		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	Benz(a)anthracene	Chrysene	Benzo(b,j+k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-c,d)pyrene	Dibenz(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	0.2	0.2	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<1	2	<1	<0.05	3	14
laboratory	WDUP1	<10	<50	<100	<100	<1	<1	<1	<2	<1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<1	2	<1	<0.05	3	14
duplicate	MEAN	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	0.2	0.15	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	2	nc	nc	3	14
	RPD %	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	0%	67%	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	0%	nc	nc	0%	0%
Inter	MW3	<10	<50	<100	<100	<1	<1	<1	<2	<1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<1	1	<1	<0.05	<1	6
laboratory	WDUP2	<10	<50	<100	<100	<1	<1	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<1	1	<1	<0.05	<1	4
duplicate	MEAN	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	0.125	0.075	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	1	nc	nc	nc	5
	RPD %	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	120%	67%	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	0%	nc	nc	nc	40%
Field	TB-W1	38	-	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Blank	27/07/2022																																
Field	FR	70	-	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Rinsate	27/07/2022																																
Trip	TS-W1	-	-	-	-	110%	105%	118%	115%	113%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Spike	27/07/2022																																

Result outside of QA/QC acceptance criteria Value

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TABLE Q4
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		*0.0004*	*0.001*	*0.0002*	*0.001*	*0.0002*	*0.002*	*0.002*	*0.002*	*0.0004*	*0.0004*	*0.0002*	*0.001*	*0.002*	*0.002*	*0.005*	*0.01*	*0.05*	*0.001*	*0.0004*	*0.0004*	*0.002*	*0.01*	*0.005*	*0.01*	*0.005*	*0.05*	*0.002*	*0.002*	*0.0002*	*0.0002*	*0.0002*
PQL ALS Environmental		*0.02*	*0.02*	*0.01*	*0.02*	*0.01*	*0.02*	*0.1*	*0.02*	*0.02*	*0.02*	*0.01*	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.02*	*0.05*	*0.05*	*0.05*	*0.05*	*0.02*	*0.02*	*0.01*	*0.01*	*0.01*
Intra	MW1	0.0097	0.004	0.0043	<0.001	0.002	<0.002	<0.002	0.002	0.002	0.0006	0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.05	<0.002	<0.002	0.006	0.003	0.025
laboratory	WDUP1	0.01	0.005	0.0031	<0.001	0.001	<0.002	<0.002	0.002	0.002	0.0004	0.0009	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.05	<0.002	<0.002	0.0046	0.0024	0.025
duplicate	MEAN	0.0099	0.0045	0.0037	nc	0.0015	nc	nc	0.002	0.002	0.0005	0.001	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	0.0053	0.0027	0.025
	RPD %	3%	22%	32%	nc	67%	nc	nc	0%	0%	40%	11%	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	26%	22%	0%
Inter	MW3	0.003	0.001	0.0033	<0.001	0.001	<0.002	<0.002	<0.002	<0.0004	<0.0004	0.0006	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.05	<0.002	<0.002	0.0046	0.002	0.0094
laboratory	WDUP2	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01
duplicate	MEAN	0.0265	0.0255	0.0267	nc	0.0255	nc	nc	nc	nc	nc	0.0253	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	0.0273	0.026	0.0297
	RPD %	177%	192%	175%	nc	192%	nc	nc	nc	nc	nc	195%	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	166%	185%	137%

Result outside of QA/QC acceptance criteria Value

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Appendix D: Borehole Logs

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BOREHOLE LOG

Borehole No. 1

Client: SCHOOL INFRASTRUCTURE NSW

Project: PROPOSED SCHOOL UPGRADE

Location: PARRAMATTA EAST PUBLIC SCHOOL, PARRAMATTA, NSW

Job No.: E35073LT **Method:** SPIRAL AUGER **R.L. Surface:** ~21.2 m

Date: 12/7/22 **Datum:** AHD

Plant Type: JK309 **Logged/Checked By:** T.F./A.B.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION						21			CH	FILL: Sandy gravel, fine to coarse grained igneous, grey, fine to coarse grained sand, with concrete fragments.	M w<PL	Hd		SCREEN: 9.35kg 0-0.1m NO FCF
					N = 12 3,6,6		1			Silty CLAY: plasticity, orange brown, trace of fine to medium grained ironstone gravel, and root fibres.			500 520 430	RESIDUAL
						20			CI	Silty CLAY: medium plasticity, light grey mottled red brown, trace of fine grained sand.				
					N > 11 9,11/ 150mm REFUSAL		2		-	Extremely Weathered sandstone: silty CLAY, low plasticity, light grey, trace of fine grained sand, with occasional ironstone bands.	XW	Hd	550 >600 >600	HAWKESBURY SANDSTONE
						19				SANDSTONE: fine to medium grained, grey and red brown.	DW	L		LOW RESISTANCE
						18	3			as above, but light grey and red brown, with extremely weathered bands and ironstone bands.		VL		VERY LOW TO LOW RESISTANCE WITH OCCASIONAL MODERATE STRENGTH BANDS
ON 15/7/22						17	4		-	LAMINITE: SANDSTONE: fine to medium grained, brown, interbedded with SILTSTONE: dark grey.		L - M		MODERATE RESISTANCE
						16	5		-	SANDSTONE: fine to medium grained, grey.		M - H		MODERATE TO HIGH RESISTANCE
												H		HIGH RESISTANCE
						15	6			END OF BOREHOLE AT 5.60 m				'TC' BIT REFUSAL GROUNDWATER MONITORING WELL INSTALLED TO 5.5m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 5.5m TO 2.5m. CASING 2.5m TO 0m. 2mm SAND FILTER PACK 5.5m TO 2.3m. BENTONITE SEAL 2.3m TO 0.8m.

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BOREHOLE LOG

Borehole No. 1 **2 / 2**

Client: SCHOOL INFRASTRUCTURE NSW

Project: PROPOSED SCHOOL UPGRADE

Location: PARRAMATTA EAST PUBLIC SCHOOL, PARRAMATTA, NSW

Job No.: E35073LT **Method:** SPIRAL AUGER **R.L. Surface:** ~21.2 m

Date: 12/7/22 **Datum:** AHD

Plant Type: JK309 **Logged/Checked By:** T.F./A.B.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
						14								BACKFILLED WITH SAND AND CUTTINGS TO THE SURFACE. COMPLETED WITH A CONCRETED GATIC COVER.
							8							
						13								
							9							
						12								
							10							
						11								
							11							
						10								
							12							
						9								
							13							
						8								

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BOREHOLE LOG

Borehole No. 2

Client: SCHOOL INFRASTRUCTURE NSW

Project: PROPOSED SCHOOL UPGRADE

Location: PARRAMATTA EAST PUBLIC SCHOOL, PARRAMATTA, NSW

Job No.: E35073LT **Method:** SPIRAL AUGER **R.L. Surface:** ~24.2 m

Date: 12/7/22 **Datum:** AHD

Plant Type: JK309 **Logged/Checked By:** T.F./A.B.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
						24			-	ASPHALTIC CONCRETE: 40mm.t	M			INSUFFICIENT RETURN FOR BULK SCREEN
										FILL: Mixture of Sand and Gravel, fine to coarse grained sand, and fine to coarse grained igneous gravel.				
					N = 13 5,6,7				CH	FILL: Gravelly sand, fine to medium grained, brown and grey, fine to medium grained igneous gravel.	w~PL	Hd		SCREEN: 13.28kg 0.1-0.4m NO FCF
											w<PL		>600 400 460	RESIDUAL
						23	1			Silty CLAY: high plasticity, orange brown, trace of fine to medium grained ironstone gravel.				
										as above, but light grey and red brown.				
					N = 26 7,12,14				-	Extremely Weathered sandstone: silty CLAY, low plasticity, light grey, trace of fine grained sand.	XW	Hd	580 >600 >600	HAWKESBURY SANDSTONE VERY LOW 'TC' BIT RESISTANCE
ON COMPLETION OF CORING						22	2							
					N = 26 7,9,17	21	3			Extremely Weathered sandstone: silty CLAY, low plasticity, light grey, with fine to medium grained sand, interbedded with extremely weathered siltstone and occasional ironstone bands.			>600 >600 >600	
							4			REFER TO CORED BOREHOLE LOG				
						20								
							5							
						19								
							6							
						18								

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CORED BOREHOLE LOG

Borehole No. 2

Client: SCHOOL INFRASTRUCTURE NSW

Project: PROPOSED SCHOOL UPGRADE

Location: PARRAMATTA EAST PUBLIC SCHOOL, PARRAMATTA, NSW

Job No.: E35073LT | **Core Size:** NMLC | **R.L. Surface:** ~24.2 m

Date: 12/7/22 | **Inclination:** VERTICAL | **Datum:** AHD

Plant Type: JK309 | **Bearing:** N/A | **Logged/Checked By:** T.F./A.B.

Water Loss\Level	Barrel Lift	RL (m AHD)	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: SPACING (mm)	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
ON COMPLETION OF CORING		21									
			4		START CORING AT 4.00m						
100% RETURN		20			SANDSTONE: fine to medium grained, light grey and orange brown, sub-horizontally bedded.	HW	M - H	1.2		(4.04m) CS, 0°, 40 mm.t (4.24m) CS, 0°, 50 mm.t	
					NO CORE 0.15m					(4.49m) CS, 0°, 80 mm.t	
					SANDSTONE: fine to medium grained, light grey and red brown, sub-horizontally bedded.	HW	M			(4.70m) XWS, 40 mm.t (4.81m) CS, 0°, 80 mm.t	Hawkesbury Sandstone
							VL			(4.92m) Be, 0°, P, R, Fe Sn	
			5		SILTSTONE: grey, bedded sub-horizontally.	MW	M	1.0 1.2			
		19			SANDSTONE: fine to medium grained, light grey and orange brown, bedded sub-horizontally.	HW	VL			(5.15m) Be, 0°, P, R, Clay Vn (5.20m) CS, 0°, 30 mm.t	
					LAMINITE: SILTSTONE: grey, interbedded with SANDSTONE: fine to medium grained, light grey and orange brown, with medium strength bands, bedded sub-horizontally.					(5.48m) XWS, 60 mm.t	
			6			MW	M	0.80			
		18			SANDSTONE: fine to medium grained, light grey and orange brown, bedded sub-horizontally.		L			(6.17m) CS, 10 mm.t (6.29m) CS, 20 mm.t	
					SILTSTONE: dark grey, with fine grained, grey sandstone laminae.	SW	M	1.0		(6.59m) Be, 0°, P, R, Clay Vn	
					SANDSTONE: fine to medium grained, light grey and orange brown, bedded sub-horizontally.					(6.79m) Be, 5°, P, R, Clay Vn	
100% RETURN			7					0.60			
		17			as above, but medium grained and bedded at 5-10°.		H	1.4			
			8					1.9		(7.74m) Be, 10°, P, R, Fe Sn (7.92m) Be, 5°, R, Clay Vn	
					END OF BOREHOLE AT 8.00 m						
		16									
			9								
		15									

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FRACTURES NOT MARKED ARE CONSIDERED TO BE DRILLING AND HANDLING BREAKS

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BOREHOLE LOG

Borehole No. 3

Client: SCHOOL INFRASTRUCTURE NSW

Project: PROPOSED SCHOOL UPGRADE

Location: PARRAMATTA EAST PUBLIC SCHOOL, PARRAMATTA, NSW

Job No.: E35073LT **Method:** SPIRAL AUGER **R.L. Surface:** ~24.4 m

Date: 12/7/22 **Datum:** AHD

Plant Type: JK309 **Logged/Checked By:** T.F./A.B.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
									-	ASPHALTIC CONCRETE: 40mm.t				
									CH	FILL: Sandy gravel, fine to medium grained, grey.	w>PL	Hd		SCREEN: 8.06kg 0.04-0.1m NO FCF
						24				Silty CLAY: high plasticity, orange brown, trace of fine to medium grained ironstone gravel.				RESIDUAL
					N = 8 4,4,4		1						440 420 410	
						23				as above, but light grey and red brown.	w~PL			
					N > 25 7,12,13/ 120mm REFUSAL								>600 >600 >600	
							2		-	Extremely Weathered sandstone: silty CLAY, low plasticity, light grey, trace of fine grained sand, and occasional ironstone bands.	XW	Hd		HAWKESBURY SANDSTONE
						22				SANDSTONE: fine to medium grained, light grey.	DW			VERY LOW 'TC' BIT RESISTANCE WITH BANDS OF LOW TO MODERATE RESISTANCE
ON COMPLETION							3							
						21								MODERATE TO HIGH RESISTANCE WITH BANDS OF VERY LOW TO LOW RESISTANCE
							4							
						20			-	LAMINITE: SANDSTONE: fine to medium grained, grey, interbedded with SILTSTONE: grey .		L		LOW TO MODERATE RESISTANCE
							5		-	SANDSTONE: fine to medium grained, light grey.		M		MODERATE RESISTANCE
						19								
							6					H		HIGH RESISTANCE
						18								
										END OF BOREHOLE AT 6.50 m				'TC' BIT REFUSAL
														GROUNDWATER MONITORING WELL

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BOREHOLE LOG

Borehole No. 3 **2 / 2**

Client: SCHOOL INFRASTRUCTURE NSW

Project: PROPOSED SCHOOL UPGRADE

Location: PARRAMATTA EAST PUBLIC SCHOOL, PARRAMATTA, NSW

Job No.: E35073LT **Method:** SPIRAL AUGER **R.L. Surface:** ~24.4 m

Date: 12/7/22 **Datum:** AHD

Plant Type: JK309 **Logged/Checked By:** T.F./A.B.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
						17	8							INSTALLED TO 6.1m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 6.1m TO 3.1m. CASING 3.0m TO 0.1m. 2mm SAND FILTER PACK 6.1m TO 2.8m. BENTONITE SEAL 2.8m TO 1.8m. BACKFILLED WITH SAND AND CUTTINGS TO THE SURFACE. COMPLETED WITH A CONCRETED GATIC COVER.
						16	9							
						15	10							
						14	11							
						13	12							
						12	13							
						11								

JK 9.02.4 LIB.GLB Log JK AUGERHOLE - MASTER E35073LT PARRAMATTA.GPJ <<DrawingFile>> 22/08/2022 14:44 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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BOREHOLE LOG

Borehole No. 4

Client: SCHOOL INFRASTRUCTURE NSW

Project: PROPOSED SCHOOL UPGRADE

Location: PARRAMATTA EAST PUBLIC SCHOOL, PARRAMATTA, NSW

Job No.: E35073LT **Method:** SPIRAL AUGER **R.L. Surface:** ~23.8 m

Date: 12/7/22 **Datum:** AHD

Plant Type: JK309 **Logged/Checked By:** T.F./A.B.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION									-	ASPHALTIC CONCRETE: 40mm.t FILL: Gravelly sand, fine to medium grained, grey brown, fine to coarse grained igneous gravel.	D			SCREEN: 5.8kg 0.04-0.5m NO FCF
					N = 11 4,5,6	23	1		CH	Silty CLAY: high plasticity, orange brown and red brown, trace of fine to medium grained ironstone gravel.	w<PL	Hd	>600 470 540	RESIDUAL
									CI	Silty CLAY: medium plasticity, red brown and light grey.				
					N > 16 10,10,6/ 20mm REFUSAL	22	2		-	Extremely Weathered sandstone: silty CLAY, low plasticity, light grey and red brown, trace of fine grained sand, with occasional ironstone gravel bands.	XW	Hd	>600 >600 >600	HAWKESBURY SANDSTONE VERY LOW 'TC' BIT RESISTANCE WITH BANDS OF LOW TO MODERATE RESISTANCE
						21	3			SANDSTONE: fine to medium grained, light grey.	DW	L - M		LOW TO MODERATE 'TC' BIT RESISTANCE
												VL - L		
						20	4					L - M		MODERATE TO HIGH RESISTANCE WITH BANDS TO VERY LOW TO LOW RESISTANCE
						19	5			LAMINITE: SILTSTONE: light grey, interbedded with SANDSTONE: fine grained, grey and brown.	DW	L - M		MODERATE RESISTANCE
						18	6			SANDSTONE: fine to medium grained, light grey.	DW	M		MODERATE TO HIGH RESISTANCE
												H		HIGH RESISTANCE
						17				END OF BOREHOLE AT 6.50 m				'TC' BIT REFUSAL

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BOREHOLE LOG

Borehole No. 5

Client: SCHOOL INFRASTRUCTURE NSW

Project: PROPOSED SCHOOL UPGRADE

Location: PARRAMATTA EAST PUBLIC SCHOOL, PARRAMATTA, NSW

Job No.: E35073LT **Method:** SPIRAL AUGER **R.L. Surface:** ~22.4 m

Date: 13/7/22 **Datum:** AHD

Plant Type: JK309 **Logged/Checked By:** T.F./A.B.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
									-	ASPHALTIC CONCRETE: 40mm.t				SCREEN: 6.78kg 0.04-0.3m NO FCF
										FILL: Gravelly sand, fine to coarse grained, grey brown, fine to medium grained igneous gravel.				
						22			CI-CH		w<PL	Hd		RESIDUAL
					N = 16 4,5,11					Silty CLAY: medium to high plasticity, orange brown, trace of fine to medium grained ironstone gravel.			570 540 >600	
							1			as above, with with ironstone band.				
						21				as above, but light grey and red brown.				
					N > 6 7,6/ 50mm REFUSAL				-	Extremely Weathered sandstone: silty CLAY, low plasticity, light grey and red brown, trace of fine grained sand and occasional bands of ironstone.	XW	Hd	>600 >600 >600	HAWKESBURY SANDSTONE BANDED VERY LOW TO LOW 'TC' BIT RESISTANCE
▽ ON COMPLETION OF CORING						20	2							
							3		-	LAMINITE: SANDSTONE: fine grained, light grey and red brown, interbedded with SILTSTONE: dark grey.	DW	VL - L		
						19								LOW TO MODERATE RESISTANCE
										REFER TO CORED BOREHOLE LOG				
							4							
						18								
							5							
						17								
							6							
						16								

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CORED BOREHOLE LOG

Borehole No. 5

Client: SCHOOL INFRASTRUCTURE NSW

Project: PROPOSED SCHOOL UPGRADE

Location: PARRAMATTA EAST PUBLIC SCHOOL, PARRAMATTA, NSW

Job No.: E35073LT | **Core Size:** NMLC | **R.L. Surface:** ~22.4 m

Date: 13/7/22 | **Inclination:** VERTICAL | **Datum:** AHD

Plant Type: JK309 | **Bearing:** N/A | **Logged/Checked By:** T.F./A.B.

Water Loss\Level	Barrel Lift	RL (m AHD)	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: SPACING (mm)	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
		19			START CORING AT 3.50m						
100% RETURN			4		SANDSTONE: fine to medium grained, red brown and light grey, bedded at 5-15°.	MW	L - M	1.1		(3.54m) CS, 30 mm.t (3.57m) XWS, 10 mm.t (3.58m) CS, 70 mm.t (3.65m) XWS, 20 mm.t (3.67m) CS, 30 mm.t (3.80m) Be, 15°, P, R, Fe Sn (4.00m) XWS, 50 mm.t	Hawkesbury Sandstone
					LAMINITE: SILTSTONE: dark grey, interbedded with SANDSTONE: fine grained, grey and orange brown, bedded at 0-5°.	HW	VL - L	0.20			
		18				MW	M			(4.29m) CS, 10 mm.t (4.30m) XWS, 30 mm.t (4.33m) CS, 30 mm.t (4.41m) CS, 20 mm.t (4.56m) Be, 2°, P, R, Fe Sn (4.60m) CS, 20 mm.t (4.69m) Be, 0°, P, R, Fe Sn (4.72m) CS, 10 mm.t (4.78m) Be, P, R, Fe Sn (4.81m) Be, P, R, Fe Sn (4.84m) XWS, 30 mm.t (4.92m) Be, 0°, P, R, Fe Sn (5.10m) Be, 0°, P, R, Fe Sn	
					SANDSTONE: fine to medium grained, light grey and red brown, bedded at 0-5°.			0.50			
			5					2.1			
		17			as above, but light grey, with occasional grey laminae.	SW	M - H	1.0		(5.68m) Be, 5°, P, R, Fe Sn	
			6					0.90		(6.07m) CS, 5 mm.t (6.26m) Be, 0°, P, R, Fe Sn	
100% RETURN		16						2.3			
			7			FR	H	1.3		(7.15m) CS, 2 mm.t	
		15						1.9			
			8		END OF BOREHOLE AT 8.00 m						
		14									
			9								
		13									

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BOREHOLE LOG

Borehole No. 6

1 / 1

Client: SCHOOL INFRASTRUCTURE NSW

Project: PROPOSED SCHOOL UPGRADE

Location: PARRAMATTA EAST PUBLIC SCHOOL, PARRAMATTA, NSW

Job No.: E35073LT **Method:** SPIRAL AUGER **R.L. Surface:** ~20.9 m

Date: 15/7/22 **Datum:** AHD

Plant Type: JK205 **Logged/Checked By:** T.F./A.B.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION										FILL: Silty sand, fine to medium grained, grey brown, fine to coarse grained igneous gravel, and root fibres.	M			GRASS COVER SCREEN: 10.30kg 0-0.4m NO FCF
					N = 12 4,5,7	20	1		CI-CH	Silty CLAY: medium to high plasticity, orange brown, trace of fine to coarse grained ironstone gravel.	w<PL	Hd	450 470 410	RESIDUAL
					N > 16 8,12,4/ 10mm REFUSAL	19	2		-	Extremely Weathered sandstone: silty CLAY, low plasticity, light grey, trace of fine to medium grained sand, with fine to medium grained sandstone bands and occasional ironstone gravel bands.	XW	Hd	>600 >600 >600	HAWKESBURY SANDSTONE LOW TO MODERATE 'TC' BIT RESISTANCE
						18	3			SANDSTONE: fine to medium grained, light grey and red brown.	DW	L - M		MODERATE TO HIGH RESISTANCE
										as above, but with interbedded siltstone, grey and dark grey.		M		BANDS OF LOW RESISTANCE
										SANDSTONE: fine to medium grained, light grey and grey.		H		MODERATE TO HIGH RESISTANCE HIGH RESISTANCE
						17	4			END OF BOREHOLE AT 3.80 m				'TC' BIT REFUSAL GROUNDWATER MONITORING WELL INSTALLED TO 3.7m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 3.7m TO 2.2m. CASING 2.3m TO 0m. 2mm SAND FILTER PACK 3.7m TO 2.2m. BENTONITE SEAL 2.2m TO 1.1m. BACKFILLED WITH SAND AND CUTTINGS TO THE SURFACE. COMPLETED WITH A CONCRETED GATIC COVER.
						16	5							
						15	6							
						14								

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BOREHOLE LOG

Borehole No. 7

1 / 1

Client: SCHOOL INFRASTRUCTURE NSW

Project: PROPOSED SCHOOL UPGRADE

Location: PARRAMATTA EAST PUBLIC SCHOOL, PARRAMATTA, NSW

Job No.: E35073LT **Method:** SPIRAL AUGER **R.L. Surface:** ~21.7 m

Date: 15/7/22 **Datum:** AHD

Plant Type: JK205 **Logged/Checked By:** T.F./A.B.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION										FILL: Silty clay, low plasticity, brown and grey, trace of fine grained sand, fine to medium grained igneous gravel, and root fibres.	w>PL			APPEARS POORLY COMPACTED SCREEN: 11.58kg 0-0.1m NO FCF
					N = 2 1,0,2	21								
							1		CH	Silty CLAY: high plasticity, orange brown, trace of fine to medium grained ironstone gravel.	w<PL	St - VSt	270 180 310	SCREEN: 4.2kg 0.1-0.75m NO FCF RESIDUAL
										as above, but light grey and red brown.		Hd	>600 570 610	
					N = 20 4,8,12	20	2							
									-	Extremely Weathered sandstone: silty CLAY, low to medium plasticity, light grey and red brown, trace of fine grained sand, with occasional ironstone bands.	XW	Hd		HAWKESBURY SANDSTONE VERY LOW TO LOW 'TC' BIT RESISTANCE
					N=SPT 12/ 150mm REFUSAL	19	3						>600 >600 >600	
										SANDSTONE: fine to medium grained, grey and red brown.	DW	M - H		HIGH RESISTANCE
						18				END OF BOREHOLE AT 3.60 m				'TC' BIT REFUSAL
							4							
						17	5							
						16	6							
						15								

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BOREHOLE LOG

Borehole No. 8 **1 / 1**

Client: SCHOOL INFRASTRUCTURE NSW

Project: PROPOSED SCHOOL UPGRADE

Location: PARRAMATTA EAST PUBLIC SCHOOL, PARRAMATTA, NSW

Job No.: E35073LT **Method:** SPIRAL AUGER **R.L. Surface:** ~22.9 m

Date: 15/7/22 **Datum:** AHD

Plant Type: JK205 **Logged/Checked By:** T.F./A.B.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION										FILL: Silty clay, low plasticity, grey brown, trace of fine grained sand, fine to medium grained igneous gravel, and root fibres.	w>PL			GRASS COVER SCREEN: 10.95kg 0-0.45m
					N = 8 4,4,4	22	1		CH	Silty CLAY: high plasticity, orange brown, trace of fine to medium grained ironstone gravel.	w>PL	St	150 110 120	NO FCF RESIDUAL
											w<PL	Hd	540 520	
					N = 20 5,9,11	21	2			as above, but light grey and red brown.			>600 >600 >600	
									-	Extremely Weathered sandstone: silty CLAY, low plasticity, red brown and light grey, with fine to coarse grained ironstone gravel bands.	XW	Hd		HAWKESBURY SANDSTONE VERY LOW 'TC' BIT RESISTANCE
						20	3			SANDSTONE: fine to medium grained, light grey and red brown.	DW	L - M		HIGH RESISTANCE
												H		
						19	4			END OF BOREHOLE AT 3.70 m				'TC' BIT REFUSAL
						18	5							
						17	6							
						16								

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BOREHOLE LOG

Borehole No. 101 1/1

Client: SCHOOL INFRASTUCTURE NSW

Project: PROPOSED SCHOOL UPGRADE

Location: PARRAMATTA EAST PUBLIC SCHOOL, PARRAMATTA, NSW

Job No.: E35073B **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 13/7/22 **Datum:** -

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

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION	■		■			0			FILL: Silty clay, low to medium plasticity, brown, trace of ironstone gravel, and root fibres.	w>PL			GRASS COVER SCREEN: 7.3kg 0-0.1m NO FCF
						0.5		CI-CH	Silty CLAY: medium to high plasticity, yellow brown mottled orange brown, trace of ironstone gravel, and root fibres.	w≈PL			SCREEN: 2.2kg 0.1-0.3m NO FCF RESIDUAL
									END OF BOREHOLE AT 0.7m				
						1							
						1.5							
						2							
						2.5							
						3							
						3.5							

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BOREHOLE LOG

Borehole No. **102** 1/1

SDUP3:ASB:PFAS: 0-0.1m

Client: SCHOOL INFRASTUCTURE NSW

Project: PROPOSED SCHOOL UPGRADE

Location: PARRAMATTA EAST PUBLIC SCHOOL, PARRAMATTA, NSW

Job No.: E35073B **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 13/7/22 **Datum:** -

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

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION	■		■			0			FILL: Sandy clay, low plasticity, brown, fine grained sand, trace of ironstone gravel, and root fibres.	w>PL			GRASS COVER SCREEN: 10.05kg 0-0.1m NO FCF
						0.5		CI=CH	Silty CLAY: medium to high plasticity, yellow brown mottled orange brown, trace of ironstone gravel.	w<PL			SCREEN: 3.35kg 0.1-0.3m NO FCF RESIDUAL
									END OF BOREHOLE AT 0.7m				HAND AUGER REFUSAL
						1							
						1.5							
						2							
						2.5							
						3							
						3.5							

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BOREHOLE LOG

Borehole No. 103
1/1

Client: SCHOOL INFRASTUCTURE NSW

Project: PROPOSED SCHOOL UPGRADE

Location: PARRAMATTA EAST PUBLIC SCHOOL, PARRAMATTA, NSW

Job No.: E35073B **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 13/7/22 **Datum:** -

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

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
ON COMPLETION ▽						0			FILL: Sandy clay, low plasticity, brown, fine grained sand, trace of ironstone gravel, and root fibres.	w>PL			GRASS COVER SCREEN: 9.2kg 0-0.3m NO FCF
SEEPAGE DURING DRILLING						0.5		CI-CH	Silty CLAY: medium to high plasticity, yellow brown mottled orange brown, trace of ironstone gravel.	w≈PL			RESIDUAL
									END OF BOREHOLE AT 0.6m				HAND AUGER REFUSAL DUE TO BOREHOLE COLLAPSE
						1							
						1.5							
						2							
						2.5							
						3							
						3.5							

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BOREHOLE LOG

Borehole No. 104 1/1

Client: SCHOOL INFRASTUCTURE NSW

Project: PROPOSED SCHOOL UPGRADE

Location: PARRAMATTA EAST PUBLIC SCHOOL, PARRAMATTA, NSW

Job No.: E35073B **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 13/7/22 **Datum:** -

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

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION	■		■			0			FILL: Sandy clay, low plasticity. brown, fine grained sand.	w>PL			GRASS COVER SCREEN: 10kg 0-0.1m NO FCF
						0.5		CI-CH	Silty CLAY: medium to high plasticity, yellow brown mottled orange brown, trace of ironstone gravel.	w≈PL			INSUFFICIENT RETURN FOR BULK SCREEN RESIDUAL
									END OF BOREHOLE AT 0.7m				
						1							
						1.5							
						2							
						2.5							
						3							
						3.5							

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BOREHOLE LOG

Borehole No. 105 1/1

Client: SCHOOL INFRASTUCTURE NSW

Project: PROPOSED SCHOOL UPGRADE

Location: PARRAMATTA EAST PUBLIC SCHOOL, PARRAMATTA, NSW

Job No.: E35073B **Method:** PUSH TUBE **R.L. Surface:** N/A

Date: 15/7/22 **Datum:** -

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

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION	■		■			0		-	ASPHALTIC CONCRETE: 20mm.t	D			INSUFFICIENT RETURN FOR BULK SCREEN
								CL-CI	FILL: Sandy gravel, fine to medium grained, dark grey, sub-angular, igneous, fine to medium grained sand.	w>PL			
	■		■			0.5			Sandy CLAY: low to medium plasticity, yellow brown mottled orange brown, fine grained sand, trace of ironstone gravel.				RESIDUAL
	■		■			1		CI-CH	Silty CLAY: medium to high plasticity, yellow brown and grey, trace of ironstone gravel.	w≈PL			
						1.5			END OF BOREHOLE AT 1.5m				
						2							
						2.5							
						3							
						3.5							

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BOREHOLE LOG

Borehole No. 106 1/1

Client: SCHOOL INFRASTUCTURE NSW

Project: PROPOSED SCHOOL UPGRADE

Location: PARRAMATTA EAST PUBLIC SCHOOL, PARRAMATTA, NSW

Job No.: E35073B **Method:** PUSH TUBE **R.L. Surface:** N/A

Date: 15/7/22 **Datum:** -

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

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION	■		■			0		-	ASPHALTIC CONCRETE: 20mm.t	D			SCREEN: 1.45kg 0.02-0.1m NO FCF
								CI-CH	FILL: Sandy gravel, fine to medium grained, grey, sub-angular, igneous, fine to medium grained sand.	w≈PL			
									Silty CLAY: medium to high plasticity, yellow brown mottled orange brown, trace of sand and ironstone gravel.				RESIDUAL
						0.5							
						1		CH	Silty CLAY: high plasticity, grey mottled orange brown.				
									END OF BOREHOLE AT 1.3m				
						1.5							
						2							
						2.5							
						3							
						3.5							

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BOREHOLE LOG

Borehole No. 107 1/1

SDUP9: PFAS: ASB: 0-0.1m

Client: SCHOOL INFRASTUCTURE NSW

Project: PROPOSED SCHOOL UPGRADE

Location: PARRAMATTA EAST PUBLIC SCHOOL, PARRAMATTA, NSW

Job No.: E35073B **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 15/7/22 **Datum:** -

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

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION	■		■			0			FILL: Sandy clay, low plasticity, brown, fine to medium grained sand, trace of igneous gravel and slag.	w>PL			SCREEN: 10.7kg 0-0.1m NO FCF
	■		■					CI-CH	Silty CLAY: medium to high plasticity, yellow brown, trace of ironstone gravel.	w≈PL			SCREEN: 3.9kg 0.1-0.3m NO FCF
						0.5			END OF BOREHOLE AT 0.45m				RESIDUAL HAND AUGER REFUSAL
						1							
						1.5							
						2							
						2.5							
						3							
						3.5							

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BOREHOLE LOG

Borehole No. 108 1/1

SDUP4: ASB: 0-0.1m

Client: SCHOOL INFRASTUCTURE NSW

Project: PROPOSED SCHOOL UPGRADE

Location: PARRAMATTA EAST PUBLIC SCHOOL, PARRAMATTA, NSW

Job No.: E35073B **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 13/7/22 **Datum:** -

Plant Type: JK308 **Logged/Checked by:** H.W./T.H.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION						0			FILL: Silty sandy clay, low plasticity, brown, fine grained sand, trace of ironstone gravel, ceramic tile fragments and root fibres.	w>PL			GRASS COVER SCREEN: 10.05kg 0-0.1m NO FCF
								CI-CH	Silty CLAY: medium to high plasticity, yellow brown mottled orange brown, trace of ironstone gravel, and root fibres.	w<PL			SCREEN: 4.32kg 0.1-0.3m NO FCF RESIDUAL
					N = 11 4,4,7	0.5							
						1							
					N > 13 4,11/0mm	1.5			as above, but grey.				
					REFUSAL			-	Extremely Weathered sandstone: silty SAND, fine to medium grained, grey. END OF BOREHOLE AT 1.65m	XW			HAWKESBURY SANDSTONE
						2							
						2.5							
						3							
						3.5							

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BOREHOLE LOG

Borehole No. 109 1/1

Client: SCHOOL INFRASTUCTURE NSW

Project: PROPOSED SCHOOL UPGRADE

Location: PARRAMATTA EAST PUBLIC SCHOOL, PARRAMATTA, NSW

Job No.: E35073B **Method:** PUSH TUBE **R.L. Surface:** N/A

Date: 15/7/22 **Datum:** -

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

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION						0			ASPHALTIC CONCRETE: 15mm.t	D			INSUFFICIENT RETURN FOR BULK SCREEN
									FILL: Sandy gravel, fine to medium grained, dark grey, sub-angular, igneous gravel, fine to medium grained sand.	M			SCREEN: 3.4kg 0.1-0.3m
								CI-CH	FILL: Clayey sand, fine to medium grained, yellow brown, trace of igneous gravel.	w≈PL			NO FCF
						0.5			Silty CLAY: medium to high plasticity, yellow brown mottled orange brown, trace of ironstone gravel.				RESIDUAL
						1			END OF BOREHOLE AT 1.1m				
						1.5							
						2							
						2.5							
						3							
						3.5							

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BOREHOLE LOG

Borehole No. 110
1/1

Client: SCHOOL INFRASTUCTURE NSW

Project: PROPOSED SCHOOL UPGRADE

Location: PARRAMATTA EAST PUBLIC SCHOOL, PARRAMATTA, NSW

Job No.: E35073B **Method:** PUSH TUBE **R.L. Surface:** N/A

Date: 15/7/22 **Datum:** -

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

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION						0		-	ASPHALTIC CONCRETE: 40mm.t	D			INSUFFICIENT RETURN FOR BULK SCREEN
									FILL: Sandy gravel, fine to medium grained, grey, sub-angular, igneous grave, fine to medium grained sand.	w>PL			SCREEN; 3.45kg 0.1-0.3m
									FILL: Silty clay, low to medium plasticity, brown, trace of sand, igneous gravel and ash.				NO FCF
						0.5		CI-CH	Silty CLAY: medium to high plasticity, yellow brown mottled orange brown, trace of ironstone gravel.	w≈PL			RESIDUAL
						1			END OF BOREHOLE AT 1.0m				
						1.5							
						2							
						2.5							
						3							
						3.5							

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BOREHOLE LOG

Borehole No. **111** 1/1

Client: SCHOOL INFRASTUCTURE NSW

Project: PROPOSED SCHOOL UPGRADE

Location: PARRAMATTA EAST PUBLIC SCHOOL, PARRAMATTA, NSW

Job No.: E35073B **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 13/7/22 **Datum:** -

Plant Type: - **Logged/Checked by:** N.F./T.H.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION	■		■			0			FILL: Silty clay, medium to high plasticity, brown, trace of ironstone and siltstone gravel, ceramic and glass fragments, ash and root fibres.	w≈PL			GRASS COVER SCREEN: 11.67kg 0-0.1m NO FCF
	■		■			0.5		CI-CH	Silty CLAY: medium to high plasticity, yellow brown, trace of ironstone gravel.	w<PL			SCREEN: 4.89kg 0.1-0.3m NO FCF RESIDUAL
									END OF BOREHOLE AT 0.6m				
						1							
						1.5							
						2							
						2.5							
						3							
						3.5							

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BOREHOLE LOG

Borehole No. 112 1/1

SDUP2: 0-0.1m

Client: SCHOOL INFRASTUCTURE NSW

Project: PROPOSED SCHOOL UPGRADE

Location: PARRAMATTA EAST PUBLIC SCHOOL, PARRAMATTA, NSW

Job No.: E35073B **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 12/7/22 **Datum:** -

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

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION	■		■			0			FILL: Clayey sand, fine to medium grained, brown, trace of igneous grave, plastic and ceramic fragments, and ash.	M			GRAVEL COVER
										w≈PL			SCREEN: 12kg 0-0.1m NO FCF
									FILL: Silty clay, low plasticity, brown, trace of sand and igneous gravel.				SCREEN: 3.75kg 0.1-0.4m NO FCF
	■		■			0.5		CI-CH	Silty CLAY: medium to high plasticity, yellow brown, trace of ironstone gravel.	w≈PL			RESIDUAL
									END OF BOREHOLE AT 0.6m				HAND AUGER REFUSAL
						1							
						1.5							
						2							
						2.5							
						3							
						3.5							

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BOREHOLE LOG

Borehole No. **113** 1/1

SDUP8: 0-0.1m

Client: SCHOOL INFRASTUCTURE NSW

Project: PROPOSED SCHOOL UPGRADE

Location: PARRAMATTA EAST PUBLIC SCHOOL, PARRAMATTA, NSW

Job No.: E35073B **Method:** PUSH TUBE **R.L. Surface:** N/A

Date: 15/7/22 **Datum:** -

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

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION	■		■			0			FILL: Clayey sand, fine to medium grained, brown, trace of igneous and ironstone gravel, and root fibres.	M			GRASS COVER
										w>PL			SCREEN: 10.6kg 0-0.1m NO FCF
									FILL: Silty clay, medium to high plasticity, yellow brown, trace of igneous gravel, and ash.				SCREEN: 3.7kg 0.1-0.4m NO FCF
						0.5		CI-CH	Silty CLAY: medium to high plasticity, yellow brown mottled orange brown, trace of ironstone gravel.	w≈PL			RESIDUAL
	■		■			1			as above, but grey and orange brown.				
									END OF BOREHOLE AT 1.3m				
						1.5							
						2							
						2.5							
						3							
						3.5							

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BOREHOLE LOG

Borehole No. **114** 1/1

Client: SCHOOL INFRASTUCTURE NSW

Project: PROPOSED SCHOOL UPGRADE

Location: PARRAMATTA EAST PUBLIC SCHOOL, PARRAMATTA, NSW

Job No.: E35073B **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 15/7/22 **Datum:** -

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

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION	■		■			0			FILL: Silty clay, low to medium plasticity, dark brown, trace of ironstone gravel, and root fibres.	w>PL			GRASS COVER
								CI-CH	Silty CLAY: medium to high plasticity, yellow brown mottled orange brown, trace of ironstone gravel.	w>PL			SCREEN: 10.1kg 0-0.1m NO FCF
	■		■			0.5			END OF BOREHOLE AT 0.5m				SCREEN: 4.3kg 0.1-0.2m NO FCF RESIDUAL
						1							
						1.5							
						2							
						2.5							
						3							
						3.5							

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BOREHOLE LOG

Borehole No. 115 1/1

Client: SCHOOL INFRASTUCTURE NSW

Project: PROPOSED SCHOOL UPGRADE

Location: PARRAMATTA EAST PUBLIC SCHOOL, PARRAMATTA, NSW

Job No.: E35073B **Method:** PUSH TUBE **R.L. Surface:** N/A

Date: 14/7/22 **Datum:** -

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

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION	■		■			0			FILL: Clayey sand, fine to medium grained, brown, trace of ironstone gravel, bricks and brick fragments, steel, and root fibres.	M			GRAS COVER
								CI-CH	Silty CLAY: medium to high plasticity, yellow brown mottled orange brown, trace of ironstone gravel.	w≈PL			SCREEN: 15.18kg 0-0.15m NO FCF RESIDUAL
						0.5							
	■					1		-	Extremely Weathered sandstone: sandy CLAY, low to medium plasticity, grey, fine grained sand.	XW			HAWKESBURY SANDSTONE
									END OF BOREHOLE AT 1.0m				PUSHTUBE REFUSAL ON SANDSTONE BEDROCK
						1.5							
						2							
						2.5							
						3							
						3.5							

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BOREHOLE LOG

Borehole No. **116** 1/1

SDUP6: PFAS: ASB: 0-0.1m

Client: SCHOOL INFRASTUCTURE NSW

Project: PROPOSED SCHOOL UPGRADE

Location: PARRAMATTA EAST PUBLIC SCHOOL, PARRAMATTA, NSW

Job No.: E35073B **Method:** PUSH TUBE **R.L. Surface:** N/A

Date: 14/7/22 **Datum:** -

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

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION	■		■			0			FILL: Silty clay, low to medium plasticity, brown, trace of ironstone gravel, plastic and steel fragments, and root fibres.	w>PL			GRASS COVER SCREEN: 11.48kg 0-0.1m FCF1, FCF2 & FCF3
						0.5		CI-CH	Silty CLAY: medium to high plasticity, yellow brown, trace of ironstone gravel, and root fibres.	w≈PL			SCREEN: 11.13kg 0.1-0.3m NO FCF RESIDUAL
	■		■			1		-	Extremely Weathered sandstone: sandy CLAY, low to medium plasticity, yellow brown and grey, trace of ironstone gravel.	XW			HAWKESBURY SANDSTONE
									END OF BOREHOLE AT 1.2m				
						1.5							
						2							
						2.5							
						3							
						3.5							

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BOREHOLE LOG

Borehole No. 117
1/1

Client: SCHOOL INFRASTUCTURE NSW

Project: PROPOSED SCHOOL UPGRADE

Location: PARRAMATTA EAST PUBLIC SCHOOL, PARRAMATTA, NSW

Job No.: E35073B **Method:** PUSH TUBE **R.L. Surface:** N/A

Date: 14/7/22 **Datum:** -

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

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION	■		■			0			FILL: Silty gravelly clay, low plasticity, brown, fine to medium grained, sub-angular, igneous and ironstone gravel, trace of sand, slag and root fibres.	w>PL			GRASS COVER
	■		■					CI-CH	Silty CLAY: medium to high plasticity, yellow brown, trace of ironstone gravel, and root fibres.	w≈PL			SCREEN: 11.2kg 0-0.1m NO FCF
	■		■			0.5							SCREEN: 6.18kg 0.1-0.2m NO FCF
													RESIDUAL
						1			END OF BOREHOLE AT 1.0m				PUSH TUBE REFUSAL ON INFERRED SANDSTONE BEDROCK
						1.5							
						2							
						2.5							
						3							
						3.5							

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BOREHOLE LOG

Borehole No. **118** 1/1

SDUP7: PFAS: ASB: 0-0.1m

Client: SCHOOL INFRASTUCTURE NSW

Project: PROPOSED SCHOOL UPGRADE

Location: PARRAMATTA EAST PUBLIC SCHOOL, PARRAMATTA, NSW

Job No.: E35073B **Method:** PUSH TUBE **R.L. Surface:** N/A

Date: 14/7/22 **Datum:** -

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

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION	■		■			0			FILL: Clayey gravelly sand, fine to medium grained, brown, fine to medium grained, sub angular,	M			GRASS COVER
	■		■					CI-CH	ironstone gravel, trace of bricks and steel fragments, slag and root fibres.	w≈PL			SCREEN: 11.88kg 0-0.1m FCF1 & FCF2
	■		■			0.5			Silty CLAY: medium to high plasticity, yellow brown, trace of ironstone gravel, and root fibres.				SCREEN: 5.2kg 0.1-0.2m NO FCF
									as above, but grey mottled orange brown.				RESIDUAL
						1			END OF BOREHOLE AT 1.0m				
						1.5							
						2							
						2.5							
						3							
						3.5							

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BOREHOLE LOG

Borehole No. **119** 1/1

Client: SCHOOL INFRASTUCTURE NSW

Project: PROPOSED SCHOOL UPGRADE

Location: PARRAMATTA EAST PUBLIC SCHOOL, PARRAMATTA, NSW

Job No.: E35073B **Method:** PUSH TUBE **R.L. Surface:** N/A

Date: 14/7/22 **Datum:** -

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

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION	■		■			0			FILL: Silty clay, low to medium plasticity, brown, trace of sand, ironstone gravel and slag.	w>PL			SCREEN: 10.55kg 0-0.15m NO FCF
								CI-CH	Silty CLAY: medium to high plasticity, yellow brown, trace of sand and ironstone gravel.	w>PL			RESIDUAL
	■		■			0.5							
	■		■			1			as above, but grey, without sand.	w≈PL			
									END OF BOREHOLE AT 1.3m				
						1.5							
						2							
						2.5							
						3							
						3.5							

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BOREHOLE LOG

Borehole No. 120 1/1

Client: SCHOOL INFRASTUCTURE NSW

Project: PROPOSED SCHOOL UPGRADE

Location: PARRAMATTA EAST PUBLIC SCHOOL, PARRAMATTA, NSW

Job No.: E35073B **Method:** PUSH TUBE **R.L. Surface:** N/A

Date: 14/7/22 **Datum:** -

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

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLET-ION	■		■			0			FILL: Silty clay, low to medium plasticity, brown, trace of sand, ironstone gravel and root fibres.	w>PL			SCREEN: 11.6kg 0-0.1m FCF1 & FCF2
													SCREEN: 11.06kg 0.1-0.4m FCF3 & FCF4
	■		■			0.5		CI-CH	Silty CLAY: medium to high plasticity, yellow brown, trace of ironstone gravel.	w≈PL			RESIDUAL
	■		■			1			as above, but grey and orange brown.				
						1.5			END OF BOREHOLE AT 1.3m				
						2							
						2.5							
						3							
						3.5							

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BOREHOLE LOG

Borehole No. 121 1/1

SDUP5: PFAS: ASB: 0-0.1m

Client: SCHOOL INFRASTUCTURE NSW

Project: PROPOSED SCHOOL UPGRADE

Location: PARRAMATTA EAST PUBLIC SCHOOL, PARRAMATTA, NSW

Job No.: E35073B **Method:** PUSH TUBE **R.L. Surface:** N/A

Date: 14/7/22 **Datum:** -

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

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION	■		■			0			FILL: Silty clay, medium to high plasticity, brown, trace of ironstone gravel and root fibres.	w>PL			SCREEN: 12.98kg 0-0.1m FCF1
	■		■			0.5		CI-CH	Silty CLAY: medium to high plasticity, yellow brown, trace of sand and ironstone gravel.	w≈PL			SCREEN: 4.36kg 0.1-0.2m NO FCF
	■		■			1			as above, but without sand.				RESIDUAL
									END OF BOREHOLE AT 1.4m				
						1.5							
						2							
						2.5							
						3							
						3.5							

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BOREHOLE LOG

Borehole No. 122 1/1

Client: SCHOOL INFRASTUCTURE NSW

Project: PROPOSED SCHOOL UPGRADE

Location: PARRAMATTA EAST PUBLIC SCHOOL, PARRAMATTA, NSW

Job No.: E35073B **Method:** PUSH TUBE **R.L. Surface:** N/A

Date: 14/7/22 **Datum:** -

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

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION	■		■			0			FILL: Silty clay, low to medium plasticity, brown, trace of igneous and ironstone gravel, concrete and brick fragments and root fibres.	w>PL			GRASS COVER SCREEN: 10.75kg 0-0.1m FCF1, FCF2 & FCF3
						0.5		CI-CH	Silty CLAY: medium to high plasticity, yellow brown, trace of ironstone gravel.	w≈PL			SCREEN: 5.49kg 0.1-0.3 NO FCF RESIDUAL
						1			as above, but grey.	w<PL			
						1.5			END OF BOREHOLE AT 1.4m				
						2							
						2.5							
						3							
						3.5							

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BOREHOLE LOG

Borehole No. 123 1/1

Client: SCHOOL INFRASTUCTURE NSW

Project: PROPOSED SCHOOL UPGRADE

Location: PARRAMATTA EAST PUBLIC SCHOOL, PARRAMATTA, NSW

Job No.: E35073B **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 20/7/22 **Datum:** -

Plant Type: - **Logged/Checked by:** A.D./T.H.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLET-ION	■		■			0			FILL: Silty sandy clay, medium to high plasticity, brown, fine to medium grained sand, trace of ironstone gravel, and root fibres.	w≈PL			MULCH COVER
								CI-CH	Silty CLAY: medium to high plasticity, yellow brown mottled orange brown, trace of ironstone gravel and ash.	w≈PL			SCREEN: 10.61kg 0-0.1m NO FCF RESIDUAL
	■		■			0.5							
									END OF BOREHOLE AT 0.8m				
						1							
						1.5							
						2							
						2.5							
						3							
						3.5							

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BOREHOLE LOG

Borehole No. 124 1/1

Client: SCHOOL INFRASTUCTURE NSW

Project: PROPOSED SCHOOL UPGRADE

Location: PARRAMATTA EAST PUBLIC SCHOOL, PARRAMATTA, NSW

Job No.: E35073B **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 20/7/22 **Datum:** -

Plant Type: - **Logged/Checked by:** N.F./

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLET-ION	■		■			0			FILL: Silty clay, medium to high plasticity, brown, trace of sand, ironstone and sandstone gravel, brick fragments, ash, and root fibres.	w≈PL			GRASS COVER
	■		■					CI-CH	Silty CLAY: medium to high plasticity, yellow brown mottled orange brown, trace of sand, ironstone gravel, and ash.	w≈PL			SCREEN: 12.11kg 0-0.1m NO FCF RESIDUAL
						0.5			END OF BOREHOLE AT 0.6m				
						1							
						1.5							
						2							
						2.5							
						3							
						3.5							

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REPORT EXPLANATION NOTES

INTRODUCTION

These notes have been provided to amplify the geotechnical report in regard to classification methods, field procedures and certain matters relating to the Comments and Recommendations section. Not all notes are necessarily relevant to all reports.

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. Geotechnical engineering involves 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 geotechnical 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) is referred to as 'laminite'.

SAMPLING

Sampling is carried out during drilling or from other excavations to allow engineering examination (and laboratory testing where required) of the soil or rock.

Disturbed samples taken during drilling provide information on plasticity, grain size, colour, moisture content, minor constituents and, depending upon the degree of disturbance, some information on strength and structure. Bulk samples are similar but of greater volume required for some test procedures.

Undisturbed samples are taken by pushing a thin-walled sample tube, usually 50mm diameter (known as a U50), into the soil and withdrawing it with a sample of the soil contained in a relatively undisturbed state. Such samples yield information on structure and strength, and are necessary for laboratory determination of shrink-swell behaviour, strength and compressibility. Undisturbed sampling is generally effective only in cohesive soils.

Details of the type and method of sampling used are given on the attached logs.

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.

Cone Penetrometer Testing (CPT) and Interpretation: The cone penetrometer is sometimes referred to as a Dutch Cone. The test is described in Australian Standard 1289.6.5.1–1999 (R2013) *'Methods of Testing Soils for Engineering Purposes, Soil Strength and Consolidation Tests – Determination of the Static Cone Penetration Resistance of a Soil – Field Test using a Mechanical and Electrical Cone or Friction-Cone Penetrometer'*.

In the tests, a 35mm or 44mm diameter rod with a conical tip is pushed continuously into the soil, the reaction being provided by a specially designed truck or rig which is fitted with a hydraulic ram system. Measurements are made of the end bearing resistance on the cone and the frictional resistance on a separate 134mm or 165mm long sleeve, immediately behind the cone. Transducers in the tip of the assembly are electrically connected by wires passing through the centre of the push rods to an amplifier and recorder unit mounted on the control truck. The CPT does not provide soil sample recovery.

As penetration occurs (at a rate of approximately 20mm per second), the information is output as incremental digital records every 10mm. The results given in this report have been plotted from the digital data.

The information provided on the charts comprise:

- Cone resistance – the actual end bearing force divided by the cross sectional area of the cone – expressed in MPa. There are two scales presented for the cone resistance. The lower scale has a range of 0 to 5MPa and the main scale has a range of 0 to 50MPa. For cone resistance values less than 5MPa, the plot will appear on both scales.
- Sleeve friction – the frictional force on the sleeve divided by the surface area – expressed in kPa.
- Friction ratio – the ratio of sleeve friction to cone resistance, expressed as a percentage.

  The ratios of the sleeve resistance to cone resistance will vary with the type of soil encountered, with higher relative friction in clays than in sands. Friction ratios of 1% to 2% are commonly encountered in sands and occasionally very soft clays, rising to 4% to 10% in stiff clays and peats. Soil descriptions based on cone resistance and friction ratios are only inferred and must not be considered as exact.

Correlations between CPT and SPT values can be developed for both sands and clays but may be site specific.

Interpretation of CPT values can be made to empirically derive modulus or compressibility values to allow calculation of foundation settlements.

Stratification can be inferred from the cone and friction traces and from experience and information from nearby boreholes etc. Where shown, this information is presented for general guidance, but must be regarded as interpretive. The test method provides a continuous profile of engineering properties but, where precise information on soil classification is required, direct drilling and sampling may be preferable.

There are limitations when using the CPT in that it may not penetrate obstructions within any fill, thick layers of hard clay and very dense sand, gravel and weathered bedrock. Normally a 'dummy' cone is pushed through fill to protect the equipment. No information is recorded by the 'dummy' probe.

Flat Dilatometer Test: The flat dilatometer (DMT), also known as the Marchetti Dilometer comprises a stainless steel blade having a flat, circular steel membrane mounted flush on one side.

The blade is connected to a control unit at ground surface by a pneumatic-electrical tube running through the insertion rods. A gas tank, connected to the control unit by a pneumatic cable, supplies the gas pressure required to expand the membrane. The control unit is equipped with a pressure regulator, pressure gauges, an audio-visual signal and vent valves.

The blade is advanced into the ground using our CPT rig or one of our drilling rigs, and can be driven into the ground using an SPT hammer. As soon as the blade is in place, the membrane is inflated, and the pressure required to lift the membrane (approximately 0.1mm) is recorded. The pressure then required to lift the centre of the membrane by an additional 1mm is recorded. The membrane is then deflated before pushing to the next depth increment, usually 200mm down. The pressure readings are corrected for membrane stiffness.

The DMT is used to measure material index (I_D), horizontal stress index (K_D), and dilatometer modulus (E_D). Using established correlations, the DMT results can also be used to assess the 'at rest' earth pressure coefficient (K_o), over-consolidation ratio (OCR), undrained shear strength (C_u), friction angle (ϕ), coefficient of consolidation (C_h), coefficient of permeability (K_h), unit weight (γ), and vertical drained constrained modulus (M).

The seismic dilatometer (SDMT) is the combination of the DMT with an add-on seismic module for the measurement of shear wave velocity (V_s). Using established correlations, the SDMT results can also be used to assess the small strain modulus (G_o).

Portable Dynamic Cone Penetrometers: Portable Dynamic Cone Penetrometer (DCP) tests are carried out by driving a 16mm diameter rod with a 20mm diameter cone end with a 9kg hammer dropping 510mm. The test is described in Australian Standard 1289.6.3.2–1997 (R2013) *'Methods of Testing Soils for Engineering Purposes, Soil Strength and Consolidation Tests – Determination of the Penetration Resistance of a Soil – 9kg Dynamic Cone Penetrometer Test'*.

The results are used to assess the relative compaction of fill, the relative density of granular soils, and the strength of cohesive soils. Using established correlations, the DCP test results can also be used to assess California Bearing Ratio (CBR).

Refusal of the DCP 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.

Vane Shear Test: The vane shear test is used to measure the undrained shear strength (C_u) of typically very soft to firm fine grained cohesive soils. The vane shear is normally performed in the bottom of a borehole, but can be completed from surface level, the bottom and sides of test pits, and on recovered undisturbed tube samples (when using a hand vane).

The vane comprises four rectangular blades arranged in the form of a cross on the end of a thin rod, which is coupled to the bottom of a drill rod string when used in a borehole. The size of the vane is dependent on the strength of the fine grained cohesive soils; that is, larger vanes are normally used for very low strength soils. For borehole testing, the size of the vane can be limited by the size of the casing that is used.

For testing inside a borehole, a device is used at the top of the casing, which suspends the vane and rods so that they do not sink under self-weight into the 'soft' soils beyond the depth at which the test is to be carried out. A calibrated torque head is used to rotate the rods and vane and to measure the resistance of the vane to rotation.

With the vane in position, torque is applied to cause rotation of the vane at a constant rate. A rate of 6° per minute is the common rotation rate. Rotation is continued until the soil is sheared and the maximum torque has been recorded. This value is then used to calculate the undrained shear strength. The vane is then rotated rapidly a number of times and the operation repeated until a constant torque reading is obtained. This torque value is used to calculate the remoulded shear strength. Where appropriate, friction on the vane rods is measured and taken into account in the shear strength calculation.

LOGS

The borehole or test pit logs presented herein are an engineering and/or geological 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, strength and material type is much greater than with natural soil deposits. Consequently, there is an increased risk of adverse engineering characteristics or behaviour. If the volume and quality of fill is of importance to a project, then frequent test pit excavations are preferable to boreholes.

LABORATORY TESTING

Laboratory testing is normally carried out in accordance with Australian Standard 1289 *'Methods of Testing Soils for Engineering Purposes'* or appropriate NSW Government Roads & Maritime Services (RMS) test methods. Details of the test procedure used are given on the individual report forms.

ENGINEERING REPORTS

Engineering reports are prepared by qualified personnel and are based on the information obtained and on current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal (eg. a three storey building) the information and interpretation may not be relevant if the design proposal is changed (eg. to a twenty storey building). If this happens, the Company will be pleased to review the report and the sufficiency of the investigation work.

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

- Unexpected variations in ground conditions – the potential for this will be partially dependent on borehole spacing and sampling frequency as well as investigation technique.
- Changes in policy or interpretation of policy by statutory authorities.
- The actions of persons or contractors responding to commercial pressures.
- Details of the development that the Company could not reasonably be expected to anticipate.

If these occur, the Company will be pleased to assist with investigation or advice to resolve any problems occurring.

SITE ANOMALIES

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

REPRODUCTION OF INFORMATION FOR CONTRACTUAL PURPOSES

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

Copyright in all documents (such as drawings, borehole or test pit logs, reports and specifications) provided by the Company shall remain the property of Jeffery and Katauskas Pty Ltd. Subject to the payment of all fees due, the Client alone shall have a licence to use the documents provided for the sole purpose of completing the project to which they relate. Licence to use the documents may be revoked without notice if the Client is in breach of any obligation to make a payment to us.

REVIEW OF DESIGN

Where major civil or structural developments are proposed or where only a limited investigation has been completed or where the geotechnical conditions/constraints are quite complex, it is prudent to have a joint design review which involves an experienced geotechnical engineer/engineering geologist.

SITE INSPECTION

The Company will always be pleased to provide engineering inspection services for geotechnical aspects of work to which this report is related.

Requirements could range from:

i) a site visit to confirm that conditions exposed are no worse than those interpreted, to

ii) a visit to assist the contractor or other site personnel in identifying various soil/rock types and appropriate footing or pile founding depths, or

iii) full time engineering presence on site.

SYMBOL LEGENDS

SOIL


FILL


TOPSOIL


CLAY (CL, CI, CH)


SILT (ML, MH)


SAND (SP, SW)


GRAVEL (GP, GW)


SANDY CLAY (CL, CI, CH)


SILTY CLAY (CL, CI, CH)


CLAYEY SAND (SC)


SILTY SAND (SM)


GRAVELLY CLAY (CL, CI, CH)


CLAYEY GRAVEL (GC)


SANDY SILT (ML, MH)


PEAT AND HIGHLY ORGANIC SOILS (Pt)

ROCK


CONGLOMERATE


SANDSTONE


SHALE/MUDSTONE


SILTSTONE


CLAYSTONE


COAL


LAMINITE


LIMESTONE


PHYLLITE, SCHIST


TUFF


GRANITE, GABBRO


DOLERITE, DIORITE


BASALT, ANDESITE


QUARTZITE

OTHER MATERIALS


BRICKS OR PAVERS


CONCRETE


ASPHALTIC CONCRETE

CLASSIFICATION OF COARSE AND FINE GRAINED SOILS

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

Major Divisions		Group Symbol	Typical Names	Field Classification of Silt and Clay			Laboratory Classification
				Dry Strength	Dilatancy	Toughness	% < 0.075mm
Fine 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:

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

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

NOTES:

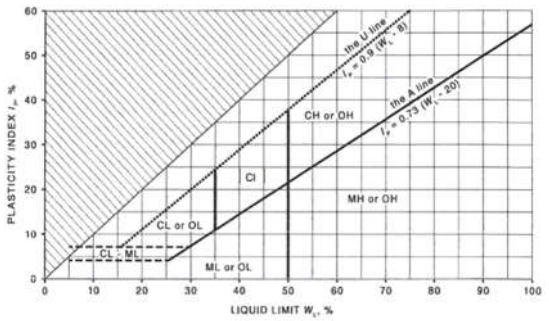
1 For a coarse grained soil with a fines content between 5% and 12%, the soil is given a dual classification comprising the two group symbols separated by a dash; for example, for a poorly graded gravel with between 5% and 12% silt fines, the classification is GP-GM.

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

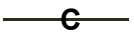
3 Clay soils with liquid limits > 35% and ≤ 50% may be classified as being of medium plasticity.

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

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



LOG SYMBOLS

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

Log Column	Symbol	Definition
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

Term		Abbreviation		Definition
Residual Soil		RS		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.
Extremely Weathered		XW		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.
Highly Weathered	Distinctly Weathered (Note 1)	HW	DW	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.
Moderately Weathered		MW		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.
Slightly Weathered		SW		Rock is partially discoloured with staining or bleaching along joints but shows little or no change of strength from fresh rock.
Fresh		FR		Rock shows no sign of decomposition of individual minerals or colour changes.

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.

Abbreviations Used in Defect Description

Cored Borehole Log Column		Symbol Abbreviation	Description
Point Load Strength Index		• 0.6	Axial point load strength index test result (MPa)
		x 0.6	Diametral point load strength index test result (MPa)
Defect Details	– Type	Be	Parting – bedding or cleavage
		CS	Clay seam
		Cr	Crushed/sheared seam or zone
		J	Joint
		Jh	Healed joint
		Ji	Incipient joint
		XWS	Extremely weathered seam
	– Orientation	Degrees	Defect orientation is measured relative to normal to the core axis (ie. relative to the horizontal for a vertical borehole)
	– Shape	P	Planar
		C	Curved
		Un	Undulating
		St	Stepped
		Ir	Irregular
	– Roughness	Vr	Very rough
		R	Rough
		S	Smooth
		Po	Polished
		Sl	Slickensided
	– Infill Material	Ca	Calcite
		Cb	Carbonaceous
		Clay	Clay
		Fe	Iron
		Qz	Quartz
		Py	Pyrite
	– Coatings	Cn	Clean
		Sn	Stained – no visible coating, surface is discoloured
		Vn	Veneer – visible, too thin to measure, may be patchy
		Ct	Coating ≤ 1mm thick
		Filled	Coating > 1mm thick
	– Thickness	mm.t	Defect thickness measured in millimetres

Appendix E: Laboratory Reports & COC Documents

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CERTIFICATE OF ANALYSIS 300587

Client Details

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

Sample Details

Your Reference	**E35073B, Parramatta East**
Number of Samples	71 Soil, 1 Material
Date samples received	15/07/2022
Date completed instructions received	15/07/2022

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	22/07/2022
Date of Issue	22/07/2022

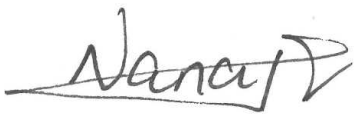
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Authorised by Asbestos Approved Signatory: Lucy Zhu

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Authorised By



Nancy Zhang, Laboratory Manager

PFAS in Soils Extended					
Our Reference		300587-16	300587-22	300587-29	300587-31
Your Reference	UNITS	BH102	BH104	SDUP3	TB
Depth		0-0.1	0-0.2	-	-
Date Sampled		13/07/2022	13/07/2022	13/07/2022	13/07/2022
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	19/07/2022	19/07/2022	19/07/2022	19/07/2022
Date analysed	-	19/07/2022	19/07/2022	19/07/2022	19/07/2022
Perfluorobutanesulfonic acid	µg/kg	<0.1	<0.1	<0.1	<0.1
Perfluoropentanesulfonic acid	µg/kg	<0.1	<0.1	<0.1	<0.1
Perfluorohexanesulfonic acid - PFHxS	µg/kg	<0.1	<0.1	<0.1	<0.1
Perfluoroheptanesulfonic acid	µg/kg	<0.1	<0.1	<0.1	<0.1
Perfluorooctanesulfonic acid PFOS	µg/kg	5.7	4.5	5.4	<0.1
Perfluorodecanesulfonic acid	µg/kg	<0.2	<0.2	<0.2	<0.2
Perfluorobutanoic acid	µg/kg	<0.2	<0.2	<0.2	<0.2
Perfluoropentanoic acid	µg/kg	<0.2	<0.2	<0.2	<0.2
Perfluorohexanoic acid	µg/kg	0.1	<0.1	0.1	<0.1
Perfluoroheptanoic acid	µg/kg	<0.1	<0.1	<0.1	<0.1
Perfluorooctanoic acid PFOA	µg/kg	0.3	0.3	0.4	<0.1
Perfluorononanoic acid	µg/kg	0.2	<0.1	0.2	<0.1
Perfluorodecanoic acid	µg/kg	<0.5	<0.5	0.6	<0.5
Perfluoroundecanoic acid	µg/kg	<0.5	<0.5	<0.5	<0.5
Perfluorododecanoic acid	µg/kg	<0.5	<0.5	<0.5	<0.5
Perfluorotridecanoic acid	µg/kg	<0.5	<0.5	<0.5	<0.5
Perfluorotetradecanoic acid	µg/kg	<5	<5	<5	<5
4:2 FTS	µg/kg	<0.1	<0.1	<0.1	<0.1
6:2 FTS	µg/kg	<0.1	<0.1	<0.1	<0.1
8:2 FTS	µg/kg	<0.2	<0.2	<0.2	<0.2
10:2 FTS	µg/kg	<0.2	<0.2	<0.2	<0.2
Perfluorooctane sulfonamide	µg/kg	<1	<1	<1	<1
N-Methyl perfluorooctane sulfonamide	µg/kg	<1	<1	<1	<1
N-Ethyl perfluorooctanesulfon amide	µg/kg	<1	<1	<1	<1
N-Me perfluorooctanesulfonamid oethanol	µg/kg	<1	<1	<1	<1
N-Et perfluorooctanesulfonamid oethanol	µg/kg	<5	<5	<5	<5
MePerfluorooctanesulf- amid oacetic acid	µg/kg	<0.2	<0.2	<0.2	<0.2
EtPerfluorooctanesulf amid oacetic acid	µg/kg	<0.2	<0.2	<0.2	<0.2
Surrogate $^{13}C_8$ *PFOS*	%	92	102	95	98
Surrogate $^{13}C_2$ *PFOA*	%	95	103	97	93
Extracted ISTD $^{13}C_3$ *PFBS*	%	99	101	98	112
Extracted ISTD $^{18}O_2$ *PFHxS*	%	123	122	119	133
Extracted ISTD $^{13}C_4$ *PFOS*	%	119	111	113	130

PFAS in Soils Extended					
Our Reference		300587-16	300587-22	300587-29	300587-31
Your Reference	UNITS	BH102	BH104	SDUP3	TB
Depth		0-0.1	0-0.2	-	-
Date Sampled		13/07/2022	13/07/2022	13/07/2022	13/07/2022
Type of sample		Soil	Soil	Soil	Soil
Extracted ISTD $^{13}C_4$ *PFBA*	%	93	90	88	102
Extracted ISTD $^{13}C_3$ *PFPeA*	%	98	101	96	109
Extracted ISTD $^{13}C_2$ *PFHxA*	%	102	106	101	116
Extracted ISTD $^{13}C_4$ *PFHpA*	%	130	132	124	146
Extracted ISTD $^{13}C_4$ *PFOA*	%	132	122	124	147
Extracted ISTD $^{13}C_5$ *PFNA*	%	140	133	129	153
Extracted ISTD $^{13}C_2$ *PFDA*	%	102	95	99	106
Extracted ISTD $^{13}C_2$ *PFUnDA*	%	103	114	113	124
Extracted ISTD $^{13}C_2$ *PFDoDA*	%	126	124	123	145
Extracted ISTD $^{13}C_2$ *PFTeDA*	%	102	97	91	120
Extracted ISTD $^{13}C_2$ *4:2FTS*	%	102	102	99	109
Extracted ISTD $^{13}C_2$ *6:2FTS*	%	151	155	147	150
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	#	166	#	#
Extracted ISTD $^{13}C_8$ *FOSA*	%	133	108	126	151
Extracted ISTD d_3 *N MeFOSA*	%	110	103	101	125
Extracted ISTD d_5 *N EtFOSA*	%	133	123	124	153
Extracted ISTD d_7 *N MeFOSE*	%	148	134	133	#
Extracted ISTD d_9 *N EtFOSE*	%	121	111	112	134
Extracted ISTD d_3 *N MeFOSAA*	%	132	139	138	129
Extracted ISTD d_5 *N EtFOSAA*	%	140	111	139	129
Total Positive PFHxS & PFOS	µg/kg	5.7	4.5	5.4	<0.1
Total Positive PFOS & PFOA	µg/kg	6.0	4.8	5.8	<0.1
Total Positive PFAS	µg/kg	6.3	4.8	6.7	<0.1

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		300587-1	300587-2	300587-4	300587-7	300587-10
Your Reference	UNITS	BH1	BH2	BH3	BH4	BH5
Depth		0-0.1	0.1-0.4	0.04-0.1	0.04-0.3	0.04-0.3
Date Sampled		12/07/2022	12/07/2022	12/07/2022	13/07/2022	13/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	19/07/2022	19/07/2022	19/07/2022	19/07/2022	19/07/2022
Date analysed	-	20/07/2022	20/07/2022	20/07/2022	20/07/2022	20/07/2022
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	%	91	98	82	85	84

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		300587-13	300587-16	300587-19	300587-22	300587-24
Your Reference	UNITS	BH101	BH102	BH103	BH104	BH112
Depth		0-0.1	0-0.1	0-0.1	0-0.2	0-0.1
Date Sampled		13/07/2022	13/07/2022	13/07/2022	13/07/2022	13/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	19/07/2022	19/07/2022	19/07/2022	19/07/2022	19/07/2022
Date analysed	-	20/07/2022	20/07/2022	20/07/2022	20/07/2022	20/07/2022
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	%	90	95	84	85	107

vTRH(C6-C10)/BTEXN in Soil					
Our Reference		300587-27	300587-29	300587-30	300587-31
Your Reference	UNITS	SDUP1	SDUP3	TS	TB
Depth		-	-	-	-
Date Sampled		12/07/2022	13/07/2022	13/07/2022	13/07/2022
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	19/07/2022	19/07/2022	19/07/2022	19/07/2022
Date analysed	-	20/07/2022	20/07/2022	20/07/2022	20/07/2022
TRH C_6 - C_9	mg/kg	<25	<25	[NA]	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	[NA]	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	[NA]	<25
Benzene	mg/kg	<0.2	<0.2	82%	<0.2
Toluene	mg/kg	<0.5	<0.5	81%	<0.5
Ethylbenzene	mg/kg	<1	<1	83%	<1
m+p-xylene	mg/kg	<2	<2	83%	<2
o-Xylene	mg/kg	<1	<1	83%	<1
Naphthalene	mg/kg	<1	<1	[NA]	<1
Total +ve Xylenes	mg/kg	<1	<1	[NA]	<1
Surrogate aaa-Trifluorotoluene	%	107	87	82	95

svTRH (C10-C40) in Soil						
Our Reference		300587-1	300587-2	300587-4	300587-7	300587-10
Your Reference	UNITS	BH1	BH2	BH3	BH4	BH5
Depth		0-0.1	0.1-0.4	0.04-0.1	0.04-0.3	0.04-0.3
Date Sampled		12/07/2022	12/07/2022	12/07/2022	13/07/2022	13/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	18/07/2022	18/07/2022	18/07/2022	18/07/2022	18/07/2022
Date analysed	-	19/07/2022	20/07/2022	20/07/2022	20/07/2022	20/07/2022
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	220	110	<100
TRH C_{29} - C_{36}	mg/kg	<100	220	600	380	<100
Total +ve TRH (C10-C36)	mg/kg	<50	220	820	490	<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	240	600	360	<100
TRH >C_{34} -C_{40}	mg/kg	<100	320	940	610	110
Total +ve TRH (>C10-C40)	mg/kg	<50	560	1,500	970	110
Surrogate o-Terphenyl	%	86	81	86	80	81

svTRH (C10-C40) in Soil						
Our Reference		300587-13	300587-16	300587-19	300587-22	300587-24
Your Reference	UNITS	BH101	BH102	BH103	BH104	BH112
Depth		0-0.1	0-0.1	0-0.1	0-0.2	0-0.1
Date Sampled		13/07/2022	13/07/2022	13/07/2022	13/07/2022	13/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	18/07/2022	18/07/2022	18/07/2022	18/07/2022	18/07/2022
Date analysed	-	20/07/2022	20/07/2022	20/07/2022	20/07/2022	20/07/2022
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	%	82	81	79	78	82

svTRH (C10-C40) in Soil				
Our Reference		300587-27	300587-29	300587-31
Your Reference	UNITS	SDUP1	SDUP3	TB
Depth		-	-	-
Date Sampled		12/07/2022	13/07/2022	13/07/2022
Type of sample		Soil	Soil	Soil
Date extracted	-	18/07/2022	18/07/2022	18/07/2022
Date analysed	-	20/07/2022	20/07/2022	20/07/2022
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50
Surrogate o-Terphenyl	%	80	86	79

PAHs in Soil						
Our Reference		300587-1	300587-2	300587-4	300587-7	300587-10
Your Reference	UNITS	BH1	BH2	BH3	BH4	BH5
Depth		0-0.1	0.1-0.4	0.04-0.1	0.04-0.3	0.04-0.3
Date Sampled		12/07/2022	12/07/2022	12/07/2022	13/07/2022	13/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	19/07/2022	19/07/2022	19/07/2022	19/07/2022	19/07/2022
Date analysed	-	19/07/2022	21/07/2022	21/07/2022	21/07/2022	21/07/2022
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.2	<0.1	<0.1	<0.1	0.2
Pyrene	mg/kg	0.2	<0.1	<0.1	<0.1	0.3
Benzo(a)anthracene	mg/kg	0.2	<0.1	<0.1	<0.1	0.2
Chrysene	mg/kg	0.1	<0.1	<0.1	<0.1	0.1
Benzo(b,j+k)fluoranthene	mg/kg	0.7	<0.2	<0.2	<0.2	0.3
Benzo(a)pyrene	mg/kg	0.3	<0.05	<0.05	<0.05	0.1
Indeno(1,2,3-c,d)pyrene	mg/kg	0.2	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.2	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	1.9	<0.05	<0.05	<0.05	1.2
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	85	89	82	86	83

PAHs in Soil						
Our Reference		300587-13	300587-16	300587-19	300587-22	300587-24
Your Reference	UNITS	BH101	BH102	BH103	BH104	BH112
Depth		0-0.1	0-0.1	0-0.1	0-0.2	0-0.1
Date Sampled		13/07/2022	13/07/2022	13/07/2022	13/07/2022	13/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	19/07/2022	19/07/2022	19/07/2022	19/07/2022	19/07/2022
Date analysed	-	19/07/2022	19/07/2022	19/07/2022	19/07/2022	19/07/2022
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	0.2	<0.1
Pyrene	mg/kg	<0.1	0.1	<0.1	0.2	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	0.2	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	0.2	0.3	0.2	0.6	0.2
Benzo(a)pyrene	mg/kg	0.07	0.1	0.05	0.3	0.1
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	0.1	<0.1	0.2	<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	0.3	0.64	0.3	2.1	0.4
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	0.5	<0.5
Surrogate p-Terphenyl-d14	%	86	87	91	91	86

PAHs in Soil				
Our Reference		300587-27	300587-29	300587-31
Your Reference	UNITS	SDUP1	SDUP3	TB
Depth		-	-	-
Date Sampled		12/07/2022	13/07/2022	13/07/2022
Type of sample		Soil	Soil	Soil
Date extracted	-	19/07/2022	19/07/2022	19/07/2022
Date analysed	-	19/07/2022	19/07/2022	19/07/2022
Naphthalene	mg/kg	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	0.1	<0.1
Pyrene	mg/kg	0.1	0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	0.1	<0.1
Chrysene	mg/kg	0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	0.5	0.4	<0.2
Benzo(a)pyrene	mg/kg	0.2	0.2	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	0.2	0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.2	<0.1	<0.1
Total +ve PAH's	mg/kg	1.5	1.0	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	87	96	90

Organochlorine Pesticides in soil						
Our Reference		300587-1	300587-2	300587-4	300587-7	300587-10
Your Reference	UNITS	BH1	BH2	BH3	BH4	BH5
Depth		0-0.1	0.1-0.4	0.04-0.1	0.04-0.3	0.04-0.3
Date Sampled		12/07/2022	12/07/2022	12/07/2022	13/07/2022	13/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	19/07/2022	19/07/2022	19/07/2022	19/07/2022	19/07/2022
Date analysed	-	19/07/2022	21/07/2022	21/07/2022	21/07/2022	21/07/2022
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	73	79	74	77	76

Organochlorine Pesticides in soil						
Our Reference		300587-13	300587-16	300587-19	300587-22	300587-24
Your Reference	UNITS	BH101	BH102	BH103	BH104	BH112
Depth		0-0.1	0-0.1	0-0.1	0-0.2	0-0.1
Date Sampled		13/07/2022	13/07/2022	13/07/2022	13/07/2022	13/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	19/07/2022	19/07/2022	19/07/2022	19/07/2022	19/07/2022
Date analysed	-	19/07/2022	19/07/2022	19/07/2022	19/07/2022	19/07/2022
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	75	77	79	78	76

Organochlorine Pesticides in soil			
Our Reference		300587-27	300587-29
Your Reference	UNITS	SDUP1	SDUP3
Depth		-	-
Date Sampled		12/07/2022	13/07/2022
Type of sample		Soil	Soil
Date extracted	-	19/07/2022	19/07/2022
Date analysed	-	19/07/2022	19/07/2022
alpha-BHC	mg/kg	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1
Surrogate TCMX	%	77	81

Organophosphorus Pesticides in Soil						
Our Reference		300587-1	300587-2	300587-4	300587-7	300587-10
Your Reference	UNITS	BH1	BH2	BH3	BH4	BH5
Depth		0-0.1	0.1-0.4	0.04-0.1	0.04-0.3	0.04-0.3
Date Sampled		12/07/2022	12/07/2022	12/07/2022	13/07/2022	13/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	19/07/2022	19/07/2022	19/07/2022	19/07/2022	19/07/2022
Date analysed	-	19/07/2022	21/07/2022	21/07/2022	21/07/2022	21/07/2022
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
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
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
Ethion	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
Surrogate TCMX	%	73	79	74	77	76

Organophosphorus Pesticides in Soil						
Our Reference		300587-13	300587-16	300587-19	300587-22	300587-24
Your Reference	UNITS	BH101	BH102	BH103	BH104	BH112
Depth		0-0.1	0-0.1	0-0.1	0-0.2	0-0.1
Date Sampled		13/07/2022	13/07/2022	13/07/2022	13/07/2022	13/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	19/07/2022	19/07/2022	19/07/2022	19/07/2022	19/07/2022
Date analysed	-	19/07/2022	19/07/2022	19/07/2022	19/07/2022	19/07/2022
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
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
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
Ethion	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
Surrogate TCMX	%	75	77	79	78	76

Organophosphorus Pesticides in Soil			
Our Reference		300587-27	300587-29
Your Reference	UNITS	SDUP1	SDUP3
Depth		-	-
Date Sampled		12/07/2022	13/07/2022
Type of sample		Soil	Soil
Date extracted	-	19/07/2022	19/07/2022
Date analysed	-	19/07/2022	19/07/2022
Dichlorvos	mg/kg	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1
Surrogate TCMX	%	77	81

PCBs in Soil						
Our Reference		300587-1	300587-2	300587-4	300587-7	300587-10
Your Reference	UNITS	BH1	BH2	BH3	BH4	BH5
Depth		0-0.1	0.1-0.4	0.04-0.1	0.04-0.3	0.04-0.3
Date Sampled		12/07/2022	12/07/2022	12/07/2022	13/07/2022	13/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	19/07/2022	19/07/2022	19/07/2022	19/07/2022	19/07/2022
Date analysed	-	19/07/2022	21/07/2022	21/07/2022	21/07/2022	21/07/2022
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	%	73	79	74	77	76

PCBs in Soil						
Our Reference		300587-13	300587-16	300587-19	300587-22	300587-24
Your Reference	UNITS	BH101	BH102	BH103	BH104	BH112
Depth		0-0.1	0-0.1	0-0.1	0-0.2	0-0.1
Date Sampled		13/07/2022	13/07/2022	13/07/2022	13/07/2022	13/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	19/07/2022	19/07/2022	19/07/2022	19/07/2022	19/07/2022
Date analysed	-	19/07/2022	19/07/2022	19/07/2022	19/07/2022	19/07/2022
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	%	75	77	79	78	76

PCBs in Soil			
Our Reference		300587-27	300587-29
Your Reference	UNITS	SDUP1	SDUP3
Depth		-	-
Date Sampled		12/07/2022	13/07/2022
Type of sample		Soil	Soil
Date extracted	-	19/07/2022	19/07/2022
Date analysed	-	19/07/2022	19/07/2022
Aroclor 1016	mg/kg	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1
Surrogate TCMX	%	77	81

Acid Extractable metals in soil						
Our Reference		300587-1	300587-2	300587-4	300587-7	300587-10
Your Reference	UNITS	BH1	BH2	BH3	BH4	BH5
Depth		0-0.1	0.1-0.4	0.04-0.1	0.04-0.3	0.04-0.3
Date Sampled		12/07/2022	12/07/2022	12/07/2022	13/07/2022	13/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	19/07/2022	19/07/2022	19/07/2022	19/07/2022	19/07/2022
Date analysed	-	20/07/2022	20/07/2022	20/07/2022	20/07/2022	20/07/2022
Arsenic	mg/kg	<4	4	5	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	26	10	12	6	10
Copper	mg/kg	26	16	34	76	13
Lead	mg/kg	41	7	6	3	23
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	9	9	16	34	4
Zinc	mg/kg	61	9	15	24	47

Acid Extractable metals in soil						
Our Reference		300587-13	300587-16	300587-19	300587-22	300587-24
Your Reference	UNITS	BH101	BH102	BH103	BH104	BH112
Depth		0-0.1	0-0.1	0-0.1	0-0.2	0-0.1
Date Sampled		13/07/2022	13/07/2022	13/07/2022	13/07/2022	13/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	19/07/2022	19/07/2022	19/07/2022	19/07/2022	19/07/2022
Date analysed	-	20/07/2022	20/07/2022	20/07/2022	20/07/2022	20/07/2022
Arsenic	mg/kg	5	4	<4	5	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	14	14	9	16	14
Copper	mg/kg	2	13	10	8	34
Lead	mg/kg	12	43	29	32	14
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	1	3	3	2	15
Zinc	mg/kg	8	61	52	30	38

Acid Extractable metals in soil					
Our Reference		300587-27	300587-29	300587-31	300587-73
Your Reference	UNITS	SDUP1	SDUP3	TB	BH1 - [TRIPLICATE]
Depth		-	-	-	0-0.1
Date Sampled		12/07/2022	13/07/2022	13/07/2022	12/07/2022
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	19/07/2022	19/07/2022	19/07/2022	19/07/2022
Date analysed	-	20/07/2022	20/07/2022	20/07/2022	20/07/2022
Arsenic	mg/kg	<4	<4	<4	4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	20	12	<1	15
Copper	mg/kg	43	21	<1	23
Lead	mg/kg	38	61	<1	28
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	14	4	<1	11
Zinc	mg/kg	100	96	<1	88

Moisture						
Our Reference		300587-1	300587-2	300587-4	300587-7	300587-10
Your Reference	UNITS	BH1	BH2	BH3	BH4	BH5
Depth		0-0.1	0.1-0.4	0.04-0.1	0.04-0.3	0.04-0.3
Date Sampled		12/07/2022	12/07/2022	12/07/2022	13/07/2022	13/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	18/07/2022	18/07/2022	18/07/2022	18/07/2022	18/07/2022
Date analysed	-	19/07/2022	19/07/2022	19/07/2022	19/07/2022	19/07/2022
Moisture	%	13	9.7	5.6	5.7	7.8

Moisture						
Our Reference		300587-13	300587-16	300587-19	300587-22	300587-24
Your Reference	UNITS	BH101	BH102	BH103	BH104	BH112
Depth		0-0.1	0-0.1	0-0.1	0-0.2	0-0.1
Date Sampled		13/07/2022	13/07/2022	13/07/2022	13/07/2022	13/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	18/07/2022	18/07/2022	18/07/2022	18/07/2022	18/07/2022
Date analysed	-	19/07/2022	19/07/2022	19/07/2022	19/07/2022	19/07/2022
Moisture	%	17	22	27	34	14

Moisture				
Our Reference		300587-27	300587-29	300587-31
Your Reference	UNITS	SDUP1	SDUP3	TB
Depth		-	-	-
Date Sampled		12/07/2022	13/07/2022	13/07/2022
Type of sample		Soil	Soil	Soil
Date prepared	-	18/07/2022	18/07/2022	18/07/2022
Date analysed	-	19/07/2022	19/07/2022	19/07/2022
Moisture	%	16	35	0.8

Asbestos ID - soils NEPM - ASB-001					
Our Reference		300587-1	300587-2	300587-4	300587-24
Your Reference	UNITS	BH1	BH2	BH3	BH112
Depth		0-0.1	0.1-0.4	0.04-0.1	0-0.1
Date Sampled		12/07/2022	12/07/2022	12/07/2022	13/07/2022
Type of sample		Soil	Soil	Soil	Soil
Date analysed	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022
Sample mass tested	g	805.99	850.59	484.31	699.02
Sample Description	-	Brown clayey soil & rocks	Brown coarse-grained soil & rocks	Brown bituminous soil & rocks	Brown clayey soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	Chrysotile asbestos detected 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
Total Asbestos[#1]	g/kg	0.1843	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	See Above	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	0.1485	–	–	–
FA and AF Estimation*	g	–	–	–	–
ACM >7mm Estimation*	%(w/w)	0.0184	<0.01	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001

Asbestos ID - materials		
Our Reference		300587-32
Your Reference	UNITS	FCF1-Surface
Depth		-
Date Sampled		13/07/2022
Type of sample		Material
Date analysed	-	19/07/2022
Mass / Dimension of Sample	-	50x20x5mm
Sample Description	-	Beige fibre cement material
Asbestos ID in materials	-	Chrysotile asbestos detected Amosite asbestos detected
Trace Analysis	-	[NT]

Misc Inorg - Soil						
Our Reference		300587-5	300587-11	300587-12	300587-33	300587-36
Your Reference	UNITS	BH3	BH5	BH5	BH1	BH1
Depth		0.4-0.5	0.5-0.95	1.5-1.7	0.5-0.7	1.8-2.0
Date Sampled		12/07/2022	13/07/2022	13/07/2022	12/07/2022	12/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022
Date analysed	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022
pH 1:5 soil:water	pH Units	5.8	4.9	5.6	4.4	4.5
Electrical Conductivity 1:5 soil:water	µS/cm	62	56	47	[NA]	93
Chloride, Cl 1:5 soil:water	mg/kg	10	21	38	<10	<10
Sulphate, SO4 1:5 soil:water	mg/kg	61	10	24	180	140
Resistivity in soil*	ohm m	160	180	210	81	110

Misc Inorg - Soil					
Our Reference		300587-40	300587-51	300587-58	300587-72
Your Reference	UNITS	BH1	BH3	BH3	BH5
Depth		4.5-4.7	2.4-2.5	6.3-6.5	3.3-3.5
Date Sampled		12/07/2022	12/07/2022	12/07/2022	13/07/2022
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022
Date analysed	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022
pH 1:5 soil:water	pH Units	6.2	5.7	6.1	5.9
Electrical Conductivity 1:5 soil:water	µS/cm	[NA]	[NA]	[NA]	32
Chloride, Cl 1:5 soil:water	mg/kg	10	24	<10	10
Sulphate, SO4 1:5 soil:water	mg/kg	27	20	23	27
Resistivity in soil*	ohm m	290	610	410	310

Texture and Salinity*					
Our Reference		300587-33	300587-40	300587-51	300587-58
Your Reference	UNITS	BH1	BH1	BH3	BH3
Depth		0.5-0.7	4.5-4.7	2.4-2.5	6.3-6.5
Date Sampled		12/07/2022	12/07/2022	12/07/2022	12/07/2022
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022
Date analysed	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022
Electrical Conductivity 1:5 soil:water	µS/cm	120	34	16	24
Texture Value	-	7.0	7.0	7.0	7.0
Texture	-	MEDIUM CLAY	MEDIUM CLAY	MEDIUM CLAY	MEDIUM CLAY
ECe	dS/m	<2	<2	<2	<2
Class	-	NON SALINE	NON SALINE	NON SALINE	NON SALINE

sPOCAS field test						
Our Reference		300587-1	300587-5	300587-6	300587-11	300587-34
Your Reference	UNITS	BH1	BH3	BH3	BH5	BH1
Depth		0-0.1	0.4-0.5	0.8-0.95	0.5-0.95	0.8-1.0
Date Sampled		12/07/2022	12/07/2022	12/07/2022	13/07/2022	12/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	18/07/2022	18/07/2022	18/07/2022	18/07/2022	18/07/2022
Date analysed	-	18/07/2022	18/07/2022	18/07/2022	18/07/2022	18/07/2022
pH_F (field pH test)	pH Units	8.3	5.8	5.4	4.6	5.0
pH_{FOX} (field peroxide test)	pH Units	7.5	4.7	4.2	3.8	6.4
Reaction Rate*	-	High reaction	Low reaction	Low reaction	Low reaction	Low reaction

sPOCAS field test						
Our Reference		300587-35	300587-37	300587-40	300587-41	300587-50
Your Reference	UNITS	BH1	BH1	BH1	BH1	BH3
Depth		1.3-1.5	2.8-3.0	4.5-4.7	5.4-5.6	1.9-2.0
Date Sampled		12/07/2022	12/07/2022	12/07/2022	12/07/2022	12/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	18/07/2022	18/07/2022	18/07/2022	18/07/2022	18/07/2022
Date analysed	-	18/07/2022	18/07/2022	18/07/2022	18/07/2022	18/07/2022
pH_F (field pH test)	pH Units	4.3	4.7	5.3	5.1	5.0
pH_{FOX} (field peroxide test)	pH Units	3.6	3.9	4.2	4.2	3.9
Reaction Rate*	-	Low reaction	Low reaction	Low reaction	Low reaction	Low reaction

sPOCAS field test						
Our Reference		300587-53	300587-54	300587-58	300587-68	300587-69
Your Reference	UNITS	BH3	BH3	BH3	BH5	BH5
Depth		3.4-3.5	3.9-4.0	6.3-6.5	1.3-1.5	1.8-2.0
Date Sampled		12/07/2022	12/07/2022	12/07/2022	13/07/2022	13/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	18/07/2022	18/07/2022	18/07/2022	18/07/2022	18/07/2022
Date analysed	-	18/07/2022	18/07/2022	18/07/2022	18/07/2022	18/07/2022
pH_F (field pH test)	pH Units	5.3	5.3	5.4	4.7	5.1
pH_{FOX} (field peroxide test)	pH Units	4.1	3.9	4.2	3.5	3.9
Reaction Rate*	-	Low reaction	Low reaction	Low reaction	Low reaction	Low reaction

sPOCAS field test			
Our Reference		300587-71	300587-72
Your Reference	UNITS	BH5	BH5
Depth		2.8-3.0	3.3-3.5
Date Sampled		13/07/2022	13/07/2022
Type of sample		Soil	Soil
Date prepared	-	18/07/2022	18/07/2022
Date analysed	-	18/07/2022	18/07/2022
pH_F (field pH test)	pH Units	5.4	5.3
pH_{FOX} (field peroxide test)	pH Units	3.3	3.9
Reaction Rate*	-	Low reaction	Low reaction

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-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.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell at 25oC in accordance with APHA 22nd ED 2510 and Rayment & Lyons. Resistivity is calculated from Conductivity (non NATA). Resistivity (calculated) may not correlate with results otherwise obtained using Resistivity-Current method, depending on the nature of the soil being analysed.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-063	pH- measured using pH meter and electrode. Soil is oxidised with Hydrogen Peroxide or extracted with water. Based on section H, Acid Sulfate Soils Laboratory Methods Guidelines, Version 2.1 - June 2004. 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.

Method ID	Methodology Summary
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Waters samples are filtered on receipt prior to analysis. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
INORG-123	Determined using a "Texture by Feel" method.
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.
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	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, 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, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.

Method ID	Methodology Summary
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.
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 5.3 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-1	300587-16
Date prepared	-			19/07/2022	[NT]	[NT]	[NT]	[NT]	19/07/2022	19/07/2022
Date analysed	-			19/07/2022	[NT]	[NT]	[NT]	[NT]	19/07/2022	19/07/2022
Perfluorobutanesulfonic acid	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	106	111
Perfluoropentanesulfonic acid	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	95	97
Perfluorohexanesulfonic acid - PFHxS	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	111	121
Perfluoroheptanesulfonic acid	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	100	103
Perfluorooctanesulfonic acid PFOS	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	106	100
Perfluorodecanesulfonic acid	µg/kg	0.2	Org-029	<0.2	[NT]	[NT]	[NT]	[NT]	101	112
Perfluorobutanoic acid	µg/kg	0.2	Org-029	<0.2	[NT]	[NT]	[NT]	[NT]	111	113
Perfluoropentanoic acid	µg/kg	0.2	Org-029	<0.2	[NT]	[NT]	[NT]	[NT]	111	111
Perfluorohexanoic acid	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	110	105
Perfluoroheptanoic acid	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	82	83
Perfluorooctanoic acid PFOA	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	109	107
Perfluorononanoic acid	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	78	77
Perfluorodecanoic acid	µg/kg	0.5	Org-029	<0.5	[NT]	[NT]	[NT]	[NT]	136	131
Perfluoroundecanoic acid	µg/kg	0.5	Org-029	<0.5	[NT]	[NT]	[NT]	[NT]	103	109
Perfluorododecanoic acid	µg/kg	0.5	Org-029	<0.5	[NT]	[NT]	[NT]	[NT]	105	109
Perfluorotridecanoic acid	µg/kg	0.5	Org-029	<0.5	[NT]	[NT]	[NT]	[NT]	114	112
Perfluorotetradecanoic acid	µg/kg	5	Org-029	<5	[NT]	[NT]	[NT]	[NT]	125	126
4:2 FTS	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	111	110
6:2 FTS	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	91	91
8:2 FTS	µg/kg	0.2	Org-029	<0.2	[NT]	[NT]	[NT]	[NT]	78	84
10:2 FTS	µg/kg	0.2	Org-029	<0.2	[NT]	[NT]	[NT]	[NT]	80	93
Perfluorooctane sulfonamide	µg/kg	1	Org-029	<1	[NT]	[NT]	[NT]	[NT]	94	97
N-Methyl perfluorooctane sulfonamide	µg/kg	1	Org-029	<1	[NT]	[NT]	[NT]	[NT]	107	109
N-Ethyl perfluorooctanesulfon amide	µg/kg	1	Org-029	<1	[NT]	[NT]	[NT]	[NT]	116	113
N-Me perfluorooctanesulfonamid oethanol	µg/kg	1	Org-029	<1	[NT]	[NT]	[NT]	[NT]	63	69
N-Et perfluorooctanesulfonamid oethanol	µg/kg	5	Org-029	<5	[NT]	[NT]	[NT]	[NT]	130	131
MePerfluorooctanesulf- amid oacetic acid	µg/kg	0.2	Org-029	<0.2	[NT]	[NT]	[NT]	[NT]	106	110
EtPerfluorooctanesulf amid oacetic acid	µg/kg	0.2	Org-029	<0.2	[NT]	[NT]	[NT]	[NT]	103	111
Surrogate $^{13}C_8$ *PFOS*	%		Org-029	96	[NT]	[NT]	[NT]	[NT]	96	94
Surrogate $^{13}C_2$ *PFOA*	%		Org-029	96	[NT]	[NT]	[NT]	[NT]	100	97

QUALITY CONTROL: PFAS in Soils Extended					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	300587-16
Extracted ISTD $^{13}C_3$ *PFBS*	%		Org-029	98	[NT]	[NT]	[NT]	[NT]	96	98
Extracted ISTD $^{18}O_2$ *PFHxS*	%		Org-029	108	[NT]	[NT]	[NT]	[NT]	103	124
Extracted ISTD $^{13}C_4$ *PFOS*	%		Org-029	106	[NT]	[NT]	[NT]	[NT]	101	117
Extracted ISTD $^{13}C_4$ *PFBA*	%		Org-029	102	[NT]	[NT]	[NT]	[NT]	99	94
Extracted ISTD $^{13}C_3$ *PFPeA*	%		Org-029	98	[NT]	[NT]	[NT]	[NT]	94	100
Extracted ISTD $^{13}C_2$ *PFHxA*	%		Org-029	105	[NT]	[NT]	[NT]	[NT]	101	108
Extracted ISTD $^{13}C_4$ *PFHpA*	%		Org-029	105	[NT]	[NT]	[NT]	[NT]	111	133
Extracted ISTD $^{13}C_4$ *PFOA*	%		Org-029	101	[NT]	[NT]	[NT]	[NT]	100	135
Extracted ISTD $^{13}C_5$ *PFNA*	%		Org-029	109	[NT]	[NT]	[NT]	[NT]	102	133
Extracted ISTD $^{13}C_2$ *PFDA*	%		Org-029	103	[NT]	[NT]	[NT]	[NT]	104	111
Extracted ISTD $^{13}C_2$ *PFUnDA*	%		Org-029	106	[NT]	[NT]	[NT]	[NT]	110	111
Extracted ISTD $^{13}C_2$ *PFDoDA*	%		Org-029	98	[NT]	[NT]	[NT]	[NT]	103	137
Extracted ISTD $^{13}C_2$ *PFTeDA*	%		Org-029	114	[NT]	[NT]	[NT]	[NT]	116	108
Extracted ISTD $^{13}C_2$ *4:2FTS*	%		Org-029	99	[NT]	[NT]	[NT]	[NT]	95	100
Extracted ISTD $^{13}C_2$ *6:2FTS*	%		Org-029	101	[NT]	[NT]	[NT]	[NT]	99	157
Extracted ISTD $^{13}C_2$ *8:2FTS*	%		Org-029	112	[NT]	[NT]	[NT]	[NT]	112	#
Extracted ISTD $^{13}C_8$ *FOSA*	%		Org-029	104	[NT]	[NT]	[NT]	[NT]	101	131
Extracted ISTD d_3 *N MeFOSA*	%		Org-029	110	[NT]	[NT]	[NT]	[NT]	109	113
Extracted ISTD d_5 *N EtFOSA*	%		Org-029	112	[NT]	[NT]	[NT]	[NT]	107	137
Extracted ISTD d_7 *N MeFOSE*	%		Org-029	116	[NT]	[NT]	[NT]	[NT]	111	148

QUALITY CONTROL: PFAS in Soils Extended					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	300587-16
Extracted ISTD d_9 *N EtFOSE*	%		Org-029	110	[NT]	[NT]	[NT]	[NT]	101	119
Extracted ISTD d_3 *N MeFOSAA*	%		Org-029	103	[NT]	[NT]	[NT]	[NT]	101	134
Extracted ISTD d_5 *N EtFOSAA*	%		Org-029	106	[NT]	[NT]	[NT]	[NT]	98	135

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	[NT]
Date extracted	-			19/07/2022	1	19/07/2022	19/07/2022		19/07/2022	[NT]
Date analysed	-			20/07/2022	1	20/07/2022	20/07/2022		20/07/2022	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	<25	1	<25	<25	0	94	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	1	<25	<25	0	94	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	1	<0.2	<0.2	0	101	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	1	<0.5	<0.5	0	93	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	94	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	1	<2	<2	0	91	[NT]
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	95	[NT]
Naphthalene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	94	1	91	84	8	98	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	[NT]
Date extracted	-			19/07/2022	1	18/07/2022	18/07/2022		19/07/2022	[NT]
Date analysed	-			19/07/2022	1	19/07/2022	19/07/2022		19/07/2022	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	1	<50	<50	0	112	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	1	<100	<100	0	107	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	1	<100	<100	0	71	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	1	<50	<50	0	112	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	1	<100	<100	0	107	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	1	<100	<100	0	71	[NT]
Surrogate o-Terphenyl	%		Org-020	81	1	86	82	5	84	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	[NT]
Date extracted	-			20/07/2022	1	19/07/2022	19/07/2022		19/07/2022	[NT]
Date analysed	-			20/07/2022	1	19/07/2022	19/07/2022		19/07/2022	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	88	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	85	[NT]
Fluorene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	88	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	96	[NT]
Anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	1	0.2	0.1	67	92	[NT]
Pyrene	mg/kg	0.1	Org-022/025	<0.1	1	0.2	0.1	67	99	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	0.2	0.1	67	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	1	0.1	<0.1	0	81	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	1	0.7	0.5	33	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	1	0.3	0.2	40	118	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	1	0.2	0.2	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	1	0.2	0.1	67	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	87	1	85	88	3	89	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	[NT]
Date extracted	-			20/07/2022	1	19/07/2022	19/07/2022		19/07/2022	[NT]
Date analysed	-			20/07/2022	1	19/07/2022	19/07/2022		19/07/2022	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	90	[NT]
HCB	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	99	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	85	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	91	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	88	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	90	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	100	[NT]
Endrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	88	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	88	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	90	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	80	1	73	80	9	82	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	[NT]
Date extracted	-			20/07/2022	1	19/07/2022	19/07/2022		19/07/2022	[NT]
Date analysed	-			20/07/2022	1	19/07/2022	19/07/2022		19/07/2022	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	123	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	85	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	99	[NT]
Malathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	116	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	100	[NT]
Parathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	74	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	104	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	80	1	73	80	9	82	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	[NT]
Date extracted	-			20/07/2022	1	19/07/2022	19/07/2022		19/07/2022	[NT]
Date analysed	-			20/07/2022	1	19/07/2022	19/07/2022		19/07/2022	[NT]
Aroclor 1016	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	127	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	80	1	73	80	9	82	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	[NT]
Date prepared	-			19/07/2022	1	19/07/2022	19/07/2022		19/07/2022	[NT]
Date analysed	-			20/07/2022	1	20/07/2022	20/07/2022		20/07/2022	[NT]
Arsenic	mg/kg	4	Metals-020	<4	1	<4	6	40	92	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	94	[NT]
Chromium	mg/kg	1	Metals-020	<1	1	26	20	26	95	[NT]
Copper	mg/kg	1	Metals-020	<1	1	26	25	4	93	[NT]
Lead	mg/kg	1	Metals-020	<1	1	41	27	41	97	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	91	[NT]
Nickel	mg/kg	1	Metals-020	<1	1	9	10	11	94	[NT]
Zinc	mg/kg	1	Metals-020	<1	1	61	52	16	98	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			22/07/2022	33	22/07/2022	22/07/2022		22/07/2022	[NT]
Date analysed	-			22/07/2022	33	22/07/2022	22/07/2022		22/07/2022	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	33	4.4	4.5	2	99	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Chloride, Cl 1:5 soil:water	mg/kg	10	Inorg-081	<10	33	<10	<10	0	101	[NT]
Sulphate, SO4 1:5 soil:water	mg/kg	10	Inorg-081	<10	33	180	220	20	94	[NT]
Resistivity in soil*	ohm m	1	Inorg-002	<1	33	81	85	5	[NT]	[NT]

QUALITY CONTROL: Texture and Salinity*					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			22/07/2022	[NT]	[NT]	[NT]	[NT]	22/07/2022	[NT]
Date analysed	-			22/07/2022	[NT]	[NT]	[NT]	[NT]	22/07/2022	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]

QUALITY CONTROL: sPOCAS field test						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			18/07/2022	[NT]	[NT]	[NT]	[NT]	18/07/2022	[NT]
Date analysed	-			18/07/2022	[NT]	[NT]	[NT]	[NT]	18/07/2022	[NT]
pH_F (field pH test)	pH Units		Inorg-063	[NT]	[NT]	[NT]	[NT]	[NT]	98	[NT]
pH_{FOX} (field peroxide test)	pH Units		Inorg-063	[NT]	[NT]	[NT]	[NT]	[NT]	101	[NT]

Result Definitions

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

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-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.

Factual description of asbestos identified in the soil samples: NEPM
Sample 300587-1; Chrysotile asbestos identified in 0.9902g of fibre cement material >7mm

Acid Extractable Metals in Soil: The laboratory RPD acceptance criteria has been exceeded for 300587-1 for Pb. Therefore a triplicate result has been issued as laboratory sample number 300587-73.

Envirolab Services Pty Ltd
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SAMPLE RECEIPT ADVICE

Client Details

Client	JK Environments
Attention	Vittal Boggaram

Sample Login Details

Your reference	E35073B, Parramatta East
Envirolab Reference	300587
Date Sample Received	15/07/2022
Date Instructions Received	15/07/2022
Date Results Expected to be Reported	22/07/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	71 Soil, 1 Material
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	14
Cooling Method	Ice
Sampling Date Provided	YES

Comments

No NEPM bags received for samples

1,10,7,13,16,19, 22, 29

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	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 - materials	Misc Inorg - Soil	Texture and Salinity*	sPOCAS field test	On Hold
BH1 -0-0.1		✓	✓	✓	✓	✓	✓	✓	✓				✓	
BH2-0.1-0.4		✓	✓	✓	✓	✓	✓	✓	✓					
BH2-0.5-0.7														✓
BH3-0.04-0.1		✓	✓	✓	✓	✓	✓	✓	✓					
BH3-0.4-0.5											✓		✓	
BH3-0.8-0.95													✓	
BH4-0.04-0.3		✓	✓	✓	✓	✓	✓	✓						
BH4-0.5-0.95														✓
BH4-1.3-1.5														✓
BH5-0.04-0.3		✓	✓	✓	✓	✓	✓	✓						
BH5-0.5-0.95											✓		✓	
BH5-1.5-1.7											✓			
BH101-0-0.1		✓	✓	✓	✓	✓	✓	✓						
BH101-0.1-0.3														✓
BH101-0.4-0.5														✓
BH102-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓						
BH102-0.1-0.3														✓
BH102-0.4-0.6														✓
BH103-0-0.1		✓	✓	✓	✓	✓	✓	✓						
BH103-0.1-0.3														✓
BH103-0.4-0.6														✓
BH104-0-0.2	✓	✓	✓	✓	✓	✓	✓	✓						
BH104-0.4-0.6														✓
BH112-0-0.1		✓	✓	✓	✓	✓	✓	✓	✓					
BH112-0.1-0.4														✓
BH112 -0.5-0.														✓
SDUP1		✓	✓	✓	✓	✓	✓	✓						
SDUP2														✓
SDUP3	✓	✓	✓	✓	✓	✓	✓	✓						
TS		✓												
TB	✓	✓	✓	✓				✓						
FCF1-Surface										✓				

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
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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 - materials	Misc Inorg - Soil	Texture and Salinity*	sPOCAS field test	On Hold
BH1-0.5-0.7											✓	✓		
BH1-0.8-1.0													✓	
BH1-1.3-1.5													✓	
BH1-1.8-2.0											✓			
BH1-2.8-3.0													✓	
BH1-3.3-3.5														✓
BH1-3.8-4.0														✓
BH1-4.5-4.7											✓	✓	✓	
BH1-5.4-5.6													✓	
BH2-0.1-0.4														✓
BH2-1.4-1.5														✓
BH2-1.7-1.95														✓
BH2-2.4-2.5														✓
BH2-2.8-3.0														✓
BH2-3.4-3.5														✓
BH2-3.9-4.0														✓
BH3 -1.4-1.														✓
BH3-1.9-2.0													✓	
BH3-2.4-2.5											✓	✓		
BH3-2.9-3.0														✓
BH3 -3.4-3.													✓	
BH3-3.9-4.0													✓	
BH3-4.3-4.5														✓
BH3-4.8-5.0														✓
BH3-5.3-5.5														✓
BH3-6.3-6.5											✓	✓	✓	
BH4 -1.9-2.														✓
BH4-2.3-2.5														✓
BH4-2.8-3.0														✓
BH4-3.3-3.5														✓
BH4-3.8-4.0														✓
BH4-4.3-4.5														✓

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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 - materials	Misc Inorg - Soil	Texture and Salinity*	sPOCAS field test	On Hold
BH4-5.3-5.5														✓
BH4-5.8-6.0														✓
BH4-6.3-6.5														✓
BH5 -1.3-1.													✓	
BH5 -1.8-2.													✓	
BH5-2.3-2.5														✓
BH5-2.8-3.0													✓	
BH5-3.3-3.5											✓		✓	

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.

COC 15/7 @ 1500

300587

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: E35073B Date Results Required: STANDARD Page: 1 of 6	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:	Parramatta East						Sample Preserved in Esky on Ice										
Sampler:	HW/NF						Tests Required										
Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 2	Combo 3	Combo 6	Asbestos 500mL	PFAS - Routine	BTEX	Asbestos				
12/07/2022	1	BH1	0-0.1	G, A	0	F: Sandy gravel			X	X							
12/07/2022	2	BH2	0.1-0.4	G, A	0	F: Gravelly sand			X	X							
12/07/2022	3	BH2	0.5-0.7	G, A	0	Silty clay											
12/07/2022	4	BH3	0.04-0.1	G, A	0	F: Sandy gravel			X	X							
12/07/2022	5	BH3	0.4-0.5	G, A	0	Silty clay											
12/07/2022	6	BH3	0.8-0.95	G, A	0	Silty clay											
13/07/2022	7	BH4	0.04-0.3	G, A	0	F: Gravelly sand			X	X							
13/07/2022	8	BH4	0.5-0.95	G, A	0	Silty clay											
13/07/2022	9	BH4	1.3-1.5	G, A	0	Silty clay											
13/07/2022	10	BH5	0.04-0.3	G, A	0	F: Gravelly sand			X	X							
13/07/2022	11	BH5	0.5-0.95	G, A	0	Silty clay											
13/07/2022	12	BH5	1.5-1.7	G, A	0	Silty clay											
13/07/2022	13	BH101	0-0.1	G, A	0	F: Silty clay			X	X							
13/07/2022	14	BH101	0.1-0.3	G, A	0	F: Silty clay											
13/07/2022	15	BH101	0.4-0.5	G, A	0	Silty clay											
13/07/2022	16	BH102	0-0.1	G, A, PFAS	0	F: Sandy clay			X	X	X						
13/07/2022	17	BH102	0.1-0.3	G, A, PFAS	0	F: Sandy clay											
13/07/2022	18	BH102	0.4-0.6	G, A, PFAS	0	Silty clay											
13/07/2022	19	BH103	0-0.1	G, A	0	F: Sandy clay			X	X							
13/07/2022	20	BH103	0.1-0.3	G, A	0	F: Sandy clay											
13/07/2022	21	BH103	0.4-0.6	G, A	0	Silty clay											
13/07/2022	22	BH104	0-0.2	G, A, PFAS	0	F: Sandy clay			X	X	X						
13/07/2022	23	BH104	0.4-0.6	G, A, PFAS	0	Silty clay											
13/07/2022	24	BH112	0-0.1	G, A	0	F: Clayey sand			X	X							
13/07/2022	25	BH112	0.1-0.4	G, A	0	F: Silty clay											

Remarks (comments/detection limits required):	Sample Containers: G - 250mg Glass Jar A - Ziplock Asbestos Bag P - Plastic Bag			
Relinquished By: VB	Date: 15-07-2022	Time: 2pm	Received By:	Date:

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD	JKE Job Number: E35073B	JKEnvironments
12 ASHLEY STREET		REAR OF 115 WICKS ROAD
CHATSWOOD NSW 2067		MACQUARIE PARK, NSW 2113
P: (02) 99106200	Date Results Required: STANDARD	P: 02-9888 5000 F: 02-9888 5001
F: (02) 99106201		Attention: Vittal Boggaram
Attention: Aileen	Page: 2 of 6	vboggaram@jkenvironments.com.au

Location:	Parramatta	Sample Preserved in Esky on Ice
Sampler:	HW/NF	Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 2	Combo 3	Combo 6	Asbestos 500mL	PFAS - Routine	BTEX	Asbestos					
13/07/2022	26	BH112	0.5-0.6	G, A	0	Silty clay												
12/07/2022	27	SDUP1	-	G	-	Duplicate			X									
13/07/2022	28	SDUP2	-	G	-	Duplicate			X		Please send to VIC							
13/07/2022	29	SDUP3	-	G, A, PFAS	-	Duplicate			X	X	X							
13/07/2022	30	TS	-	G	-	Spike						X						
13/07/2022	31	TB	-	G, PFAS	-	Blank		X			X							
13/07/2022	32	FCF1-Surface		A	-	FCF Frag							X					

Remarks (comments/detection limits required):	Sample Containers: G - 250mg Glass Jar A - Ziplock Asbestos Bag P - Plastic Bag			
Relinquished By: VB	Date: 15-07-2022	Time: 2pm	Received By:	Date:

SAMPLE AND CHAIN OF CUSTODY FORM

TO:	JKE Job Number: E35073B	FROM: JKEnvironments
ENVIROLAB SERVICES PTY LTD 12 ASHLEY STREET CHATSWOOD NSW 2067 P: (02) 99106200 F: (02) 99106201	Date Results Required: STANDARD	REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001
Attention: Aileen	Page: 3 of 6	Attention: Vittal Boggaram vboggaram@jkenvironments.com.au

Location:	Parramatta					Sample Preserved in Esky on Ice											
Sampler:	HW/NF					Tests Required											
Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	Sample Description	pH	EC	Resistivity	Sulphate	Chloride	ECe (texture)						
12/07/2022	1	BH1	0-0.1	P	F: Sandy gravel												
12/07/2022	33	BH1	0.5-0.7	P	Silty clay	X	X	X	X	X	X						
12/07/2022	34	BH1	0.8-1.0	P	Silty clay												
12/07/2022	35	BH1	1.3-1.5	P	Silty clay												
12/07/2022	36	BH1	1.8-2.0	P	XW Sandstone	X	X	X	X	X							
12/07/2022	37	BH1	2.8-3.0	P	Sandstone												
12/07/2022	38	BH1	3.3-3.5	P	Sandstone												
12/07/2022	39	BH1	3.8-4.0	P	Sandstone												
12/07/2022	40	BH1	4.5-4.7	P	Sandstone and Siltstone	X	X	X	X	X	X						
12/07/2022	41	BH1	5.4-5.6	P	Sandstone												
12/07/2022	42	BH2	0.1-0.4	P	F: Gravelly sand												
12/07/2022	3	BH2	0.5-0.7	P	Silty clay												
12/07/2022	43	BH2	1.4-1.5	P	Silty clay												
12/07/2022	44	BH2	1.7-1.95	P	XW Sandstone												
12/07/2022	45	BH2	2.4-2.5	P	XW Sandstone												
12/07/2022	46	BH2	2.8-3.0	P	XW Sandstone												
12/07/2022	47	BH2	3.4-3.5	P	XW Sandstone												
12/07/2022	48	BH2	3.9-4.0	P	XW Sandstone												
12/07/2022	4	BH3	0.04-0.1	P	F: Sandy gravel												
12/07/2022	5	BH3	0.4-0.5	P	Silty clay	X	X	X	X	X							
12/07/2022	6	BH3	0.8-0.95	P	Silty clay												
12/07/2022	49	BH3	1.4-1.5	P	Silty clay												
12/07/2022	50	BH3	1.9-2.0	P	XW Sandstone												
12/07/2022	51	BH3	2.4-2.5	P	Sandstone	X	X	X	X	X	X						
12/07/2022	52	BH3	2.9-3.0	P	Sandstone												

Remarks (comments/detection limits required):	Sample Containers: G - 250mg Glass Jar A - Ziplock Asbestos Bag P - Plastic Bag	
Relinquished By: VB	Date: 15-07-2022	Time: 2pm
Received By:	Date:	

SAMPLE AND CHAIN OF CUSTODY FORM

TO:	JKE Job Number: E35073B	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: 4 of 6	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:	Parramatta	Sample Preserved in Esky on Ice
Sampler:	HW/NF	Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	Sample Description	pH	EC	Resistivity	Sulphate	Chloride	ECe (texture)						
12/07/2022	53	BH3	3.4-3.5	P	Sandstone												
12/07/2022	54	BH3	3.9-4.0	P	Sandstone												
12/07/2022	55	BH3	4.3-4.5	P	Sandstone												
12/07/2022	56	BH3	4.8-5.0	P	Sandstone												
12/07/2022	57	BH3	5.3-5.5	P	Sandstone												
12/07/2022	58	BH3	6.3-6.5	P	Sandstone	X	X	X	X	X	X						
13/07/2022	7	BH4	0.04-0.3	P	F: Gravelly sand												
13/07/2022	8	BH4	0.5-0.95	P	Silty clay												
13/07/2022	9	BH4	1.3-1.5	P	Silty clay												
13/07/2022	59	BH4	1.9-2.0	P	XW Sandstone												
13/07/2022	60	BH4	2.3-2.5	P	XW Sandstone												
13/07/2022	61	BH4	2.8-3.0	P	Sandstone												
13/07/2022	62	BH4	3.3-3.5	P	Sandstone												
13/07/2022	63	BH4	3.8-4.0	P	Sandstone												
13/07/2022	64	BH4	4.3-4.5	P	Sandstone												
13/07/2022	65	BH4	5.3-5.5	P	Sandstone												
13/07/2022	66	BH4	5.8-6.0	P	Sandstone												
13/07/2022	67	BH4	6.3-6.5	P	Sandstone												
13/07/2022	10	BH5	0.04-0.3	P	F: Gravelly sand												
13/07/2022	11	BH5	0.5-0.95	P	Silty clay	X	X	X	X	X							
13/07/2022	68	BH5	1.3-1.5	P	Silty clay												
13/07/2022	12	BH5	1.5-1.7	P	XW Sandstone	X	X	X	X	X							
13/07/2022	69	BH5	1.8-2.0	P	XW Sandstone												
13/07/2022	70	BH5	2.3-2.5	P	XW Sandstone												
13/07/2022	71	BH5	2.8-3.0	P	XW Sandstone												
13/07/2022	72	BH5	3.3-3.5	P	XW Sandstone	X	X	X	X	X							

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

Relinquished By: VB	Date: 15-07-2022	Time: 2pm	Received By:	Date:

SAMPLE AND CHAIN OF CUSTODY FORM

TO:	JKE Job Number: E35073B	FROM: JKEnvironments
ENVIROLAB SERVICES PTY LTD 12 ASHLEY STREET CHATSWOOD NSW 2067 P: (02) 99106200 F: (02) 99106201	Date Results Required: STANDARD	REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001
Attention: Aileen	Page: 5 of 6	Attention: Vittal Boggaram vboggaram@jkenvironments.com.au

Location:	Parramatta	Sample Preserved in Esky on Ice
Sampler:	HW/NF	Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	Sample Description	SCr extended	pH field test (pHF apHFOX)										
12/07/2022	1	BH1	0-0.1	P	F: Sandy gravel		X										
12/07/2022	29	BH1	0.8-1.0	P	Silty clay		X										
12/07/2022	35	BH1	1.3-1.5	P	Silty clay		X										
12/07/2022	36	BH1	1.8-2.0	P	XW Sandstone												
12/07/2022	37	BH1	2.8-3.0	P	Sandstone		X										
12/07/2022	38	BH1	3.3-3.5	P	Sandstone												
12/07/2022	39	BH1	3.8-4.0	P	Sandstone												
12/07/2022	40	BH1	4.5-4.7	P	Sandstone and Siltstone		X										
12/07/2022	41	BH1	5.4-5.6	P	Sandstone		X										
12/07/2022	42	BH2	0.1-0.4	P	F: Gravelly sand												
12/07/2022	3	BH2	0.5-0.7	P	Silty clay												
12/07/2022	43	BH2	1.4-1.5	P	Silty clay												
12/07/2022	44	BH2	1.7-1.95	P	XW Sandstone												
12/07/2022	45	BH2	2.4-2.5	P	XW Sandstone												
12/07/2022	46	BH2	2.8-3.0	P	XW Sandstone												
12/07/2022	47	BH2	3.4-3.5	P	XW Sandstone												
12/07/2022	48	BH2	3.9-4.0	P	XW Sandstone												
12/07/2022	5	BH3	0.4-0.5	P	F: Sandy gravel		X										
12/07/2022	6	BH3	0.8-0.95	P	Silty clay		X										
12/07/2022	49	BH3	1.4-1.5	P	Silty clay												
12/07/2022	50	BH3	1.9-2.0	P	Silty clay		X										
12/07/2022	51	BH3	2.4-2.5	P	XW Sandstone												
12/07/2022	52	BH3	2.9-3.0	P	Sandstone												
12/07/2022	53	BH3	3.4-3.5	P	Sandstone		X										
12/07/2022	54	BH3	3.9-4.0	P	Sandstone		X										

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

Relinquished By: VB	Date: 15-07-2022	Time: 2pm	Received By:	Date:

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: E35073B Date Results Required: STANDARD Page: 6 of 6	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:	Parramatta	Sample Preserved in Esky on Ice
Sampler:	HW/NF	Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	Sample Description	SCr extended	pH field test (pHF apHFOX)										
12/07/2022	55	BH3	4.3-4.5	P	Sandstone												
12/07/2022	56	BH3	4.8-5.0	P	Sandstone												
12/07/2022	57	BH3	5.3-5.5	P	Sandstone												
12/07/2022	58	BH3	6.3-6.5	P	Sandstone		X										
13/07/2022	7	BH4	0.04-0.3	P	F: Gravelly sand												
13/07/2022	8	BH4	0.5-0.95	P	Silty clay												
13/07/2022	9	BH4	1.3-1.5	P	Silty clay												
13/07/2022	59	BH4	1.9-2.0	P	XW Sandstone												
13/07/2022	60	BH4	2.3-2.5	P	XW Sandstone												
13/07/2022	61	BH4	2.8-3.0	P	Sandstone												
13/07/2022	62	BH	3.3-3.5	P	Sandstone												
13/07/2022	63	BH4	3.8-4.0	P	Sandstone												
13/07/2022	64	BH4	4.3-4.5	P	Sandstone												
13/07/2022	65	BH4	5.3-5.5	P	Sandstone												
13/07/2022	66	BH4	5.8-6.0	P	Sandstone												
13/07/2022	67	BH4	6.3-6.5	P	Sandstone												
13/07/2022	10	BH5	0.04-0.3	P	F: Gravelly sand												
13/07/2022	11	BH5	0.5-0.95	P	Silty clay		X										
13/07/2022	68	BH5	1.3-1.5	P	Silty clay		X										
13/07/2022	12	BH5	1.5-1.7	P	XW Sandstone												
13/07/2022	69	BH5	1.8-2.0	P	XW Sandstone		X										
13/07/2022	70	BH5	2.3-2.5	P	XW Sandstone												
13/07/2022	71	BH5	2.8-3.0	P	XW Sandstone		X										
13/07/2022	72	BH5	3.3-3.5	P	XW Sandstone		X										
	73	~~SDUP103~~ extra		P													

Remarks (comments/detection limits required):	Sample Containers: G - 250mg Glass Jar A - Ziplock Asbestos Bag P - Plastic Bag			
Relinquished By: VB	Date: 15-07-2022	Time: 2pm	Received By:	Date:

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

CERTIFICATE OF ANALYSIS 300587-A

Client Details

Client	JK Environments
Attention	Alistair Mitchell
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E35073B, Parramatta East**
Number of Samples	additional analysis
Date samples received	15/07/2022
Date completed instructions received	28/07/2022

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

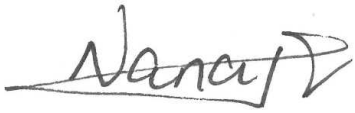
Date results requested by	04/08/2022
Date of Issue	04/08/2022

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Results Approved By
Priya Samarawickrama, Senior Chemist

Authorised By



Nancy Zhang, Laboratory Manager

Chromium Suite			
Our Reference		300587-A-37	300587-A-71
Your Reference	UNITS	BH1	BH5
Depth		2.8-3.0	2.8-3.0
Date Sampled		12/07/2022	13/07/2022
Type of sample		Soil	Soil
Date prepared	-	04/08/2022	04/08/2022
Date analysed	-	04/08/2022	04/08/2022
pH $_{kcl}$	pH units	4.3	4.4
s-TAA pH 6.5	%w/w S	0.06	0.04
TAA pH 6.5	moles H^+ /t	38	26
Chromium Reducible Sulfur	%w/w	<0.005	<0.005
a-Chromium Reducible Sulfur	moles H^+ /t	<3	<3
S_{HCl}	%w/w S	0.009	0.005
S_{KCl}	%w/w S	0.006	<0.005
S_{NAS}	%w/w S	<0.005	0.005
ANC_{BT}	% $CaCO_3$	[NT]	[NT]
s-ANC_{BT}	%w/w S	[NT]	[NT]
s-Net Acidity	%w/w S	0.065	0.049
a-Net Acidity	moles H^+ /t	41	31
Liming rate	kg $CaCO_3$ /t	3	2
a-Net Acidity without ANCE	moles H^+ /t	41	31
Liming rate without ANCE	kg $CaCO_3$ /t	3.1	2.3
s-Net Acidity without ANCE	%w/w S	0.065	0.049

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. Based on National acid sulfate soils identification and laboratory methods manual June 2018. 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 results reported.

QUALITY CONTROL: Chromium Suite						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			04/08/2022	[NT]	[NT]	[NT]	[NT]	04/08/2022	[NT]
Date analysed	-			04/08/2022	[NT]	[NT]	[NT]	[NT]	04/08/2022	[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]	107	[NT]
Chromium Reducible Sulfur	%w/w	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	102	[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]	[NT]	[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]

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.

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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customerservice@envirolab.com.au
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SAMPLE RECEIPT ADVICE

Client Details

Client	JK Environments
Attention	Alistair Mitchell

Sample Login Details

Your reference	E35073B, Parramatta East
Envirolab Reference	300587-A
Date Sample Received	15/07/2022
Date Instructions Received	28/07/2022
Date Results Expected to be Reported	04/08/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	additional analysis
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	14
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	Chromium Suite	On Hold
BH1 -0-0.1		✓
BH2-0.1-0.4		✓
BH2-0.5-0.7		✓
BH3-0.04-0.1		✓
BH3-0.4-0.5		✓
BH3-0.8-0.95		✓
BH4-0.04-0.3		✓
BH4-0.5-0.95		✓
BH4-1.3-1.5		✓
BH5-0.04-0.3		✓
BH5-0.5-0.95		✓
BH5-1.5-1.7		✓
BH101-0-0.1		✓
BH101-0.1-0.3		✓
BH101-0.4-0.5		✓
BH102-0-0.1		✓
BH102-0.1-0.3		✓
BH102-0.4-0.6		✓
BH103-0-0.1		✓
BH103-0.1-0.3		✓
BH103-0.4-0.6		✓
BH104-0-0.2		✓
BH104-0.4-0.6		✓
BH112-0-0.1		✓
BH112-0.1-0.4		✓
BH112 -0.5-0.6		✓
SDUP1		✓
SDUP2		✓
SDUP3		✓
TS		✓
TB		✓
FCF1-Surface		✓

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Sample ID	Chromium Suite	On Hold
BH1-0.5-0.7		✓
BH1-0.8-1.0		✓
BH1-1.3-1.5		✓
BH1-1.8-2.0		✓
BH1-2.8-3.0	✓	
BH1-3.3-3.5		✓
BH1-3.8-4.0		✓
BH1-4.5-4.7		✓
BH1-5.4-5.6		✓
BH2-0.1-0.4		✓
BH2-1.4-1.5		✓
BH2-1.7-1.95		✓
BH2-2.4-2.5		✓
BH2-2.8-3.0		✓
BH2-3.4-3.5		✓
BH2-3.9-4.0		✓
BH3 -1.4-1.5		✓
BH3-1.9-2.0		✓
BH3-2.4-2.5		✓
BH3-2.9-3.0		✓
BH3 -3.4-3.5		✓
BH3-3.9-4.0		✓
BH3-4.3-4.5		✓
BH3-4.8-5.0		✓
BH3-5.3-5.5		✓
BH3-6.3-6.5		✓
BH4 -1.9-2.0		✓
BH4-2.3-2.5		✓
BH4-2.8-3.0		✓
BH4-3.3-3.5		✓
BH4-3.8-4.0		✓
BH4-4.3-4.5		✓

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Sample ID	Chromium Suite	On Hold
BH4-5.3-5.5		✓
BH4-5.8-6.0		✓
BH4-6.3-6.5		✓
BH5 -1.3-1.5		✓
BH5 -1.8-2.0		✓
BH5-2.3-2.5		✓
BH5-2.8-3.0	✓	
BH5-3.3-3.5		✓
BH1 - [TRIPLICATE]-0-0.1		✓

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

Additional Info

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

Ming To

Subject: FW: Results for Registration 300836-A E35073B, Paramatta

Ref: 300587-A
TAT: Standard
Due: 04/08/2022
MT

From: Alistair Mitchell <AMitchell@jkenvironments.com.au>
Sent: Thursday, 28 July 2022 3:48 PM
To: Greta Petzold <GPetzold@envirolab.com.au>
Cc: Vittal Boggaram <VBoggaram@jkenvironments.com.au>
Subject: RE: Results for Registration 300836-A E35073B, Paramatta

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 Greta,

I have noticed there are some samples labelled incorrectly within the 300836 report. Please see below:

- Samples 99 is labelled BH8 (0.7-0.9) in the report but should be labelled BH8 (1.7-2.0) based on the COC;
- Sample 100 is labelled BH8 (1.7-2.0) in the report but should be labelled BH8 (2.6-2.8) based on the COC; and
- Sample 101 is labelled BH8 (2.6-2.8) in the report but should be labelled BH8 (3.5-3.7) based on the COC.

Can get an amended report send out to reflect the correct labelling?

Can I also get additional Chromium Reducible Suite testing for the following samples:

- Sample 37 (300587) BH1 (2.8-3.0); 37
- Sample 71 (300587) BH5 (2.8-3.0); 71
- Sample 10 (300836) - BH7 (1.0-1.2); and
- Sample 12 (300836) - BH8 (0.7-0.9).

Thanks,

Regards
Alistair Mitchell
Environmental Scientist

T: +612 9888 5000
D: 0421 687 953
E: AMitchell@jkenvironments.com.au
www.jkenvironments.com.au

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

JKEnvironments

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From: Greta Petzold <GPetzold@envirolab.com.au>
Sent: Tuesday, 26 July 2022 3:46 PM
To: Alistair Mitchell <AMitchell@jkenvironments.com.au>
Subject: Results for Registration 300836-A E35073B, Paramatta

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CERTIFICATE OF ANALYSIS 300587-B

Client Details

Client	JK Environments
Attention	Alistair Mitchell
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E35073B, Parramatta East**
Number of Samples	additional analysis
Date samples received	15/07/2022
Date completed instructions received	29/07/2022

Analysis Details

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

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

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

Report Details

Date results requested by	05/08/2022
Date of Issue	05/08/2022

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Results Approved By
Josh Williams, Organics and LC Supervisor

Authorised By

Nancy Zhang, Laboratory Manager

PFAS in TCLP Extended			
Our Reference		300587-B-16	300587-B-22
Your Reference	UNITS	BH102	BH104
Depth		0-0.1	0-0.2
Date Sampled		13/07/2022	13/07/2022
Type of sample		Soil	Soil
Date prepared	-	05/08/2022	05/08/2022
Date analysed	-	05/08/2022	05/08/2022
pH of soil for fluid# determ.	pH units	8.1	8.0
pH of soil TCLP (after HCl)	pH units	1.6	1.6
Extraction fluid used		1	1
pH of final Leachate	pH units	4.9	4.9
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	0.02	0.03
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 aci	µg/L	<0.02	<0.02
EtPerfluorooctanesulf- amid oacetic acid	µg/L	<0.02	<0.02
Surrogate $^{13}C_8$ *PFOS*	%	101	112

PFAS in TCLP Extended			
Our Reference		300587-B-16	300587-B-22
Your Reference	UNITS	BH102	BH104
Depth		0-0.1	0-0.2
Date Sampled		13/07/2022	13/07/2022
Type of sample		Soil	Soil
Surrogate $^{13}C_2$ *PFOA*	%	101	101
Extracted ISTD $^{13}C_3$ *PFBS*	%	98	106
Extracted ISTD $^{18}O_2$ *PFHxS*	%	99	102
Extracted ISTD $^{13}C_4$ *PFOS*	%	102	104
Extracted ISTD $^{13}C_4$ *PFBA*	%	83	89
Extracted ISTD $^{13}C_3$ *PFPeA*	%	86	89
Extracted ISTD $^{13}C_2$ *PFHxA*	%	93	98
Extracted ISTD $^{13}C_4$ *PFHpA*	%	92	94
Extracted ISTD $^{13}C_4$ *PFOA*	%	93	99
Extracted ISTD $^{13}C_5$ *PFNA*	%	102	105
Extracted ISTD $^{13}C_2$ *PFDA*	%	104	109
Extracted ISTD $^{13}C_2$ *PFUnDA*	%	102	103
Extracted ISTD $^{13}C_2$ *PFDoDA*	%	107	111
Extracted ISTD $^{13}C_2$ *PFTeDA*	%	85	93
Extracted ISTD $^{13}C_2$ *4:2FTS*	%	52	61
Extracted ISTD $^{13}C_2$ *6:2FTS*	%	74	81
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	85	96
Extracted ISTD $^{13}C_8$ *FOSA*	%	113	118
Extracted ISTD d_3 *N MeFOSA*	%	103	109
Extracted ISTD d_5 *N EtFOSA*	%	101	108
Extracted ISTD d_7 *N MeFOSE*	%	106	109
Extracted ISTD d_9 *N EtFOSE*	%	101	108
Extracted ISTD d_3 *N MeFOSAA*	%	76	86
Extracted ISTD d_5 *N EtFOSAA*	%	80	84
Total Positive PFHxS & PFOS	µg/L	0.02	0.03
Total Positive PFOS & PFOA	µg/L	0.02	0.05
Total Positive PFAS	µg/L	0.02	0.05

Method ID	Methodology Summary
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using AS 4439 and USEPA 1311. Please note that the mass used may be scaled down from default based on sample mass available. Samples are stored at 2-6oC before and after leachate preparation.
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 5.3 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 TCLP Extended					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			05/08/2022	[NT]	[NT]	[NT]	[NT]	05/08/2022	[NT]
Date analysed	-			05/08/2022	[NT]	[NT]	[NT]	[NT]	05/08/2022	[NT]
Perfluorobutanesulfonic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	105	[NT]
Perfluoropentanesulfonic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	103	[NT]
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	108	[NT]
Perfluoroheptanesulfonic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	115	[NT]
Perfluorooctanesulfonic acid PFOS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	109	[NT]
Perfluorodecanesulfonic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	105	[NT]
Perfluorobutanoic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	104	[NT]
Perfluoropentanoic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	105	[NT]
Perfluorohexanoic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	102	[NT]
Perfluoroheptanoic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	104	[NT]
Perfluorooctanoic acid PFOA	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	107	[NT]
Perfluorononanoic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	98	[NT]
Perfluorodecanoic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	99	[NT]
Perfluoroundecanoic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	109	[NT]
Perfluorododecanoic acid	µg/L	0.05	Org-029	<0.05	[NT]	[NT]	[NT]	[NT]	106	[NT]
Perfluorotridecanoic acid	µg/L	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Perfluorotetradecanoic acid	µg/L	0.5	Org-029	<0.5	[NT]	[NT]	[NT]	[NT]	107	[NT]
4:2 FTS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	100	[NT]
6:2 FTS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	116	[NT]
8:2 FTS	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	114	[NT]
10:2 FTS	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	114	[NT]
Perfluorooctane sulfonamide	µg/L	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
N-Methyl perfluorooctane sulfonamide	µg/L	0.05	Org-029	<0.05	[NT]	[NT]	[NT]	[NT]	110	[NT]
N-Ethyl perfluorooctanesulfon amide	µg/L	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
N-Me perfluorooctanesulfonamid oethanol	µg/L	0.05	Org-029	<0.05	[NT]	[NT]	[NT]	[NT]	115	[NT]
N-Et perfluorooctanesulfonamid oethanol	µg/L	0.5	Org-029	<0.5	[NT]	[NT]	[NT]	[NT]	116	[NT]
MePerfluorooctanesulf- amid oacetic aci	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	111	[NT]
EtPerfluorooctanesulf- amid oacetic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	101	[NT]
Surrogate $^{13}C_8$ *PFOS*	%		Org-029	110	[NT]	[NT]	[NT]	[NT]	111	[NT]
Surrogate $^{13}C_2$ *PFOA*	%		Org-029	104	[NT]	[NT]	[NT]	[NT]	100	[NT]

QUALITY CONTROL: PFAS in TCLP Extended					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Extracted ISTD $^{13}C_3$ *PFBS*	%		Org-029	99	[NT]	[NT]	[NT]	[NT]	94	[NT]
Extracted ISTD $^{18}O_2$ *PFHxS*	%		Org-029	100	[NT]	[NT]	[NT]	[NT]	96	[NT]
Extracted ISTD $^{13}C_4$ *PFOS*	%		Org-029	100	[NT]	[NT]	[NT]	[NT]	98	[NT]
Extracted ISTD $^{13}C_4$ *PFBA*	%		Org-029	89	[NT]	[NT]	[NT]	[NT]	82	[NT]
Extracted ISTD $^{13}C_3$ *PFPeA*	%		Org-029	89	[NT]	[NT]	[NT]	[NT]	85	[NT]
Extracted ISTD $^{13}C_2$ *PFHxA*	%		Org-029	96	[NT]	[NT]	[NT]	[NT]	89	[NT]
Extracted ISTD $^{13}C_4$ *PFHpA*	%		Org-029	92	[NT]	[NT]	[NT]	[NT]	88	[NT]
Extracted ISTD $^{13}C_4$ *PFOA*	%		Org-029	93	[NT]	[NT]	[NT]	[NT]	92	[NT]
Extracted ISTD $^{13}C_5$ *PFNA*	%		Org-029	100	[NT]	[NT]	[NT]	[NT]	99	[NT]
Extracted ISTD $^{13}C_2$ *PFDA*	%		Org-029	107	[NT]	[NT]	[NT]	[NT]	106	[NT]
Extracted ISTD $^{13}C_2$ *PFUnDA*	%		Org-029	96	[NT]	[NT]	[NT]	[NT]	99	[NT]
Extracted ISTD $^{13}C_2$ *PFDoDA*	%		Org-029	103	[NT]	[NT]	[NT]	[NT]	102	[NT]
Extracted ISTD $^{13}C_2$ *PFTeDA*	%		Org-029	73	[NT]	[NT]	[NT]	[NT]	72	[NT]
Extracted ISTD $^{13}C_2$ *4:2FTS*	%		Org-029	57	[NT]	[NT]	[NT]	[NT]	52	[NT]
Extracted ISTD $^{13}C_2$ *6:2FTS*	%		Org-029	79	[NT]	[NT]	[NT]	[NT]	71	[NT]
Extracted ISTD $^{13}C_2$ *8:2FTS*	%		Org-029	97	[NT]	[NT]	[NT]	[NT]	90	[NT]
Extracted ISTD $^{13}C_8$ *FOSA*	%		Org-029	111	[NT]	[NT]	[NT]	[NT]	108	[NT]
Extracted ISTD d_3 *N MeFOSA*	%		Org-029	99	[NT]	[NT]	[NT]	[NT]	99	[NT]
Extracted ISTD d_5 *N EtFOSA*	%		Org-029	100	[NT]	[NT]	[NT]	[NT]	98	[NT]
Extracted ISTD d_7 *N MeFOSE*	%		Org-029	102	[NT]	[NT]	[NT]	[NT]	101	[NT]

QUALITY CONTROL: PFAS in TCLP Extended						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Extracted ISTD d_9 *N EtFOSE*	%		Org-029	100	[NT]	[NT]	[NT]	[NT]	98	[NT]
Extracted ISTD d_3 *N MeFOSAA*	%		Org-029	83	[NT]	[NT]	[NT]	[NT]	77	[NT]
Extracted ISTD d_5 *N EtFOSAA*	%		Org-029	82	[NT]	[NT]	[NT]	[NT]	78	[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.

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	Alistair Mitchell

Sample Login Details

Your reference	E35073B, Parramatta East
Envirolab Reference	300587-B
Date Sample Received	15/07/2022
Date Instructions Received	29/07/2022
Date Results Expected to be Reported	05/08/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	additional analysis
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	14
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	PFAS in TCLP Extended	On Hold
BH1 -0-0.1		✓
BH2-0.1-0.4		✓
BH2-0.5-0.7		✓
BH3-0.04-0.1		✓
BH3-0.4-0.5		✓
BH3-0.8-0.95		✓
BH4-0.04-0.3		✓
BH4-0.5-0.95		✓
BH4-1.3-1.5		✓
BH5-0.04-0.3		✓
BH5-0.5-0.95		✓
BH5-1.5-1.7		✓
BH101-0-0.1		✓
BH101-0.1-0.3		✓
BH101-0.4-0.5		✓
BH102-0-0.1	✓	
BH102-0.1-0.3		✓
BH102-0.4-0.6		✓
BH103-0-0.1		✓
BH103-0.1-0.3		✓
BH103-0.4-0.6		✓
BH104-0-0.2	✓	
BH104-0.4-0.6		✓
BH112-0-0.1		✓
BH112-0.1-0.4		✓
BH112 -0.5-0.6		✓
SDUP1		✓
SDUP2		✓
SDUP3		✓
TS		✓
TB		✓
FCF1-Surface		✓

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Sample ID	PFAS in TCLP Extended	On Hold
BH1-0.5-0.7		✓
BH1-0.8-1.0		✓
BH1-1.3-1.5		✓
BH1-1.8-2.0		✓
BH1-2.8-3.0		✓
BH1-3.3-3.5		✓
BH1-3.8-4.0		✓
BH1-4.5-4.7		✓
BH1-5.4-5.6		✓
BH2-0.1-0.4		✓
BH2-1.4-1.5		✓
BH2-1.7-1.95		✓
BH2-2.4-2.5		✓
BH2-2.8-3.0		✓
BH2-3.4-3.5		✓
BH2-3.9-4.0		✓
BH3 -1.4-1.5		✓
BH3-1.9-2.0		✓
BH3-2.4-2.5		✓
BH3-2.9-3.0		✓
BH3 -3.4-3.5		✓
BH3-3.9-4.0		✓
BH3-4.3-4.5		✓
BH3-4.8-5.0		✓
BH3-5.3-5.5		✓
BH3-6.3-6.5		✓
BH4 -1.9-2.0		✓
BH4-2.3-2.5		✓
BH4-2.8-3.0		✓
BH4-3.3-3.5		✓
BH4-3.8-4.0		✓
BH4-4.3-4.5		✓

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Sample ID	PFAS in TCLP Extended	On Hold
BH4-5.3-5.5		✓
BH4-5.8-6.0		✓
BH4-6.3-6.5		✓
BH5 -1.3-1.5		✓
BH5 -1.8-2.0		✓
BH5-2.3-2.5		✓
BH5-2.8-3.0		✓
BH5-3.3-3.5		✓
BH1 - [TRIPLICATE]-0-0.1		✓

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

Additional Info

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

Ming To

Subject: FW: Results for Registration 300836-A E35073B, Paramatta

Ref: 300587-B.
TAT: Standard.
Due: 05/08/2022
MT

From: Alistair Mitchell <AMitchell@jkenvironments.com.au>
Sent: Friday, 29 July 2022 2:23 PM
To: Greta Petzold <GPetzold@envirolab.com.au>
Cc: Vittal Boggaram <VBoggaram@jkenvironments.com.au>
Subject: FW: Results for Registration 300836-A E35073B, Paramatta

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 Greta,

Thanks for the reissued report.

Can I also get additional testing for the following samples:

- Sample 8 (300836) BH7 (0-0.1) - TCLP benzo(a)pyrene; –
- Sample 16 (300587) BH102 (0-0.1) - TCLP PFAS; 16
- Sample 22 (300587) BH104 (0-0.2) - TCLP PFAS; 22
- Sample 26 (300836) BH107 (0-0.1) - TCLP benzo(a)pyrene; –
- Sample 28 (300836) BH107 (0.3-0.45) – PAHs Testing; –
- Sample 33 (300836) BH109 (0.015-0.1) – CEC Testing and TCLP PFAS;–
- Sample 36 (300836) BH110 (0.04-0.1) – CEC and pH Testing;–
- Sample 51 (300836) BH116 (0-0.1) – TCLP PFAS;–
- Sample 57 (300836) BH118 (0-0.1) – TCLP PFAS, CEC and pH Testing; –
- Sample 60 (300836) BH119 (0-0.15) - TCLP Lead;–
- Sample 66 (300836) BH121 (0-0.1) - TCLP benzo(a)pyrene and CEC testing; and–
- Sample 69 (300836) BH122 (0-0.1) – TCLP PFAS. –

Thanks,

Regards
Alistair Mitchell
Environmental Scientist

T: +612 9888 5000
D: 0421 687 953
E: AMitchell@jkenvironments.com.au
www.jkenvironments.com.au

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

JKEnvironments

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From: Greta Petzold <GPetzold@envirolab.com.au>
Sent: Thursday, 28 July 2022 4:52 PM
To: Alistair Mitchell <AMitchell@jkenvironments.com.au>; Samplereceipt <Samplereceipt@envirolab.com.au>

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CERTIFICATE OF ANALYSIS 300587-C

Client Details

Client	JK Environments
Attention	Alistair Mitchell
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E35073B, Parramatta East**
Number of Samples	additional analysis
Date samples received	15/07/2022
Date completed instructions received	22/08/2022

Analysis Details

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

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

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

Report Details

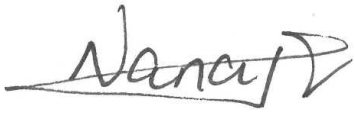
Date results requested by	29/08/2022
Date of Issue	29/08/2022

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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
Giovanni Agosti, Group Technical Manager

Authorised By



Nancy Zhang, Laboratory Manager

Texture and Salinity*		
Our Reference		300587-C-5
Your Reference	UNITS	BH3
Depth		0.4-0.5
Date Sampled		12/07/2022
Type of sample		Soil
Date prepared	-	26/07/2022
Date analysed	-	26/07/2022
Electrical Conductivity 1:5 soil:water	µS/cm	62
Texture Value	-	8.0
Texture	-	LIGHT MEDIUM CLAY
ECe	dS/m	<2
Class	-	NON SALINE

CEC			
Our Reference		300587-C-5	300587-C-33
Your Reference	UNITS	BH3	BH1
Depth		0.4-0.5	0.5-0.7
Date Sampled		12/07/2022	12/07/2022
Type of sample		Soil	Soil
Date prepared	-	29/08/2022	29/08/2022
Date analysed	-	29/08/2022	29/08/2022
Exchangeable Ca	meq/100g	0.7	2.4
Exchangeable K	meq/100g	0.2	<0.1
Exchangeable Mg	meq/100g	8.9	4.9
Exchangeable Na	meq/100g	0.5	<0.1
Cation Exchange Capacity	meq/100g	10	7.5

Method ID	Methodology Summary
Inorg-002	Conductivity and Salinity - measured using a conductivity cell at 25°C in accordance with APHA latest edition 2510 and Rayment & Lyons.
INORG-123	Determined using a "Texture by Feel" method.
Metals-020	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-OES analytical finish.

QUALITY CONTROL: Texture and Salinity*					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			26/07/2022	[NT]	[NT]	[NT]	[NT]	26/07/2022	[NT]
Date analysed	-			26/07/2022	[NT]	[NT]	[NT]	[NT]	26/07/2022	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]

QUALITY CONTROL: CEC					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			29/08/2022	[NT]	[NT]	[NT]	[NT]	29/08/2022	[NT]
Date analysed	-			29/08/2022	[NT]	[NT]	[NT]	[NT]	29/08/2022	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	105	[NT]

Result Definitions

NT	Not tested
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<	Less than
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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	Alistair Mitchell

Sample Login Details

Your reference	E35073B, Parramatta East
Envirolab Reference	300587-C
Date Sample Received	15/07/2022
Date Instructions Received	22/08/2022
Date Results Expected to be Reported	29/08/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	additional analysis
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	14
Cooling Method	Ice
Sampling Date Provided	YES

Comments

BH1/0.5-0.7 salinity/texture already analysed in 300587

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	Texture and Salinity*	CEC	On Hold
BH1 -0-0.1			✓
BH2-0.1-0.4			✓
BH2-0.5-0.7			✓
BH3-0.04-0.1			✓
BH3-0.4-0.5	✓	✓	
BH3-0.8-0.95			✓
BH4-0.04-0.3			✓
BH4-0.5-0.95			✓
BH4-1.3-1.5			✓
BH5-0.04-0.3			✓
BH5-0.5-0.95			✓
BH5-1.5-1.7			✓
BH101-0-0.1			✓
BH101-0.1-0.3			✓
BH101-0.4-0.5			✓
BH102-0-0.1			✓
BH102-0.1-0.3			✓
BH102-0.4-0.6			✓
BH103-0-0.1			✓
BH103-0.1-0.3			✓
BH103-0.4-0.6			✓
BH104-0-0.2			✓
BH104-0.4-0.6			✓
BH112-0-0.1			✓
BH112-0.1-0.4			✓
BH112 -0.5-0.6			✓
SDUP1			✓
SDUP2			✓
SDUP3			✓
TS			✓
TB			✓
FCF1-Surface			✓

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Sample ID	Texture and Salinity*	CEC	On Hold
BH1-0.5-0.7		✓	
BH1-0.8-1.0			✓
BH1-1.3-1.5			✓
BH1-1.8-2.0			✓
BH1-2.8-3.0			✓
BH1-3.3-3.5			✓
BH1-3.8-4.0			✓
BH1-4.5-4.7			✓
BH1-5.4-5.6			✓
BH2-0.1-0.4			✓
BH2-1.4-1.5			✓
BH2-1.7-1.95			✓
BH2-2.4-2.5			✓
BH2-2.8-3.0			✓
BH2-3.4-3.5			✓
BH2-3.9-4.0			✓
BH3 -1.4-1.5			✓
BH3-1.9-2.0			✓
BH3-2.4-2.5			✓
BH3-2.9-3.0			✓
BH3 -3.4-3.5			✓
BH3-3.9-4.0			✓
BH3-4.3-4.5			✓
BH3-4.8-5.0			✓
BH3-5.3-5.5			✓
BH3-6.3-6.5			✓
BH4 -1.9-2.0			✓
BH4-2.3-2.5			✓
BH4-2.8-3.0			✓
BH4-3.3-3.5			✓
BH4-3.8-4.0			✓
BH4-4.3-4.5			✓

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Sample ID	Texture and Salinity*	CEC	On Hold
BH4-5.3-5.5			✓
BH4-5.8-6.0			✓
BH4-6.3-6.5			✓
BH5 -1.3-1.5			✓
BH5 -1.8-2.0			✓
BH5-2.3-2.5			✓
BH5-2.8-3.0			✓
BH5-3.3-3.5			✓
BH1 - [TRIPLICATE]-0-0.1			✓

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

Additional Info

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

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

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

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

Ming To

From: Greta Petzold
Sent: Monday, 22 August 2022 3:27 PM
To: Alistair Mitchell; Samplereceipt
Subject: RE: Results for Registration 300587-B E35073B, Parramatta East

Categories: Additional

Ref: 300587-C
TAT: Standard.
Due: 29/08/2022
MT

Hi Alistair,

No worries, we'll get that booked in for you.

Cheers

Kind Regards,

Greta Petzold | Assistant Operations Manager | Envirolab Services

Great Science. Great Service.

12 Ashley Street Chatswood NSW 2067
T: 61 2 9910 6200
E: GPetzold@envirolab.com.au | W www.envirolab.com.au

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

From: Alistair Mitchell <AMitchell@jkenvironments.com.au>
Sent: Monday, 22 August 2022 3:20 PM
To: Greta Petzold <GPetzold@envirolab.com.au>
Subject: RE: Results for Registration 300587-B E35073B, Parramatta East

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 Greta,

Can I get additional salinity CEC testing for the following samples please?

- Job number 300587- E35073B, BH1 (0.5-0.7); 33
- Job number 300587- E35073B, BH3 (0.4-0.5); 5
- Job number 300836-A- E35073B, BH7 (0.5-0.7); and
- Job number 300836-A - E35073B, BH8 (0.7-0.9).

Thanks,

Regards
Alistair Mitchell
Environmental Scientist

T: +612 9888 5000
D: 0421 687 953
E: AMitchell@jkenvironments.com.au
www.jkenvironments.com.au

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CERTIFICATE OF ANALYSIS 300836

Client Details

Client	JK Environments
Attention	Alistair Mitchell
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E35073B, Paramatta**
Number of Samples	91 Soil, 2 Water, 13 Material
Date samples received	19/07/2022
Date completed instructions received	19/07/2022

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	26/07/2022
Date of Issue	26/07/2022

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

Results Approved By
Hannah Nguyen, Metals Supervisor
Josh Williams, Organics and LC Supervisor
Kyle Gavrily, Senior Chemist
Liam Timmins, Organic Instruments Team Leader
Lucy Zhu, Asbestos Supervisor
Phalak Inthakesone, Organics Development Manager, Sydney

Authorised By



Nancy Zhang, Laboratory Manager

PFAS in Soils Extended						
Our Reference		300836-33	300836-51	300836-57	300836-69	300836-74
Your Reference	UNITS	BH109	BH116	BH118	BH122	SDUP6
Depth		0.015-0.1	0-0.1	0-0.1	0-0.1	-
Date Sampled		15/07/2022	14/07/2022	14/07/2022	14/07/2022	14/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022
Date analysed	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022
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	<0.1
Perfluoroheptanesulfonic acid	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorooctanesulfonic acid PFOS	µg/kg	0.2	1.6	0.9	0.9	1.9
Perfluorodecanesulfonic acid	µg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Perfluorobutanoic acid	µg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Perfluoropentanoic acid	µg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Perfluorohexanoic acid	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoroheptanoic acid	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorooctanoic acid PFOA	µg/kg	<0.1	0.1	0.1	0.1	0.2
Perfluorononanoic acid	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorodecanoic acid	µg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Perfluoroundecanoic acid	µg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Perfluorododecanoic acid	µg/kg	<0.5	<0.5	<0.5	<0.5	<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*	%	103	96	108	99	102
Surrogate $^{13}C_2$ *PFOA*	%	94	90	102	102	104
Extracted ISTD $^{13}C_3$ *PFBS*	%	96	87	86	86	76
Extracted ISTD $^{18}O_2$ *PFHxS*	%	116	103	109	109	102
Extracted ISTD $^{13}C_4$ *PFOS*	%	105	103	94	98	95

PFAS in Soils Extended						
Our Reference		300836-33	300836-51	300836-57	300836-69	300836-74
Your Reference	UNITS	BH109	BH116	BH118	BH122	SDUP6
Depth		0.015-0.1	0-0.1	0-0.1	0-0.1	-
Date Sampled		15/07/2022	14/07/2022	14/07/2022	14/07/2022	14/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Extracted ISTD $^{13}C_4$ *PFBA*	%	92	88	87	83	85
Extracted ISTD $^{13}C_3$ *PFPeA*	%	94	90	89	83	79
Extracted ISTD $^{13}C_2$ *PFHxA*	%	100	98	100	95	88
Extracted ISTD $^{13}C_4$ *PFHpA*	%	108	103	108	101	92
Extracted ISTD $^{13}C_4$ *PFOA*	%	114	109	104	102	101
Extracted ISTD $^{13}C_5$ *PFNA*	%	118	110	112	112	111
Extracted ISTD $^{13}C_2$ *PFDA*	%	112	99	102	94	84
Extracted ISTD $^{13}C_2$ *PFUnDA*	%	130	105	103	109	84
Extracted ISTD $^{13}C_2$ *PFDoDA*	%	134	99	109	95	90
Extracted ISTD $^{13}C_2$ *PFTeDA*	%	101	90	86	86	66
Extracted ISTD $^{13}C_2$ *4:2FTS*	%	99	106	95	78	96
Extracted ISTD $^{13}C_2$ *6:2FTS*	%	116	141	123	112	135
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	136	170	156	135	154
Extracted ISTD $^{13}C_8$ *FOSA*	%	116	107	110	95	93
Extracted ISTD d_3 *N MeFOSA*	%	108	95	81	83	76
Extracted ISTD d_5 *N EtFOSA*	%	110	98	95	96	89
Extracted ISTD d_7 *N MeFOSE*	%	112	109	103	111	101
Extracted ISTD d_9 *N EtFOSE*	%	101	84	87	90	78
Extracted ISTD d_3 *N MeFOSAA*	%	109	111	94	84	94
Extracted ISTD d_5 *N EtFOSAA*	%	111	96	92	96	84
Total Positive PFHxS & PFOS	µg/kg	0.2	1.6	0.9	0.9	1.9
Total Positive PFOS & PFOA	µg/kg	0.2	1.8	1.0	1.0	2.1
Total Positive PFAS	µg/kg	0.2	1.8	1.0	1.0	2.1

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		300836-8	300836-20	300836-23	300836-26	300836-29
Your Reference	UNITS	BH7	BH105	BH106	BH107	BH108
Depth		0-0.1	0.02-0.1	0.02-0.1	0-0.1	0-0.1
Date Sampled		15/07/2022	15/07/2022	15/07/2022	15/07/2022	13/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022
Date analysed	-	23/07/2022	23/07/2022	23/07/2022	23/07/2022	23/07/2022
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	%	77	85	80	84	83

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		300836-33	300836-36	300836-39	300836-43	300836-45
Your Reference	UNITS	BH109	BH110	BH111	BH113	BH114
Depth		0.015-0.1	0.04-0.10	0-0.1	0.1-0.3	0-0.1
Date Sampled		15/07/2022	15/07/2022	13/07/2022	15/07/2022	15/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022
Date analysed	-	23/07/2022	23/07/2022	23/07/2022	23/07/2022	23/07/2022
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	%	83	79	73	76	82

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		300836-48	300836-51	300836-54	300836-57	300836-60
Your Reference	UNITS	BH115	BH116	BH117	BH118	BH119
Depth		0-0.15	0-0.1	0-0.1	0-0.1	0-0.15
Date Sampled		14/07/2022	14/07/2022	14/07/2022	14/07/2022	14/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022
Date analysed	-	23/07/2022	23/07/2022	23/07/2022	23/07/2022	23/07/2022
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	%	86	74	81	77	82

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		300836-63	300836-66	300836-69	300836-78	300836-79
Your Reference	UNITS	BH120	BH121	BH122	TB-S2	TS-S2
Depth		0-0.1	0-0.1	0-0.1	-	-
Date Sampled		14/07/2022	14/07/2022	14/07/2022	15/07/2022	15/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022
Date analysed	-	23/07/2022	23/07/2022	23/07/2022	23/07/2022	23/07/2022
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	[NA]
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	[NA]
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	[NA]
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	95%
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	94%
Ethylbenzene	mg/kg	<1	<1	<1	<1	98%
m+p-xylene	mg/kg	<2	<2	<2	<2	98%
o-Xylene	mg/kg	<1	<1	<1	<1	94%
Naphthalene	mg/kg	<1	<1	<1	<1	[NA]
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	[NA]
Surrogate aaa-Trifluorotoluene	%	76	80	73	92	94

svTRH (C10-C40) in Soil						
Our Reference		300836-8	300836-20	300836-23	300836-26	300836-29
Your Reference	UNITS	BH7	BH105	BH106	BH107	BH108
Depth		0-0.1	0.02-0.1	0.02-0.1	0-0.1	0-0.1
Date Sampled		15/07/2022	15/07/2022	15/07/2022	15/07/2022	13/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022
Date analysed	-	24/07/2022	24/07/2022	24/07/2022	24/07/2022	24/07/2022
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	150	280	170	110
TRH C_{29} - C_{36}	mg/kg	<100	390	730	110	150
Total +ve TRH (C10-C36)	mg/kg	<50	540	1,000	280	260
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	420	890	260	230
TRH >C_{34} -C_{40}	mg/kg	<100	480	730	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	900	1,600	260	230
Surrogate o-Terphenyl	%	84	86	90	95	84

svTRH (C10-C40) in Soil						
Our Reference		300836-33	300836-36	300836-39	300836-43	300836-45
Your Reference	UNITS	BH109	BH110	BH111	BH113	BH114
Depth		0.015-0.1	0.04-0.10	0-0.1	0.1-0.3	0-0.1
Date Sampled		15/07/2022	15/07/2022	13/07/2022	15/07/2022	15/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022
Date analysed	-	24/07/2022	24/07/2022	24/07/2022	24/07/2022	24/07/2022
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	130	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	130	<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	120	<100	<100	110
TRH >C_{34} -C_{40}	mg/kg	<100	220	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	340	<50	<50	110
Surrogate o-Terphenyl	%	79	74	79	81	84

svTRH (C10-C40) in Soil						
Our Reference		300836-48	300836-51	300836-54	300836-57	300836-60
Your Reference	UNITS	BH115	BH116	BH117	BH118	BH119
Depth		0-0.15	0-0.1	0-0.1	0-0.1	0-0.15
Date Sampled		14/07/2022	14/07/2022	14/07/2022	14/07/2022	14/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022
Date analysed	-	24/07/2022	24/07/2022	24/07/2022	24/07/2022	24/07/2022
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	130	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	130	<50
Surrogate o-Terphenyl	%	80	83	78	82	84

svTRH (C10-C40) in Soil				
Our Reference		300836-63	300836-66	300836-69
Your Reference	UNITS	BH120	BH121	BH122
Depth		0-0.1	0-0.1	0-0.1
Date Sampled		14/07/2022	14/07/2022	14/07/2022
Type of sample		Soil	Soil	Soil
Date extracted	-	22/07/2022	22/07/2022	22/07/2022
Date analysed	-	24/07/2022	24/07/2022	24/07/2022
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	120
TRH C_{29} - C_{36}	mg/kg	<100	<100	140
Total +ve TRH (C10-C36)	mg/kg	<50	<50	260
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	220
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	220
Surrogate o-Terphenyl	%	81	83	90

PAHs in Soil						
Our Reference		300836-8	300836-20	300836-23	300836-26	300836-29
Your Reference	UNITS	BH7	BH105	BH106	BH107	BH108
Depth		0-0.1	0.02-0.1	0.02-0.1	0-0.1	0-0.1
Date Sampled		15/07/2022	15/07/2022	15/07/2022	15/07/2022	13/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022
Date analysed	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022
Naphthalene	mg/kg	<0.1	<0.1	<0.1	0.5	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	1.7	<0.1
Acenaphthene	mg/kg	0.3	<0.1	<0.1	0.2	<0.1
Fluorene	mg/kg	0.6	<0.1	<0.1	0.9	<0.1
Phenanthrene	mg/kg	5.8	<0.1	<0.1	12	<0.1
Anthracene	mg/kg	1.3	<0.1	<0.1	2.6	<0.1
Fluoranthene	mg/kg	7.0	<0.1	<0.1	12	0.1
Pyrene	mg/kg	4.5	0.1	<0.1	9.9	0.1
Benzo(a)anthracene	mg/kg	2.5	0.1	<0.1	6.2	<0.1
Chrysene	mg/kg	1.8	<0.1	<0.1	2.9	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	2.9	<0.2	<0.2	4.6	<0.2
Benzo(a)pyrene	mg/kg	1.8	0.1	<0.05	3.0	0.06
Indeno(1,2,3-c,d)pyrene	mg/kg	0.7	<0.1	<0.1	1	<0.1
Dibenzo(a,h)anthracene	mg/kg	0.2	<0.1	<0.1	0.3	<0.1
Benzo(g,h,i)perylene	mg/kg	1.0	0.1	<0.1	1.4	<0.1
Total +ve PAH's	mg/kg	31	0.4	<0.05	60	0.3
Benzo(a)pyrene TEQ calc (zero)	mg/kg	2.7	<0.5	<0.5	4.6	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	2.7	<0.5	<0.5	4.6	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	2.7	<0.5	<0.5	4.6	<0.5
Surrogate p-Terphenyl-d14	%	98	87	89	89	90

PAHs in Soil						
Our Reference		300836-33	300836-36	300836-39	300836-43	300836-45
Your Reference	UNITS	BH109	BH110	BH111	BH113	BH114
Depth		0.015-0.1	0.04-0.10	0-0.1	0.1-0.3	0-0.1
Date Sampled		15/07/2022	15/07/2022	13/07/2022	15/07/2022	15/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022
Date analysed	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022
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	0.2	<0.1	<0.1
Pyrene	mg/kg	<0.1	0.2	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	<0.05	0.1	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	0.2	0.2	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	0.50	1.6	<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	%	89	89	91	93	97

PAHs in Soil						
Our Reference		300836-48	300836-51	300836-54	300836-57	300836-60
Your Reference	UNITS	BH115	BH116	BH117	BH118	BH119
Depth		0-0.15	0-0.1	0-0.1	0-0.1	0-0.15
Date Sampled		14/07/2022	14/07/2022	14/07/2022	14/07/2022	14/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022
Date analysed	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022
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	0.2	<0.1
Pyrene	mg/kg	<0.1	<0.1	0.1	0.2	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	0.05	0.1	0.07	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	0.2	0.4	0.5	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	94	101	92	91	96

PAHs in Soil				
Our Reference		300836-63	300836-66	300836-69
Your Reference	UNITS	BH120	BH121	BH122
Depth		0-0.1	0-0.1	0-0.1
Date Sampled		14/07/2022	14/07/2022	14/07/2022
Type of sample		Soil	Soil	Soil
Date extracted	-	22/07/2022	22/07/2022	22/07/2022
Date analysed	-	22/07/2022	22/07/2022	22/07/2022
Naphthalene	mg/kg	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	0.7	0.2
Anthracene	mg/kg	<0.1	0.1	<0.1
Fluoranthene	mg/kg	<0.1	1.7	0.3
Pyrene	mg/kg	<0.1	1.6	0.3
Benzo(a)anthracene	mg/kg	<0.1	0.9	0.2
Chrysene	mg/kg	<0.1	0.7	0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	1	0.2
Benzo(a)pyrene	mg/kg	<0.05	0.90	0.1
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	0.4	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	0.7	0.1
Total +ve PAH's	mg/kg	<0.05	9.1	1.6
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	1.3	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	1.3	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	1.3	<0.5
Surrogate p-Terphenyl-d14	%	90	96	101

Organochlorine Pesticides in soil						
Our Reference		300836-8	300836-20	300836-23	300836-26	300836-29
Your Reference	UNITS	BH7	BH105	BH106	BH107	BH108
Depth		0-0.1	0.02-0.1	0.02-0.1	0-0.1	0-0.1
Date Sampled		15/07/2022	15/07/2022	15/07/2022	15/07/2022	13/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022
Date analysed	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	90	88	90	84	91

Organochlorine Pesticides in soil						
Our Reference		300836-33	300836-36	300836-39	300836-43	300836-45
Your Reference	UNITS	BH109	BH110	BH111	BH113	BH114
Depth		0.015-0.1	0.04-0.10	0-0.1	0.1-0.3	0-0.1
Date Sampled		15/07/2022	15/07/2022	13/07/2022	15/07/2022	15/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022
Date analysed	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	87	90	91	95	98

Organochlorine Pesticides in soil						
Our Reference		300836-48	300836-51	300836-54	300836-57	300836-60
Your Reference	UNITS	BH115	BH116	BH117	BH118	BH119
Depth		0-0.15	0-0.1	0-0.1	0-0.1	0-0.15
Date Sampled		14/07/2022	14/07/2022	14/07/2022	14/07/2022	14/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022
Date analysed	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022
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	2.0	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	93	95	88	88	94

Organochlorine Pesticides in soil				
Our Reference		300836-63	300836-66	300836-69
Your Reference	UNITS	BH120	BH121	BH122
Depth		0-0.1	0-0.1	0-0.1
Date Sampled		14/07/2022	14/07/2022	14/07/2022
Type of sample		Soil	Soil	Soil
Date extracted	-	22/07/2022	22/07/2022	22/07/2022
Date analysed	-	22/07/2022	22/07/2022	22/07/2022
alpha-BHC	mg/kg	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	92	91	97

Organophosphorus Pesticides in Soil						
Our Reference		300836-8	300836-20	300836-23	300836-26	300836-29
Your Reference	UNITS	BH7	BH105	BH106	BH107	BH108
Depth		0-0.1	0.02-0.1	0.02-0.1	0-0.1	0-0.1
Date Sampled		15/07/2022	15/07/2022	15/07/2022	15/07/2022	13/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022
Date analysed	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
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
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
Ethion	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
Surrogate TCMX	%	90	88	90	84	91

Organophosphorus Pesticides in Soil						
Our Reference		300836-33	300836-36	300836-39	300836-43	300836-45
Your Reference	UNITS	BH109	BH110	BH111	BH113	BH114
Depth		0.015-0.1	0.04-0.10	0-0.1	0.1-0.3	0-0.1
Date Sampled		15/07/2022	15/07/2022	13/07/2022	15/07/2022	15/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022
Date analysed	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
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
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
Ethion	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
Surrogate TCMX	%	87	90	91	95	98

Organophosphorus Pesticides in Soil						
Our Reference		300836-48	300836-51	300836-54	300836-57	300836-60
Your Reference	UNITS	BH115	BH116	BH117	BH118	BH119
Depth		0-0.15	0-0.1	0-0.1	0-0.1	0-0.15
Date Sampled		14/07/2022	14/07/2022	14/07/2022	14/07/2022	14/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022
Date analysed	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
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
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
Ethion	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
Surrogate TCMX	%	93	95	88	88	94

Organophosphorus Pesticides in Soil				
Our Reference		300836-63	300836-66	300836-69
Your Reference	UNITS	BH120	BH121	BH122
Depth		0-0.1	0-0.1	0-0.1
Date Sampled		14/07/2022	14/07/2022	14/07/2022
Type of sample		Soil	Soil	Soil
Date extracted	-	22/07/2022	22/07/2022	22/07/2022
Date analysed	-	22/07/2022	22/07/2022	22/07/2022
Dichlorvos	mg/kg	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	92	91	97

PCBs in Soil						
Our Reference		300836-8	300836-20	300836-23	300836-26	300836-29
Your Reference	UNITS	BH7	BH105	BH106	BH107	BH108
Depth		0-0.1	0.02-0.1	0.02-0.1	0-0.1	0-0.1
Date Sampled		15/07/2022	15/07/2022	15/07/2022	15/07/2022	13/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022
Date analysed	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022
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	%	90	88	90	84	91

PCBs in Soil						
Our Reference		300836-33	300836-36	300836-39	300836-43	300836-45
Your Reference	UNITS	BH109	BH110	BH111	BH113	BH114
Depth		0.015-0.1	0.04-0.10	0-0.1	0.1-0.3	0-0.1
Date Sampled		15/07/2022	15/07/2022	13/07/2022	15/07/2022	15/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022
Date analysed	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022
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	%	87	90	91	95	98

PCBs in Soil						
Our Reference		300836-48	300836-51	300836-54	300836-57	300836-60
Your Reference	UNITS	BH115	BH116	BH117	BH118	BH119
Depth		0-0.15	0-0.1	0-0.1	0-0.1	0-0.15
Date Sampled		14/07/2022	14/07/2022	14/07/2022	14/07/2022	14/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022
Date analysed	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022
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	%	93	95	88	88	94

PCBs in Soil				
Our Reference		300836-63	300836-66	300836-69
Your Reference	UNITS	BH120	BH121	BH122
Depth		0-0.1	0-0.1	0-0.1
Date Sampled		14/07/2022	14/07/2022	14/07/2022
Type of sample		Soil	Soil	Soil
Date extracted	-	22/07/2022	22/07/2022	22/07/2022
Date analysed	-	22/07/2022	22/07/2022	22/07/2022
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	92	91	97

Acid Extractable metals in soil						
Our Reference		300836-8	300836-20	300836-23	300836-26	300836-29
Your Reference	UNITS	BH7	BH105	BH106	BH107	BH108
Depth		0-0.1	0.02-0.1	0.02-0.1	0-0.1	0-0.1
Date Sampled		15/07/2022	15/07/2022	15/07/2022	15/07/2022	13/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	25/07/2022	25/07/2022	25/07/2022	25/07/2022	25/07/2022
Date analysed	-	26/07/2022	26/07/2022	26/07/2022	26/07/2022	26/07/2022
Arsenic	mg/kg	9	<4	4	10	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	0.5	<0.4
Chromium	mg/kg	22	16	17	19	20
Copper	mg/kg	14	29	27	27	10
Lead	mg/kg	22	6	10	58	36
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	7	24	23	10	13
Zinc	mg/kg	41	22	42	120	130

Acid Extractable metals in soil						
Our Reference		300836-33	300836-36	300836-39	300836-43	300836-45
Your Reference	UNITS	BH109	BH110	BH111	BH113	BH114
Depth		0.015-0.1	0.04-0.10	0-0.1	0.1-0.3	0-0.1
Date Sampled		15/07/2022	15/07/2022	13/07/2022	15/07/2022	15/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	25/07/2022	25/07/2022	25/07/2022	25/07/2022	25/07/2022
Date analysed	-	26/07/2022	26/07/2022	26/07/2022	26/07/2022	26/07/2022
Arsenic	mg/kg	5	<4	7	7	14
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	0.5
Chromium	mg/kg	17	8	18	19	20
Copper	mg/kg	28	91	8	15	49
Lead	mg/kg	13	16	29	15	100
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	18	8	5	12	4
Zinc	mg/kg	590	41	32	16	220

Acid Extractable metals in soil						
Our Reference		300836-48	300836-51	300836-54	300836-57	300836-60
Your Reference	UNITS	BH115	BH116	BH117	BH118	BH119
Depth		0-0.15	0-0.1	0-0.1	0-0.1	0-0.15
Date Sampled		14/07/2022	14/07/2022	14/07/2022	14/07/2022	14/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	25/07/2022	25/07/2022	25/07/2022	25/07/2022	25/07/2022
Date analysed	-	26/07/2022	26/07/2022	26/07/2022	26/07/2022	26/07/2022
Arsenic	mg/kg	7	7	19	11	10
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	16	15	31	21	22
Copper	mg/kg	7	15	19	200	31
Lead	mg/kg	33	68	50	74	120
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	3	3	5	4	14
Zinc	mg/kg	76	100	81	110	140

Acid Extractable metals in soil					
Our Reference		300836-63	300836-66	300836-69	300836-107
Your Reference	UNITS	BH120	BH121	BH122	BH109 - [TRIPLICATE]
Depth		0-0.1	0-0.1	0-0.1	0.015-0.1
Date Sampled		14/07/2022	14/07/2022	14/07/2022	15/07/2022
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	25/07/2022	25/07/2022	25/07/2022	25/07/2022
Date analysed	-	26/07/2022	26/07/2022	26/07/2022	26/07/2022
Arsenic	mg/kg	8	10	20	6
Cadmium	mg/kg	<0.4	0.6	<0.4	<0.4
Chromium	mg/kg	20	27	16	17
Copper	mg/kg	8	31	14	22
Lead	mg/kg	33	94	83	15
Mercury	mg/kg	0.4	0.1	<0.1	<0.1
Nickel	mg/kg	3	5	4	14
Zinc	mg/kg	56	230	140	340

Moisture						
Our Reference		300836-8	300836-20	300836-23	300836-26	300836-29
Your Reference	UNITS	BH7	BH105	BH106	BH107	BH108
Depth		0-0.1	0.02-0.1	0.02-0.1	0-0.1	0-0.1
Date Sampled		15/07/2022	15/07/2022	15/07/2022	15/07/2022	13/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022
Date analysed	-	25/07/2022	25/07/2022	25/07/2022	25/07/2022	25/07/2022
Moisture	%	14	5.4	7.2	16	17

Moisture						
Our Reference		300836-33	300836-36	300836-39	300836-43	300836-45
Your Reference	UNITS	BH109	BH110	BH111	BH113	BH114
Depth		0.015-0.1	0.04-0.10	0-0.1	0.1-0.3	0-0.1
Date Sampled		15/07/2022	15/07/2022	13/07/2022	15/07/2022	15/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022
Date analysed	-	25/07/2022	25/07/2022	25/07/2022	25/07/2022	25/07/2022
Moisture	%	8.7	5.1	14	18	31

Moisture						
Our Reference		300836-48	300836-51	300836-54	300836-57	300836-60
Your Reference	UNITS	BH115	BH116	BH117	BH118	BH119
Depth		0-0.15	0-0.1	0-0.1	0-0.1	0-0.15
Date Sampled		14/07/2022	14/07/2022	14/07/2022	14/07/2022	14/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022
Date analysed	-	25/07/2022	25/07/2022	25/07/2022	25/07/2022	25/07/2022
Moisture	%	13	27	43	19	21

Moisture					
Our Reference		300836-63	300836-66	300836-69	300836-74
Your Reference	UNITS	BH120	BH121	BH122	SDUP6
Depth		0-0.1	0-0.1	0-0.1	-
Date Sampled		14/07/2022	14/07/2022	14/07/2022	14/07/2022
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	22/07/2022	22/07/2022	22/07/2022	22/07/2022
Date analysed	-	25/07/2022	25/07/2022	25/07/2022	25/07/2022
Moisture	%	14	17	33	29

Asbestos ID - soils NEPM - ASB-001						
Our Reference		300836-4	300836-8	300836-20	300836-23	300836-26
Your Reference	UNITS	BH5	BH7	BH105	BH106	BH107
Depth		0.04-0.3	0-0.1	0.02-0.1	0.02-0.1	0-0.1
Date Sampled		13/07/2022	15/07/2022	15/07/2022	15/07/2022	15/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	26/07/2022	26/07/2022	26/07/2022	26/07/2022	26/07/2022
Sample mass tested	g	676.3	676.3	953	680.28	714.12
Sample Description	-	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-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		300836-29	300836-33	300836-36	300836-39	300836-43
Your Reference	UNITS	BH108	BH109	BH110	BH111	BH113
Depth		0-0.1	0.015-0.1	0.04-0.10	0-0.1	0.1-0.3
Date Sampled		13/07/2022	15/07/2022	15/07/2022	13/07/2022	15/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	26/07/2022	26/07/2022	26/07/2022	26/07/2022	26/07/2022
Sample mass tested	g	655.69	859.85	727.53	859.91	538.59
Sample Description	-	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown clayey soil & rocks	Brown clayey 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		300836-45	300836-48	300836-51	300836-54	300836-57
Your Reference	UNITS	BH114	BH115	BH116	BH117	BH118
Depth		0-0.1	0-0.15	0-0.1	0-0.1	0-0.1
Date Sampled		15/07/2022	14/07/2022	14/07/2022	14/07/2022	14/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	26/07/2022	26/07/2022	26/07/2022	26/07/2022	26/07/2022
Sample mass tested	g	623.54	827.64	628.06	855.58	696.02
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown fine-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos[#1]	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	Crocidolite	No visible asbestos detected
ACM >7mm Estimation*	g	–	–	–	–	–
FA and AF Estimation*	g	–	–	–	0.0007	–
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		300836-60	300836-63	300836-66	300836-69
Your Reference	UNITS	BH119	BH120	BH121	BH122
Depth		0-0.15	0-0.1	0-0.1	0-0.1
Date Sampled		14/07/2022	14/07/2022	14/07/2022	14/07/2022
Type of sample		Soil	Soil	Soil	Soil
Date analysed	-	26/07/2022	26/07/2022	26/07/2022	26/07/2022
Sample mass tested	g	735.59	684.78	705.21	608.35
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown 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	Chrysotile asbestos detected Amosite asbestos detected Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos#1	g/kg	<0.1	<0.1	<0.1	1.0373
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	Chrysotile Amosite	No visible asbestos detected	See Above
ACM >7mm Estimation*	g	–	–	–	0.6310
FA and AF Estimation*	g	–	0.0090	–	–
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01	<0.01	0.1037
FA and AF Estimation*#2	%(w/w)	<0.001	0.0013	<0.001	<0.001

Asbestos ID - materials					
Our Reference		300836-82	300836-85	300836-91	300836-94
Your Reference	UNITS	FCF1-BH116	FCF1-BH118	FCF1-BH121	FCF3-BH122
Depth		0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		14/07/2022	14/07/2022	14/07/2022	14/07/2022
Type of sample		Material	Material	Material	Material
Date analysed	-	21/07/2022	21/07/2022	21/07/2022	21/07/2022
Mass / Dimension of Sample	-	9.25g	5.35g	2.13g	11.59g
Sample Description	-	Fibre cement material	Fibre cement material	Fibre cement material	Fibre cement material
Asbestos ID in materials	-	Chrysotile asbestos detected Amosite asbestos detected Crocidolite asbestos detected	Chrysotile asbestos detected Amosite asbestos detected Crocidolite asbestos detected	Chrysotile asbestos detected	Chrysotile asbestos detected
Trace Analysis	-	[NT]	[NT]	[NT]	[NT]

BTEX in Water			
Our Reference		300836-80	300836-81
Your Reference	UNITS	FR-S2-SPT	FR-S2-HA
Depth		-	-
Date Sampled		15/07/2022	15/07/2022
Type of sample		Water	Water
Date extracted	-	21/07/2022	21/07/2022
Date analysed	-	22/07/2022	22/07/2022
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
Surrogate Dibromofluoromethane	%	100	102
Surrogate toluene-d8	%	98	97
Surrogate 4-BFB	%	98	101

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

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 5.3 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-1	300836-51
Date prepared	-			22/07/2022	33	22/07/2022	22/07/2022		22/07/2022	22/07/2022
Date analysed	-			22/07/2022	33	22/07/2022	22/07/2022		22/07/2022	22/07/2022
Perfluorobutanesulfonic acid	µg/kg	0.1	Org-029	<0.1	33	<0.1	<0.1	0	105	97
Perfluoropentanesulfonic acid	µg/kg	0.1	Org-029	<0.1	33	<0.1	<0.1	0	86	85
Perfluorohexanesulfonic acid - PFHxS	µg/kg	0.1	Org-029	<0.1	33	<0.1	<0.1	0	94	94
Perfluoroheptanesulfonic acid	µg/kg	0.1	Org-029	<0.1	33	<0.1	<0.1	0	95	97
Perfluorooctanesulfonic acid PFOS	µg/kg	0.1	Org-029	<0.1	33	0.2	0.1	67	102	112
Perfluorodecanesulfonic acid	µg/kg	0.2	Org-029	<0.2	33	<0.2	<0.2	0	94	107
Perfluorobutanoic acid	µg/kg	0.2	Org-029	<0.2	33	<0.2	<0.2	0	107	108
Perfluoropentanoic acid	µg/kg	0.2	Org-029	<0.2	33	<0.2	<0.2	0	102	102
Perfluorohexanoic acid	µg/kg	0.1	Org-029	<0.1	33	<0.1	<0.1	0	102	100
Perfluoroheptanoic acid	µg/kg	0.1	Org-029	<0.1	33	<0.1	<0.1	0	100	91
Perfluorooctanoic acid PFOA	µg/kg	0.1	Org-029	<0.1	33	<0.1	<0.1	0	101	97
Perfluorononanoic acid	µg/kg	0.1	Org-029	<0.1	33	<0.1	<0.1	0	94	87
Perfluorodecanoic acid	µg/kg	0.5	Org-029	<0.5	33	<0.5	<0.5	0	100	104
Perfluoroundecanoic acid	µg/kg	0.5	Org-029	<0.5	33	<0.5	<0.5	0	91	98
Perfluorododecanoic acid	µg/kg	0.5	Org-029	<0.5	33	<0.5	<0.5	0	92	99
Perfluorotridecanoic acid	µg/kg	0.5	Org-029	<0.5	33	<0.5	<0.5	0	105	112
Perfluorotetradecanoic acid	µg/kg	5	Org-029	<5	33	<5	<5	0	107	115
4:2 FTS	µg/kg	0.1	Org-029	<0.1	33	<0.1	<0.1	0	97	96
6:2 FTS	µg/kg	0.1	Org-029	<0.1	33	<0.1	<0.1	0	101	95
8:2 FTS	µg/kg	0.2	Org-029	<0.2	33	<0.2	<0.2	0	105	87
10:2 FTS	µg/kg	0.2	Org-029	<0.2	33	<0.2	<0.2	0	86	128
Perfluorooctane sulfonamide	µg/kg	1	Org-029	<1	33	<1	<1	0	96	95
N-Methyl perfluorooctane sulfonamide	µg/kg	1	Org-029	<1	33	<1	<1	0	107	105
N-Ethyl perfluorooctanesulfon amide	µg/kg	1	Org-029	<1	33	<1	<1	0	101	100
N-Me perfluorooctanesulfonamid oethanol	µg/kg	1	Org-029	<1	33	<1	<1	0	84	72
N-Et perfluorooctanesulfonamid oethanol	µg/kg	5	Org-029	<5	33	<5	<5	0	117	122
MePerfluorooctanesulf- amid oacetic acid	µg/kg	0.2	Org-029	<0.2	33	<0.2	<0.2	0	100	99
EtPerfluorooctanesulf amid oacetic acid	µg/kg	0.2	Org-029	<0.2	33	<0.2	<0.2	0	99	97
Surrogate $^{13}C_8$ *PFOS*	%		Org-029	106	33	103	99	4	102	101
Surrogate $^{13}C_2$ *PFOA*	%		Org-029	98	33	94	98	4	100	98

QUALITY CONTROL: PFAS in Soils Extended						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	300836-51
Extracted ISTD $^{13}C_3$ *PFBS*	%		Org-029	104	33	96	98	2	96	84
Extracted ISTD $^{18}O_2$ *PFHxS*	%		Org-029	117	33	116	117	1	122	105
Extracted ISTD $^{13}C_4$ *PFOS*	%		Org-029	108	33	105	112	6	109	92
Extracted ISTD $^{13}C_4$ *PFBA*	%		Org-029	98	33	92	94	2	100	83
Extracted ISTD $^{13}C_3$ *PFPeA*	%		Org-029	103	33	94	100	6	105	86
Extracted ISTD $^{13}C_2$ *PFHxA*	%		Org-029	112	33	100	106	6	111	96
Extracted ISTD $^{13}C_4$ *PFHpA*	%		Org-029	113	33	108	117	8	113	103
Extracted ISTD $^{13}C_4$ *PFOA*	%		Org-029	113	33	114	116	2	113	106
Extracted ISTD $^{13}C_5$ *PFNA*	%		Org-029	115	33	118	121	3	116	104
Extracted ISTD $^{13}C_2$ *PFDA*	%		Org-029	107	33	112	111	1	110	101
Extracted ISTD $^{13}C_2$ *PFUnDA*	%		Org-029	112	33	130	131	1	119	90
Extracted ISTD $^{13}C_2$ *PFDoDA*	%		Org-029	112	33	134	143	6	119	90
Extracted ISTD $^{13}C_2$ *PFTeDA*	%		Org-029	92	33	101	105	4	110	82
Extracted ISTD $^{13}C_2$ *4:2FTS*	%		Org-029	107	33	99	99	0	108	102
Extracted ISTD $^{13}C_2$ *6:2FTS*	%		Org-029	113	33	116	122	5	110	143
Extracted ISTD $^{13}C_2$ *8:2FTS*	%		Org-029	108	33	136	157	14	102	162
Extracted ISTD $^{13}C_8$ *FOSA*	%		Org-029	118	33	116	122	5	112	98
Extracted ISTD d_3 *N MeFOSA*	%		Org-029	108	33	108	112	4	112	86
Extracted ISTD d_5 *N EtFOSA*	%		Org-029	116	33	110	121	10	114	93
Extracted ISTD d_7 *N MeFOSE*	%		Org-029	124	33	112	123	9	120	103

QUALITY CONTROL: PFAS in Soils Extended						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	300836-51
Extracted ISTD d_9 *N EtFOSE*	%		Org-029	105	33	101	108	7	113	85
Extracted ISTD d_3 *N MeFOSAA*	%		Org-029	103	33	109	131	18	99	108
Extracted ISTD d_5 *N EtFOSAA*	%		Org-029	92	33	111	136	20	93	90

QUALITY CONTROL: PFAS in Soils Extended					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	69	22/07/2022	22/07/2022		[NT]	[NT]
Date analysed	-			[NT]	69	22/07/2022	22/07/2022		[NT]	[NT]
Perfluorobutanesulfonic acid	µg/kg	0.1	Org-029	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Perfluoropentanesulfonic acid	µg/kg	0.1	Org-029	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Perfluorohexanesulfonic acid - PFHxS	µg/kg	0.1	Org-029	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Perfluoroheptanesulfonic acid	µg/kg	0.1	Org-029	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Perfluorooctanesulfonic acid PFOS	µg/kg	0.1	Org-029	[NT]	69	0.9	0.9	0	[NT]	[NT]
Perfluorodecanesulfonic acid	µg/kg	0.2	Org-029	[NT]	69	<0.2	<0.2	0	[NT]	[NT]
Perfluorobutanoic acid	µg/kg	0.2	Org-029	[NT]	69	<0.2	<0.2	0	[NT]	[NT]
Perfluoropentanoic acid	µg/kg	0.2	Org-029	[NT]	69	<0.2	<0.2	0	[NT]	[NT]
Perfluorohexanoic acid	µg/kg	0.1	Org-029	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Perfluoroheptanoic acid	µg/kg	0.1	Org-029	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Perfluorooctanoic acid PFOA	µg/kg	0.1	Org-029	[NT]	69	0.1	<0.1	0	[NT]	[NT]
Perfluorononanoic acid	µg/kg	0.1	Org-029	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Perfluorodecanoic acid	µg/kg	0.5	Org-029	[NT]	69	<0.5	<0.5	0	[NT]	[NT]
Perfluoroundecanoic acid	µg/kg	0.5	Org-029	[NT]	69	<0.5	<0.5	0	[NT]	[NT]
Perfluorododecanoic acid	µg/kg	0.5	Org-029	[NT]	69	<0.5	<0.5	0	[NT]	[NT]
Perfluorotridecanoic acid	µg/kg	0.5	Org-029	[NT]	69	<0.5	<0.5	0	[NT]	[NT]
Perfluorotetradecanoic acid	µg/kg	5	Org-029	[NT]	69	<5	<5	0	[NT]	[NT]
4:2 FTS	µg/kg	0.1	Org-029	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
6:2 FTS	µg/kg	0.1	Org-029	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
8:2 FTS	µg/kg	0.2	Org-029	[NT]	69	<0.2	<0.2	0	[NT]	[NT]
10:2 FTS	µg/kg	0.2	Org-029	[NT]	69	<0.2	<0.2	0	[NT]	[NT]
Perfluorooctane sulfonamide	µg/kg	1	Org-029	[NT]	69	<1	<1	0	[NT]	[NT]
N-Methyl perfluorooctane sulfonamide	µg/kg	1	Org-029	[NT]	69	<1	<1	0	[NT]	[NT]
N-Ethyl perfluorooctanesulfon amide	µg/kg	1	Org-029	[NT]	69	<1	<1	0	[NT]	[NT]
N-Me perfluorooctanesulfonamid oethanol	µg/kg	1	Org-029	[NT]	69	<1	<1	0	[NT]	[NT]
N-Et perfluorooctanesulfonamid oethanol	µg/kg	5	Org-029	[NT]	69	<5	<5	0	[NT]	[NT]
MePerfluorooctanesulf- amid oacetic acid	µg/kg	0.2	Org-029	[NT]	69	<0.2	<0.2	0	[NT]	[NT]
EtPerfluorooctanesulf amid oacetic acid	µg/kg	0.2	Org-029	[NT]	69	<0.2	<0.2	0	[NT]	[NT]
Surrogate $^{13}C_8$ *PFOS*	%		Org-029	[NT]	69	99	105	6	[NT]	[NT]
Surrogate $^{13}C_2$ *PFOA*	%		Org-029	[NT]	69	102	101	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 $^{13}C_3$ *PFBS*	%		Org-029	[NT]	69	86	77	11	[NT]	[NT]
Extracted ISTD $^{18}O_2$ *PFHxS*	%		Org-029	[NT]	69	109	98	11	[NT]	[NT]
Extracted ISTD $^{13}C_4$ *PFOS*	%		Org-029	[NT]	69	98	84	15	[NT]	[NT]
Extracted ISTD $^{13}C_4$ *PFBA*	%		Org-029	[NT]	69	83	70	17	[NT]	[NT]
Extracted ISTD $^{13}C_3$ *PFPeA*	%		Org-029	[NT]	69	83	68	20	[NT]	[NT]
Extracted ISTD $^{13}C_2$ *PFHxA*	%		Org-029	[NT]	69	95	76	22	[NT]	[NT]
Extracted ISTD $^{13}C_4$ *PFHpA*	%		Org-029	[NT]	69	101	79	24	[NT]	[NT]
Extracted ISTD $^{13}C_4$ *PFOA*	%		Org-029	[NT]	69	102	64	46	[NT]	[NT]
Extracted ISTD $^{13}C_5$ *PFNA*	%		Org-029	[NT]	69	112	63	56	[NT]	[NT]
Extracted ISTD $^{13}C_2$ *PFDA*	%		Org-029	[NT]	69	94	45	71	[NT]	[NT]
Extracted ISTD $^{13}C_2$ *PFUnDA*	%		Org-029	[NT]	69	109	36	101	[NT]	[NT]
Extracted ISTD $^{13}C_2$ *PFDoDA*	%		Org-029	[NT]	69	95	34	95	[NT]	[NT]
Extracted ISTD $^{13}C_2$ *PFTeDA*	%		Org-029	[NT]	69	86	17	134	[NT]	[NT]
Extracted ISTD $^{13}C_2$ *4:2FTS*	%		Org-029	[NT]	69	78	65	18	[NT]	[NT]
Extracted ISTD $^{13}C_2$ *6:2FTS*	%		Org-029	[NT]	69	112	74	41	[NT]	[NT]
Extracted ISTD $^{13}C_2$ *8:2FTS*	%		Org-029	[NT]	69	135	83	48	[NT]	[NT]
Extracted ISTD $^{13}C_8$ *FOSA*	%		Org-029	[NT]	69	95	52	59	[NT]	[NT]
Extracted ISTD d_3 *N MeFOSA*	%		Org-029	[NT]	69	83	36	79	[NT]	[NT]
Extracted ISTD d_5 *N EtFOSA*	%		Org-029	[NT]	69	96	50	63	[NT]	[NT]
Extracted ISTD d_7 *N MeFOSE*	%		Org-029	[NT]	69	111	54	69	[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]	69	90	39	79	[NT]	[NT]
Extracted ISTD d_3 *N MeFOSAA*	%		Org-029	[NT]	69	84	34	85	[NT]	[NT]
Extracted ISTD d_5 *N EtFOSAA*	%		Org-029	[NT]	69	96	36	91	[NT]	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	300836-51
Date extracted	-			22/07/2022	33	22/07/2022	22/07/2022		22/07/2022	22/07/2022
Date analysed	-			23/07/2022	33	23/07/2022	23/07/2022		23/07/2022	23/07/2022
TRH C_6 - C_9	mg/kg	25	Org-023	<25	33	<25	<25	0	85	77
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	33	<25	<25	0	85	77
Benzene	mg/kg	0.2	Org-023	<0.2	33	<0.2	<0.2	0	76	71
Toluene	mg/kg	0.5	Org-023	<0.5	33	<0.5	<0.5	0	81	77
Ethylbenzene	mg/kg	1	Org-023	<1	33	<1	<1	0	85	76
m+p-xylene	mg/kg	2	Org-023	<2	33	<2	<2	0	91	81
o-Xylene	mg/kg	1	Org-023	<1	33	<1	<1	0	91	81
Naphthalene	mg/kg	1	Org-023	<1	33	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	88	33	83	84	1	80	76

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	69	22/07/2022	22/07/2022		[NT]	[NT]
Date analysed	-			[NT]	69	23/07/2022	23/07/2022		[NT]	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	[NT]	69	<25	<25	0	[NT]	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	[NT]	69	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	[NT]	69	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	[NT]	69	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	[NT]	69	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	[NT]	69	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-023	[NT]	69	<1	<1	0	[NT]	[NT]
Naphthalene	mg/kg	1	Org-023	[NT]	69	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	69	73	75	3	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	300836-51
Date extracted	-			22/07/2022	33	22/07/2022	22/07/2022		22/07/2022	22/07/2022
Date analysed	-			24/07/2022	33	24/07/2022	24/07/2022		24/07/2022	24/07/2022
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	33	<50	<50	0	108	104
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	33	<100	<100	0	102	110
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	33	<100	<100	0	129	114
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	33	<50	<50	0	108	104
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	33	<100	<100	0	102	110
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	33	<100	<100	0	129	114
Surrogate o-Terphenyl	%		Org-020	79	33	79	81	2	82	83

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	69	22/07/2022	22/07/2022		[NT]	[NT]
Date analysed	-			[NT]	69	24/07/2022	24/07/2022		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	69	<50	<50	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	69	120	100	18	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	69	140	120	15	[NT]	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	[NT]	69	<50	<50	0	[NT]	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	[NT]	69	220	190	15	[NT]	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	[NT]	69	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-020	[NT]	69	90	87	3	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	300836-51
Date extracted	-			22/07/2022	33	22/07/2022	22/07/2022		22/07/2022	22/07/2022
Date analysed	-			22/07/2022	33	22/07/2022	22/07/2022		22/07/2022	22/07/2022
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	82	95
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	83	97
Fluorene	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	84	99
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	90	99
Anthracene	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	96	102
Pyrene	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	107	111
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	81	99
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	33	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	33	<0.05	<0.05	0	96	118
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	91	33	89	89	0	89	99

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	69	22/07/2022	22/07/2022		[NT]	[NT]
Date analysed	-			[NT]	69	22/07/2022	22/07/2022		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-022/025	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	69	0.2	<0.1	67	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-022/025	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	69	0.3	0.2	40	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-022/025	[NT]	69	0.3	0.2	40	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	69	0.2	0.1	67	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	69	0.1	0.1	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	69	0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	69	0.1	0.1	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	69	0.1	0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	69	101	102	1	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	300836-51
Date extracted	-			22/07/2022	33	22/07/2022	22/07/2022		22/07/2022	22/07/2022
Date analysed	-			22/07/2022	33	22/07/2022	22/07/2022		22/07/2022	22/07/2022
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	74	96
HCB	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	82	99
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	89	77
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	99	105
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	90	98
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	96	103
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	90	98
Endrin	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	72	94
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	94	104
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	69	68
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	93	33	87	87	0	83	97

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	69	22/07/2022	22/07/2022		[NT]	[NT]
Date analysed	-			[NT]	69	22/07/2022	22/07/2022		[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
HCB	mg/kg	0.1	Org-022/025	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-022/025	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	69	97	96	1	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	300836-51
Date extracted	-			22/07/2022	33	22/07/2022	22/07/2022		22/07/2022	22/07/2022
Date analysed	-			22/07/2022	33	22/07/2022	22/07/2022		22/07/2022	22/07/2022
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	99	122
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	77	91
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	83	99
Malathion	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	91	128
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	96	108
Parathion	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	84	103
Bromophos-ethyl	mg/kg	0.1	Org-022	<0.1	33	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	96	106
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	33	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	93	33	87	87	0	83	97

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	69	22/07/2022	22/07/2022		[NT]	[NT]
Date analysed	-			[NT]	69	22/07/2022	22/07/2022		[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-022/025	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	69	97	96	1	[NT]	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	300836-51
Date extracted	-			22/07/2022	33	22/07/2022	22/07/2022		22/07/2022	22/07/2022
Date analysed	-			22/07/2022	33	22/07/2022	22/07/2022		22/07/2022	22/07/2022
Aroclor 1016	mg/kg	0.1	Org-021	<0.1	33	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	<0.1	33	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	<0.1	33	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	<0.1	33	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	<0.1	33	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	<0.1	33	<0.1	<0.1	0	124	140
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	33	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	93	33	87	87	0	83	97

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	69	22/07/2022	22/07/2022		[NT]	[NT]
Date analysed	-			[NT]	69	22/07/2022	22/07/2022		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-021	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	[NT]	69	97	96	1	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	300836-51
Date prepared	-			25/07/2022	33	25/07/2022	25/07/2022		25/07/2022	25/07/2022
Date analysed	-			26/07/2022	33	26/07/2022	26/07/2022		26/07/2022	26/07/2022
Arsenic	mg/kg	4	Metals-020	<4	33	5	5	0	102	98
Cadmium	mg/kg	0.4	Metals-020	<0.4	33	<0.4	<0.4	0	102	87
Chromium	mg/kg	1	Metals-020	<1	33	17	19	11	105	105
Copper	mg/kg	1	Metals-020	<1	33	28	35	22	101	101
Lead	mg/kg	1	Metals-020	<1	33	13	16	21	102	70
Mercury	mg/kg	0.1	Metals-021	<0.1	33	<0.1	<0.1	0	97	88
Nickel	mg/kg	1	Metals-020	<1	33	18	22	20	106	91
Zinc	mg/kg	1	Metals-020	<1	33	590	270	74	108	#

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	69	25/07/2022	25/07/2022		[NT]	[NT]
Date analysed	-			[NT]	69	26/07/2022	26/07/2022		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	69	20	32	46	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	69	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	69	16	21	27	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	69	14	20	35	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	69	83	74	11	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	69	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	69	4	3	29	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	69	140	120	15	[NT]	[NT]

QUALITY CONTROL: BTEX in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			21/07/2022	[NT]	[NT]	[NT]	[NT]	21/07/2022	[NT]
Date analysed	-			22/07/2022	[NT]	[NT]	[NT]	[NT]	22/07/2022	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	106	[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]	105	[NT]
Surrogate Dibromofluoromethane	%		Org-023	100	[NT]	[NT]	[NT]	[NT]	104	[NT]
Surrogate toluene-d8	%		Org-023	97	[NT]	[NT]	[NT]	[NT]	101	[NT]
Surrogate 4-BFB	%		Org-023	103	[NT]	[NT]	[NT]	[NT]	102	[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.

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-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.

Factual description of asbestos identified in the soil samples: NEPM
Sample 300836-54; Crocidolite asbestos identified in 0.0007g of loose fibre bundles

Sample 300836-63; Chrysotile and Amosite asbestos identified in 0.0112g of fibrous matted material

Sample 300836-69; Chrysotile and Amosite asbestos identified in 4.2068g of fibre cement material >7mm

Acid Extractable Metals in Soil:
- The laboratory RPD acceptance criteria has been exceeded for 300836-33 for Zn. Therefore a triplicate result has been issued as laboratory sample number 300836-107.
- # Percent recovery is not possible to report due to the inhomogeneous nature of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.

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SAMPLE RECEIPT ADVICE

Client Details

Client	JK Environments
Attention	Alistair Mitchell

Sample Login Details

Your reference	E35073B, Paramatta
Envirolab Reference	300836
Date Sample Received	19/07/2022
Date Instructions Received	19/07/2022
Date Results Expected to be Reported	26/07/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	87 Soil, 2 Water, 13 Material
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	10
Cooling Method	Ice
Sampling Date Provided	YES

Comments

There was one additional jar not listed on the COC - BH108/1.6-1.65. Placed on hold.

Also - with you additional note about the NEPM asb samples. The first 4 samples - we didn't get.

BH1/ 0-0.1
BH2/ 0.1-0.4
BH3/ 0.04-0.3
BH5/ 0.04-0.3

The other 4 were added to out report # 300587

BH101 /0-0.1
BH102/0-0.1
BH104/0-0.1

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	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 - materials	BTEX in Water	On Hold
BH4-0.04-0.3												✓
BH4-0.5-0.95												✓
BH4-1.3-1.5												✓
BH5-0.04-0.3									✓			
BH5-0.5-0.95												✓
BH6-0-0.2												✓
BH6-0.5-0.8												✓
BH7-0-0.1		✓	✓	✓	✓	✓	✓	✓	✓			
BH7-0.5-0.7												✓
BH7-1.0-1.2												✓
BH8-0.1-0.3												✓
BH8-0.7-0.9												✓
BH101 -0.1-0.3												✓
BH101-0.4-0.5												✓
BH102 -0.1-0.3												✓
BH102-0.4-0.6												✓
BH103-0.1-0.3												✓
BH103-0.5-0.6												✓
BH104-0.4-0.6												✓
BH105-0.02-0.1		✓	✓	✓	✓	✓	✓	✓	✓			
BH105-0.2-0.3												✓
BH105-1.0-1.1												✓
BH106-0.02-0.1		✓	✓	✓	✓	✓	✓	✓	✓			
BH106-0.1-0.3												✓
BH106-1.1-1.3												✓
BH107-0-0.1		✓	✓	✓	✓	✓	✓	✓	✓			
BH107-0.1-0.3												✓
BH107-0.3-0.45												✓
BH108-0-0.1		✓	✓	✓	✓	✓	✓	✓	✓			
BH108-0.1-0.3												✓
BH108-0.5-0.95												✓
BH108-1.5-1.6												✓

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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 - materials	BTEX in Water	On Hold
BH109-0.015-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓			
BH109-0.1-0.3												✓
BH109-0.4-0.6												✓
BH110-0.04-0.10		✓	✓	✓	✓	✓	✓	✓	✓			
BH110-0.1-0.3												✓
BH110-0.5-0.7												✓
BH111-0-0.1		✓	✓	✓	✓	✓	✓	✓	✓			
BH111-0.1-0.3												✓
BH111-0.4-0.6												✓
BH113-0-0.1												✓
BH113-0.1-0.3		✓	✓	✓	✓	✓	✓	✓	✓			
BH113-0.5-0.7												✓
BH114-0-0.1		✓	✓	✓	✓	✓	✓	✓	✓			
BH114-0.1-0.2												✓
BH114-0.3-0.5												✓
BH115-0-0.15		✓	✓	✓	✓	✓	✓	✓	✓			
BH115-0.3-0.5												✓
BH115-0.95-1.0												✓
BH116-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓			
BH116-0.1-0.3												✓
BH116-0.5-0.6												✓
BH117-0-0.1		✓	✓	✓	✓	✓	✓	✓	✓			
BH117-0.1-0.2												✓
BH117-0.3-0.5												✓
BH118-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓			
BH118-0.1-0.2												✓
BH118-0.3-0.5												✓
BH119-0-0.15		✓	✓	✓	✓	✓	✓	✓	✓			
BH119-0.3-0.5												✓
BH119-1.0-1.1												✓
BH120-0-0.1		✓	✓	✓	✓	✓	✓	✓	✓			
BH120-0.2-0.4												✓

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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 - materials	BTEX in Water	On Hold
BH120-0.5-0.7												✓
BH121-0-0.1		✓	✓	✓	✓	✓	✓	✓	✓			
BH121-0.1-0.2												✓
BH121-0.4-0.6												✓
BH122-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓			
BH122-0.1-0.3												✓
BH122-0.5-0.7												✓
SDUP3												✓
SDUP5 -												✓
SDUP6	✓											
SDUP7												✓
SDUP8												✓
SDUP9												✓
TB-S2		✓										
TS-S2		✓										
FR-S2-SPT											✓	
FR-S2-HA											✓	
FCF1-BH116-0-0.1										✓		
FCF2-BH116-0-0.1												✓
FCF3-BH116-0-0.1												✓
FCF1-BH118-0-0.1										✓		
FCF2-BH118-0-0.1												✓
FCF1-BH120-0-0.1												✓
FCF2-BH120-0-0.1												✓
FCF3-BH120-0.1-0.4												✓
FCF4-BH120-0.1-0.4												✓
FCF1-BH121-0-0.1										✓		
FCF1-BH122-0-0.1												✓
FCF2-BH122-0-0.1												✓
FCF3-BH122-0-0.1										✓		
BH6-1.7-2.0												✓
BH6-2.7-3.0												✓

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

Sample ID	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 - materials	BTEX in Water	On Hold
BH7 -2.8-3.0												✓
BH7-3.3-3.6												✓
BH8 -0.7-0.9												✓
BH8-1.7-2.0												✓
BH8-2.6-2.8												✓
BH108-1.6-1.65												✓

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	JKE Job Number: E35073B	JKEnvironments
12 ASHLEY STREET		REAR OF 115 WICKS ROAD
CHATSWOOD NSW 2067		MACQUARIE PARK, NSW 2113
P: (02) 99106200	Date Results Required: STANDARD	P: 02-9888 5000 F: 02-9888 5001
F: (02) 99106201		Attention: Allstair Mitchell
Attention: Aileen	Page: 1 of 4	amitchell@jkenvironments.com.au

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

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 2	Combo 3	Combo 6	Asbestos 500mL	PFAS - Routine	BTEX	Asbestos					
12/07/2022	1	BH4	0.04-0.3	A	–	F: Gravelly Sand												
12/07/2022	2	BH4	0.5-0.95	A	–	Silty Clay												
12/07/2022	3	BH4	1.3-1.5	A	–	Silty Clay												
13/07/2022	4	BH5	0.04-0.3	A	–	F: Gravelly Sand												
13/07/2022	5	BH5	0.5-0.95	A	–	Silty Clay												
15/07/2022	6	BH6	0-0.2	G, A	0	F: Silty Sand												
15/07/2022	7	BH6	0.5-0.8	G, A	0	Silty Clay												
15/07/2022	8	BH7	0-0.1	G, A	0	F: Silty Clay			X	X								
15/07/2022	9	BH7	0.5-0.7	G, A	0	F: Silty Clay												
15/07/2022	10	BH7	1.0-1.2	G, A	0	Silty Clay												
15/07/2022	11	BH8	0.1-0.3	G, A	0	F: Silty Clay												
15/07/2022	12	BH8	0.7-0.9	G, A	1.5	Silty Clay												
13/07/2022	–	BH101	0-0.1	A	–	F: Silty Clay												
13/07/2022	13	BH101	0.1-0.3	A	–	F: Silty Clay												
13/07/2022	14	BH101	0.4-0.5	A	–	Silty Clay												
13/07/2022	–	BH102	0-0.1	A	–	F: Sandy Clay												
13/07/2022	15	BH102	0.1-0.3	A	–	F: Sandy Clay												
13/07/2022	16	BH102	0.4-0.6	A	–	Silty Clay												
13/07/2022	–	BH103	0-0.1	A	–	F: Sandy Clay												
13/07/2022	17	BH103	0.1-0.3	A	–	F: Sandy Clay												
13/07/2022	18	BH103	0.5-0.6	A	–	Silty Clay												
13/07/2022	–	BH104	0-0.2	A	–	F: Sandy Clay												
13/07/2022	19	BH104	0.4-0.6	A	–	Silty Clay												

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

Relinquished By:	Date: 19.7.22	Time: 1400	Received By: TJHAN	Date: 19-7-2022

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

Job No: 300836
Date Received: 19.7.2022
Time Received: 1400
Received by: TJHAN
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: E35073B Date Results Required: STANDARD Page: 2 of 4	JKEnvironments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: Alistair Mitchell amitchell@jkenvironments.com.au

Location:	Paramatta						Sample Preserved in Esky on Ice										
Sampler:	HW						Tests Required										
Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 2	Combo 3	Combo 6	Asbestos 500mL	PFAS - Routine	BTEX	Asbestos				
15/07/2022	20	BH105	0.02-0.1	G, A	0.1	F: Sandy Gravel			X	X							
15/07/2022	21	BH105	0.2-0.3	G, A	0	Sandy Clay											
15/07/2022	22	BH105	1.0-1.1	G, A	0	Silty Clay											
15/07/2022	23	BH106	0.02-0.1	G, A	0	F: Sandy Gravel			X	X							
15/07/2022	24	BH106	0.1-0.3	G, A	0	Silty Clay											
15/07/2022	25	BH106	1.1-1.3	G, A	0.1	Silty Clay											
15/07/2022	26	BH107	0-0.1	G, A, P	0	F: Sandy Clay			X	X							
15/07/2022	27	BH107	0.1-0.3	G, A, P	0	F: Sandy clay											
15/07/2022	28	BH107	0.3-0.45	G, A, P	0.1	Silty Clay											
13/07/2022	29	BH108	0-0.1	G, A	0.1	F: Silty Sandy Clay			X	X							
13/07/2022	30	BH108	0.1-0.3	G, A	0.2	F: Silty Sandy Clay											
13/07/2022	31	BH108	0.5-0.95	G, A	0.1	Silty Clay											
13/07/2022	32	BH108	1.5-1.6	G, A	0.4	Silty Clay											
15/07/2022	33	BH109	0.015-0.1	G, A, P	0.1	F: Sandy Gravel			X	X	X						
15/07/2022	34	BH109	0.1-0.3	G, A, P	0.1	F: Clayey Sand											
15/07/2022	35	BH109	0.4-0.6	G, A, P	0	Silty Clay											
15/07/2022	36	BH110	0.04-0.10	G, A	0.1	F: Sandy Gravel			X	X							
15/07/2022	37	BH110	0.1-0.3	G, A	0.1	F: Silty Clay											
15/07/2022	38	BH110	0.5-0.7	G, A	0	Silty Clay											
13/07/2022	39	BH111	0-0.1	G, A	0.1	F: Silty Clay			X	X							
13/07/2022	40	BH111	0.1-0.3	G, A	0.1	F: Silty Clay											
13/07/2022	41	BH111	0.4-0.6	G, A	0.1	Silty Clay											
15/07/2022	42	BH113	0-0.1	G, A	0	F: Clayey Sand											
15/07/2022	43	BH113	0.1-0.3	G, A	0	F: Silty Clay			X	X							
15/07/2022	44	BH113	0.5-0.7	G, A	0	Silty Clay											

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

Relinquished By:	Date: 19.7.22	Time:	Received By:	Date:

#300836
19.7.22
TJ

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: E35073B Date Results Required: STANDARD Page: 3 of 4	JKEnvironments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: Alistair Mitchell amitchell@jkenvironments.com.au

Location:	Paramatta						Sample Preserved in Esky on Ice										
Sampler:	HW						Tests Required										
Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 2	Combo 3	Combo 6	Asbestos 500mL	PFAS - Routine	BTEX	Asbestos				
15/07/2022	45	BH114	0-0.1	G, A	0	F: Silty Clay			X	X							
15/07/2022	46	BH114	0.1-0.2	G, A	0	F: Silty Clay											
15/07/2022	47	BH114	0.3-0.5	G, A	0	Silty Clay											
14/07/2022	48	BH115	0-0.15	G, A	0	F: Clayey Sand			X	X							
14/07/2022	49	BH115	0.3-0.5	G, A	0.1	Silty Clay											
14/07/2022	50	BH115	0.95-1.0	G	0	XW Sandstone											
14/07/2022	51	BH116	0-0.1	G, A, P	0.1	F: Silty Clay			X	X	X						
14/07/2022	52	BH116	0.1-0.3	G, A, P	0	F: Silty Clay											
14/07/2022	53	BH116	0.5-0.6	G, A, P	0	Silty Clay											
14/07/2022	54	BH117	0-0.1	G, A	0	F: Silty Gravelly Clay			X	X							
14/07/2022	55	BH117	0.1-0.2	G, A	0	F: Silty Gravelly Clay											
14/07/2022	56	BH117	0.3-0.5	G, A	0	Silty Clay											
14/07/2022	57	BH118	0-0.1	G, A, P		F: Clayey Gravelly Sand			X	X	X						
14/07/2022	58	BH118	0.1-0.2	G, A, P	0	Clayey Gravelly Sand											
14/07/2022	59	BH118	0.3-0.5	G, A, P	0	Silty Clay											
14/07/2022	60	BH119	0-0.15	G, A, P	0	F: Silty Clay			X	X							
14/07/2022	61	BH119	0.3-0.5	G, A, P	0	Silty Clay											
14/07/2022	62	BH119	1.0-1.1	G, A, P	0	Silty Clay											
14/07/2022	63	BH120	0-0.1	G, A	0	F: Silty Clay			X	X							
14/07/2022	64	BH120	0.2-0.4	G, A	0	F: Silty Clay											
14/07/2022	65	BH120	0.5-0.7	G, A	0	Silty Clay											
14/07/2022	66	BH121	0-0.1	G, A, P	0.8	F: Silty Clay			X	X							
14/07/2022	67	BH121	0.1-0.2	G, A, P	0	F: Silty Clay											
14/07/2022	68	BH121	0.4-0.6	G, A, P	0	Silty Clay											
14/07/2022	69	BH122	0-0.1	G, A, P	0	F: Silty clay			X	X	X						

Remarks (comments/detection limits required):	Sample Containers: G - 250mg Glass Jar A - Ziplock Asbestos Bag P - PFAS Jar			
Relinquished By:	Date: 19.7.22	Time:	Received By:	Date:

#300836
19-7-22
T-S

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: E35073B Date Results Required: STANDARD Page: 4 of 4	JKEnvironments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: Alistair Mitchell amitchell@jkenvironments.com.au

Location:	Paramatta						Sample Preserved in Esky on Ice											
Sampler:	HW						Tests Required											
Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 2	Combo 3	Combo 6	Asbestos 500mL	PFAS - Routine	BTEX	Asbestos					
14/07/2022	70	BH122	0.1-0.3	G, A, P	0.2	F: Silty clay												
14/07/2022	71	BH122	0.5-0.7	G, A, P	0.2	Silty Clay												
13/07/2022	72	SDUP3	–	G, A, P	–	Soil Duplicate												
13/07/2022	#	SDUP4	–	G, A	–	Soil Duplicate			X	X		Please send to VIC						
14/07/2022	73	SDUP5	–	G, A, P	–	Soil Duplicate												
14/07/2022	74	SDUP6	–	G, A, P	–	Soil Duplicate					X							
14/07/2022	75	SDUP7	–	G, A, P	–	Soil Duplicate												
15/07/2022	76	SDUP8	–	G	–	Soil Duplicate												
15/07/2022	77	SDUP9	–	G, A, P	–	Soil Duplicate												
15/07/2022	78	TB-S2	–	V	–	Trip Blank						X						
15/07/2022	79	TS-S2	–	V	–	Trip Spike						X						
15/07/2022	80	FR-S2-SPT	–	Vx2	–	Field Rinsate						X						
15/07/2022	81	FR-S2-HA	–	Vx2	–	Field Rinsate						X						
14/07/2022	82	FCF1-BH116	0-0.1	A	–	Fragment							X					
14/07/2022	83	FCF2-BH116	0-0.1	A	–	Fragment												
14/07/2022	84	FCF3-BH116	0-0.1	A	–	Fragment												
14/07/2022	85	FCF1-BH118	0-0.1	A	–	Fragment							X					
14/07/2022	86	FCF2-BH118	0-0.1	A	–	Fragment												
14/07/2022	87	FCF1-BH120	0-0.1	A	–	Fragment												
14/07/2022	88	FCF2-BH120	0-0.1	A	–	Fragment							X					
14/07/2022	89	FCF3-BH120	0.1-0.4	A	–	Fragment												
14/07/2022	90	FCF4-BH120	0.1-0.4	A	–	Fragment												
14/07/2022	91	FCF1-BH121	0-0.1	A	–	Fragment							X					
14/07/2022	92	FCF1-BH122	0-0.1	A	–	Fragment												
14/07/2022	93	FCF2-BH122	0-0.1	A	–	Fragment												
14/07/2022	94	FCF3-BH122	0-0.1	A	–	Fragment							X					

Remarks (comments/detection limits required):	Sample Containers:
# - Please send to Envirolab VIC	G - 250mg Glass Jar A - Ziplock Asbestos Bag P - PFAS Jar

Relinquished By:	Date: 19.7.22	Time:	Received By:	Date:

300836
TJ
19-7-22

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: E35073B

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: Alistair Mitchell
amitchell@jkenvironments.com.au

Location: Paramatta
Sampler: HW

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)	pH	EC	ECe (texture)	Sulphate	Chloride	Resistivity				
15/07/2022	6	BH6	0-0.2	P, G	F: Silty Sand												
15/07/2022	7	BH6	0.5-0.8	P, G	Silty Clay												
15/07/2022	95	BH6	1.7-2.0	P, G	XW Sandstone												
15/07/2022	96	BH6	2.7-3.0	P, G	Sandstone		X	X	X		X	X	X				
15/07/2022	8	BH7	0-0.1	P, G	F: Silty Clay												
15/07/2022	9	BH7	0.5-.7	P, G	Silty Clay		X	X	X		X	X	X				
15/07/2022	10	BH7	1.0-1.2	P, G	Silty Clay		X	X	X		X	X	X				
15/07/2022	97	BH7	2.8-3.0	P, G	XW Sandstone		X										
15/07/2022	98	BH7	3.3-3.6	P, G	Sandstone		X	X	X		X	X	X				
15/07/2022	11	BH8	0.1-0.3	P, G	F: Silty Clay												
15/07/2022	12	BH8	0.7-0.9	P, G	Silty Clay		X	X	X		X	X	X				
15/07/2022	99	BH8	1.7-2.0	G	Silty Clay		X										
15/07/2022	100	BH8	2.6-2.8	P, G	XW Sandstone		X	X	X		X	X	X				
15/07/2022	101	BH8	3.5-3.7	P, G	Sandstone		X										
	102	BH108	1.6-1.65														

Remarks (comments/detection limits required):

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

Relinquished By:	Date: 19.7.22	Time:	Received By:	Date:
[signature]				

#300836
T.J
19-7-2022

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

CERTIFICATE OF ANALYSIS 300836-A

Client Details

Client	JK Environments
Attention	Alistair Mitchell
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E35073B, Paramatta**
Number of Samples	89 Soil, 13 Material
Date samples received	19/07/2022
Date completed instructions received	19/07/2022

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	26/07/2022
Date of Issue	28/07/2022
Reissue Details	This report replaces R00 created on 26/07/2022 due to: sample ID error

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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

Authorised By

Nancy Zhang, Laboratory Manager

Misc Inorg - Soil						
Our Reference		300836-A-9	300836-A-10	300836-A-12	300836-A-96	300836-A-98
Your Reference	UNITS	BH7	BH7	BH8	BH6	BH7
Depth		0.5-0.7	1.0-1.2	0.7-0.9	2.7-3.0	3.3-3.6
Date Sampled		15/07/2022	15/07/2022	15/07/2022	15/07/2022	15/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	26/07/2022	26/07/2022	26/07/2022	26/07/2022	26/07/2022
Date analysed	-	26/07/2022	26/07/2022	26/07/2022	26/07/2022	26/07/2022
pH 1:5 soil:water	pH Units	6.6	5.8	5.8	6.0	6.4
Electrical Conductivity 1:5 soil:water	µS/cm	44	52	41	40	34
Chloride, Cl 1:5 soil:water	mg/kg	<10	<10	<10	20	<10
Sulphate, SO4 1:5 soil:water	mg/kg	20	61	49	31	33
Resistivity in soil*	ohm m	230	190	240	250	300

Misc Inorg - Soil		
Our Reference		300836-A-100
Your Reference	UNITS	BH8
Depth		2.6-2.8
Date Sampled		15/07/2022
Type of sample		Soil
Date prepared	-	26/07/2022
Date analysed	-	26/07/2022
pH 1:5 soil:water	pH Units	5.5
Electrical Conductivity 1:5 soil:water	µS/cm	64
Chloride, Cl 1:5 soil:water	mg/kg	41
Sulphate, SO4 1:5 soil:water	mg/kg	42
Resistivity in soil*	ohm m	160

sPOCAS field test						
Our Reference		300836-A-9	300836-A-10	300836-A-12	300836-A-96	300836-A-97
Your Reference	UNITS	BH7	BH7	BH8	BH6	BH7
Depth		0.5-0.7	1.0-1.2	0.7-0.9	2.7-3.0	2.8-3.0
Date Sampled		15/07/2022	15/07/2022	15/07/2022	15/07/2022	15/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	21/07/2022	21/07/2022	21/07/2022	21/07/2022	21/07/2022
Date analysed	-	21/07/2022	21/07/2022	21/07/2022	21/07/2022	21/07/2022
pH_F (field pH test)	pH Units	7.8	7.8	7.3	6.8	6.4
pH_{FOX} (field peroxide test)	pH Units	5.8	4.4	4.2	4.8	5.0
Reaction Rate*	-	Low reaction	Low reaction	Low reaction	Low reaction	Low reaction

sPOCAS field test					
Our Reference		300836-A-98	300836-A-99	300836-A-100	300836-A-101
Your Reference	UNITS	BH7	BH8	BH8	BH8
Depth		3.3-3.6	1.7-2.0	2.6-2.8	3.5-3.7
Date Sampled		15/07/2022	15/07/2022	15/07/2022	15/07/2022
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	21/07/2022	21/07/2022	21/07/2022	21/07/2022
Date analysed	-	21/07/2022	21/07/2022	21/07/2022	21/07/2022
pH_F (field pH test)	pH Units	6.2	5.9	5.9	5.9
pH_{FOX} (field peroxide test)	pH Units	4.3	4.2	4.8	4.7
Reaction Rate*	-	Low reaction	Low reaction	Low reaction	Low reaction

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.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell at 25oC in accordance with APHA 22nd ED 2510 and Rayment & Lyons. Resistivity is calculated from Conductivity (non NATA). Resistivity (calculated) may not correlate with results otherwise obtained using Resistivity-Current method, depending on the nature of the soil being analysed.
Inorg-063	pH- measured using pH meter and electrode. Soil is oxidised with Hydrogen Peroxide or extracted with water. Based on section H, Acid Sulfate Soils Laboratory Methods Guidelines, Version 2.1 - June 2004. 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.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Waters samples are filtered on receipt prior to analysis. Alternatively determined by colourimetry/turbidity using Discrete Analyser.

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	300836-A-10
Date prepared	-			26/07/2022	98	26/07/2022	26/07/2022		26/07/2022	26/07/2022
Date analysed	-			26/07/2022	98	26/07/2022	26/07/2022		26/07/2022	26/07/2022
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	98	6.4	6.4	0	100	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	<1	98	34	32	6	97	[NT]
Chloride, Cl 1:5 soil:water	mg/kg	10	Inorg-081	<10	98	<10	<10	0	101	94
Sulphate, SO4 1:5 soil:water	mg/kg	10	Inorg-081	<10	98	33	34	3	94	#
Resistivity in soil*	ohm m	1	Inorg-002	<1	98	300	320	6	[NT]	[NT]

QUALITY CONTROL: sPOCAS field test						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			21/07/2022	[NT]	[NT]	[NT]	[NT]	21/07/2022	[NT]
Date analysed	-			21/07/2022	[NT]	[NT]	[NT]	[NT]	21/07/2022	[NT]
pH_F (field pH test)	pH Units		Inorg-063	[NT]	[NT]	[NT]	[NT]	[NT]	103	[NT]
pH_{FOX} (field peroxide test)	pH Units		Inorg-063	[NT]	[NT]	[NT]	[NT]	[NT]	101	[NT]

Result Definitions

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

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

MISC_INORG_DRY:# Percent recovery is not applicable due to the high concentration of the analyte/s in the sample/s. However an acceptable recovery was obtained for the LCS.

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

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SAMPLE RECEIPT ADVICE

Client Details

Client	JK Environments
Attention	Alistair Mitchell

Sample Login Details

Your reference	E35073B, Paramatta
Envirolab Reference	300836-A
Date Sample Received	19/07/2022
Date Instructions Received	19/07/2022
Date Results Expected to be Reported	26/07/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	89 Soil, 13 Material
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	10
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	Misc Inorg - Soil	sPOCAS field test	On Hold
BH4-0.04-0.3			✓
BH4-0.5-0.95			✓
BH4-1.3-1.5			✓
BH5-0.04-0.3			✓
BH5-0.5-0.95			✓
BH6-0-0.2			✓
BH6-0.5-0.8			✓
BH7-0-0.1			✓
BH7-0.5-0.7	✓	✓	
BH7-1.0-1.2	✓	✓	
BH8-0.1-0.3			✓
BH8-0.7-0.9	✓	✓	
BH101 -0.1-0.3			✓
BH101-0.4-0.5			✓
BH102 -0.1-0.3			✓
BH102-0.4-0.6			✓
BH103-0.1-0.3			✓
BH103-0.5-0.6			✓
BH104-0.4-0.6			✓
BH105-0.02-0.1			✓
BH105-0.2-0.3			✓
BH105-1.0-1.1			✓
BH106-0.02-0.1			✓
BH106-0.1-0.3			✓
BH106-1.1-1.3			✓
BH107-0-0.1			✓
BH107-0.1-0.3			✓
BH107-0.3-0.45			✓
BH108-0-0.1			✓
BH108-0.1-0.3			✓
BH108-0.5-0.95			✓
BH108-1.5-1.6			✓

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Sample ID	Misc Inorg - Soil	sPOCAS field test	On Hold
BH109-0.015-0.1			✓
BH109-0.1-0.3			✓
BH109-0.4-0.6			✓
BH110-0.04-0.10			✓
BH110-0.1-0.3			✓
BH110-0.5-0.7			✓
BH111-0-0.1			✓
BH111-0.1-0.3			✓
BH111-0.4-0.6			✓
BH113-0-0.1			✓
BH113-0.1-0.3			✓
BH113-0.5-0.7			✓
BH114-0-0.1			✓
BH114-0.1-0.2			✓
BH114-0.3-0.5			✓
BH115-0-0.15			✓
BH115-0.3-0.5			✓
BH115-0.95-1.0			✓
BH116-0-0.1			✓
BH116-0.1-0.3			✓
BH116-0.5-0.6			✓
BH117-0-0.1			✓
BH117-0.1-0.2			✓
BH117-0.3-0.5			✓
BH118-0-0.1			✓
BH118-0.1-0.2			✓
BH118-0.3-0.5			✓
BH119-0-0.15			✓
BH119-0.3-0.5			✓
BH119-1.0-1.1			✓
BH120-0-0.1			✓
BH120-0.2-0.4			✓

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Sample ID	Misc Inorg - Soil	sPOCAS field test	On Hold
BH120-0.5-0.7			✓
BH121-0-0.1			✓
BH121-0.1-0.2			✓
BH121-0.4-0.6			✓
BH122-0-0.1			✓
BH122-0.1-0.3			✓
BH122-0.5-0.7			✓
SDUP3			✓
SDUP5 -			✓
SDUP6			✓
SDUP7			✓
SDUP8			✓
SDUP9			✓
TB-S2			✓
TS-S2			✓
FR-S2-SPT			✓
FR-S2-HA			✓
FCF1-BH116-0-0.1			✓
FCF2-BH116-0-0.1			✓
FCF3-BH116-0-0.1			✓
FCF1-BH118-0-0.1			✓
FCF2-BH118-0-0.1			✓
FCF1-BH120-0-0.1			✓
FCF2-BH120-0-0.1			✓
FCF3-BH120-0.1-0.4			✓
FCF4-BH120-0.1-0.4			✓
FCF1-BH121-0-0.1			✓
FCF1-BH122-0-0.1			✓
FCF2-BH122-0-0.1			✓
FCF3-BH122-0-0.1			✓
BH6-1.7-2.0			✓
BH6-2.7-3.0	✓	✓	

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Sample ID	Misc Inorg - Soil	sPOCAS field test	On Hold
BH7 -2.8-3.0		✓	
BH7-3.3-3.6	✓	✓	
BH8 -0.7-0.9		✓	
BH8-1.7-2.0	✓	✓	
BH8-2.6-2.8		✓	
BH108-1.6-1.65			✓

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

Additional Info

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

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CERTIFICATE OF ANALYSIS 300836-B

Client Details

Client	JK Environments
Attention	Alistair Mitchell
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E35073B, Paramatta**
Number of Samples	additional analysis
Date samples received	19/07/2022
Date completed instructions received	28/07/2022

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

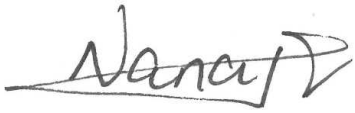
Date results requested by	04/08/2022
Date of Issue	04/08/2022

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Results Approved By
Priya Samarawickrama, Senior Chemist

Authorised By



Nancy Zhang, Laboratory Manager

Chromium Suite			
Our Reference		300836-B-10	300836-B-12
Your Reference	UNITS	BH7	BH8
Depth		1.0-1.2	0.7-0.9
Date Sampled		15/07/2022	15/07/2022
Type of sample		Soil	Soil
Date prepared	-	04/08/2022	04/08/2022
Date analysed	-	04/08/2022	04/08/2022
pH $_{kcl}$	pH units	4.2	4.3
s-TAA pH 6.5	%w/w S	0.13	0.05
TAA pH 6.5	moles H^+ /t	83	31
Chromium Reducible Sulfur	%w/w	<0.005	0.005
a-Chromium Reducible Sulfur	moles H^+ /t	<3	3
S_{HCl}	%w/w S	0.011	0.014
S_{KCl}	%w/w S	0.009	0.010
S_{NAS}	%w/w S	<0.005	<0.005
ANC_{BT}	% $CaCO_3$	[NT]	[NT]
s-ANC_{BT}	%w/w S	[NT]	[NT]
s-Net Acidity	%w/w S	0.14	0.059
a-Net Acidity	moles H^+ /t	86	37
Liming rate	kg $CaCO_3$ /t	6	3
a-Net Acidity without ANCE	moles H^+ /t	86	37
Liming rate without ANCE	kg $CaCO_3$ /t	6.5	2.8
s-Net Acidity without ANCE	%w/w S	0.14	0.059

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. Based on National acid sulfate soils identification and laboratory methods manual June 2018. 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 results reported.

QUALITY CONTROL: Chromium Suite						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			04/08/2022	[NT]	[NT]	[NT]	[NT]	04/08/2022	[NT]
Date analysed	-			04/08/2022	[NT]	[NT]	[NT]	[NT]	04/08/2022	[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]	107	[NT]
Chromium Reducible Sulfur	%w/w	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	102	[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]	[NT]	[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]

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

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SAMPLE RECEIPT ADVICE

Client Details

Client	JK Environments
Attention	Alistair Mitchell

Sample Login Details

Your reference	E35073B, Paramatta
Envirolab Reference	300836-B
Date Sample Received	19/07/2022
Date Instructions Received	28/07/2022
Date Results Expected to be Reported	04/08/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	additional analysis
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	10
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	Chromium Suite	On Hold
BH4-0.04-0.3		✓
BH4-0.5-0.95		✓
BH4-1.3-1.5		✓
BH5-0.04-0.3		✓
BH5-0.5-0.95		✓
BH6-0-0.2		✓
BH6-0.5-0.8		✓
BH7-0-0.1		✓
BH7-0.5-0.7		✓
BH7-1.0-1.2	✓	
BH8-0.1-0.3		✓
BH8-0.7-0.9	✓	
BH101 -0.1-0.3		✓
BH101-0.4-0.5		✓
BH102 -0.1-0.3		✓
BH102-0.4-0.6		✓
BH103-0.1-0.3		✓
BH103-0.5-0.6		✓
BH104-0.4-0.6		✓
BH105-0.02-0.1		✓
BH105-0.2-0.3		✓
BH105-1.0-1.1		✓
BH106-0.02-0.1		✓
BH106-0.1-0.3		✓
BH106-1.1-1.3		✓
BH107-0-0.1		✓
BH107-0.1-0.3		✓
BH107-0.3-0.45		✓
BH108-0-0.1		✓
BH108-0.1-0.3		✓
BH108-0.5-0.95		✓
BH108-1.5-1.6		✓

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Sample ID	Chromium Suite	On Hold
BH109-0.015-0.1		✓
BH109-0.1-0.3		✓
BH109-0.4-0.6		✓
BH110-0.04-0.10		✓
BH110-0.1-0.3		✓
BH110-0.5-0.7		✓
BH111-0-0.1		✓
BH111-0.1-0.3		✓
BH111-0.4-0.6		✓
BH113-0-0.1		✓
BH113-0.1-0.3		✓
BH113-0.5-0.7		✓
BH114-0-0.1		✓
BH114-0.1-0.2		✓
BH114-0.3-0.5		✓
BH115-0-0.15		✓
BH115-0.3-0.5		✓
BH115-0.95-1.0		✓
BH116-0-0.1		✓
BH116-0.1-0.3		✓
BH116-0.5-0.6		✓
BH117-0-0.1		✓
BH117-0.1-0.2		✓
BH117-0.3-0.5		✓
BH118-0-0.1		✓
BH118-0.1-0.2		✓
BH118-0.3-0.5		✓
BH119-0-0.15		✓
BH119-0.3-0.5		✓
BH119-1.0-1.1		✓
BH120-0-0.1		✓
BH120-0.2-0.4		✓

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Sample ID	Chromium Suite	On Hold
BH120-0.5-0.7		✓
BH121-0-0.1		✓
BH121-0.1-0.2		✓
BH121-0.4-0.6		✓
BH122-0-0.1		✓
BH122-0.1-0.3		✓
BH122-0.5-0.7		✓
SDUP3		✓
SDUP5 -		✓
SDUP6		✓
SDUP7		✓
SDUP8		✓
SDUP9		✓
TB-S2		✓
TS-S2		✓
FR-S2-SPT		✓
FR-S2-HA		✓
FCF1-BH116-0-0.1		✓
FCF2-BH116-0-0.1		✓
FCF3-BH116-0-0.1		✓
FCF1-BH118-0-0.1		✓
FCF2-BH118-0-0.1		✓
FCF1-BH120-0-0.1		✓
FCF2-BH120-0-0.1		✓
FCF3-BH120-0.1-0.4		✓
FCF4-BH120-0.1-0.4		✓
FCF1-BH121-0-0.1		✓
FCF1-BH122-0-0.1		✓
FCF2-BH122-0-0.1		✓
FCF3-BH122-0-0.1		✓
BH6-1.7-2.0		✓
BH6-2.7-3.0		✓

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12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
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Sample ID	Chromium Suite	On Hold
BH7 -2.8-3.0		✓
BH7-3.3-3.6		✓
BH8 -1.7-2.0		✓
BH8-2.6-2.8		✓
BH8-3.5-3.7		✓
BH108-1.6-1.65		✓

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

Subject: FW: Results for Registration 300836-A E35073B, Paramatta

Ref: 300836-B
TAT: Standard
Due: 04/08/2022
MT

From: Alistair Mitchell <AMitchell@jkenvironments.com.au>
Sent: Thursday, 28 July 2022 3:48 PM
To: Greta Petzold <GPetzold@envirolab.com.au>
Cc: Vittal Boggaram <VBoggaram@jkenvironments.com.au>
Subject: RE: Results for Registration 300836-A E35073B, Paramatta

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 Greta,

I have noticed there are some samples labelled incorrectly within the 300836 report. Please see below:

- Samples 99 is labelled BH8 (0.7-0.9) in the report but should be labelled BH8 (1.7-2.0) based on the COC;
- Sample 100 is labelled BH8 (1.7-2.0) in the report but should be labelled BH8 (2.6-2.8) based on the COC; and
- Sample 101 is labelled BH8 (2.6-2.8) in the report but should be labelled BH8 (3.5-3.7) based on the COC.

Can get an amended report send out to reflect the correct labelling?

Can I also get additional Chromium Reducible Suite testing for the following samples:

- Sample 37 (300587) BH1 (2.8-3.0);
- Sample 71 (300587) BH5 (2.8-3.0);
- Sample 10 (300836) - BH7 (1.0-1.2); and (10)
- Sample 12 (300836) - BH8 (0.7-0.9). (12)

Thanks,

Regards
Alistair Mitchell
Environmental Scientist

T: +612 9888 5000
D: 0421 687 953
E: AMitchell@jkenvironments.com.au
www.jkenvironments.com.au

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

JKEnvironments

This email and any attachments are confidential and may be privileged in which case neither is intended to be waived. If you have received this message in error, please notify us and remove it from your system. It is your responsibility to check any attachments for viruses and defects before opening or sending them on. At the Company's discretion we may send a paper copy for confirmation. In the event of any discrepancy between paper and electronic versions the paper version is to take precedence.

From: Greta Petzold <GPetzold@envirolab.com.au>
Sent: Tuesday, 26 July 2022 3:46 PM
To: Alistair Mitchell <AMitchell@jkenvironments.com.au>
Subject: Results for Registration 300836-A E35073B, Paramatta

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CERTIFICATE OF ANALYSIS 300836-C

Client Details

Client	JK Environments
Attention	Alistair Mitchell
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E35073B, Paramatta**
Number of Samples	additional analysis
Date samples received	19/07/2022
Date completed instructions received	29/07/2022

Analysis Details

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

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

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

Report Details

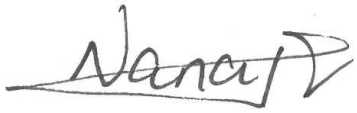
Date results requested by	05/08/2022
Date of Issue	05/08/2022

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

Results Approved By
Hannah Nguyen, Metals Supervisor
Josh Williams, Organics and LC Supervisor
Priya Samarawickrama, Senior Chemist
Steven Luong, Senior Chemist

Authorised By



Nancy Zhang, Laboratory Manager

PAHs in Soil		
Our Reference		300836-C-28
Your Reference	UNITS	BH107
Depth		0.3-0.45
Date Sampled		15/07/2022
Type of sample		Soil
Date extracted	-	03/08/2022
Date analysed	-	05/08/2022
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Total +ve PAH's	mg/kg	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5
Surrogate p-Terphenyl-d14	%	111

Moisture		
Our Reference		300836-C-28
Your Reference	UNITS	BH107
Depth		0.3-0.45
Date Sampled		15/07/2022
Type of sample		Soil
Date prepared	-	03/08/2022
Date analysed	-	04/08/2022
Moisture	%	24

CEC					
Our Reference		300836-C-33	300836-C-36	300836-C-57	300836-C-66
Your Reference	UNITS	BH109	BH110	BH118	BH121
Depth		0.015-0.1	0.04-0.10	0-0.1	0-0.1
Date Sampled		15/07/2022	15/07/2022	14/07/2022	14/07/2022
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	05/08/2022	05/08/2022	05/08/2022	05/08/2022
Date analysed	-	05/08/2022	05/08/2022	05/08/2022	05/08/2022
Exchangeable Ca	meq/100g	9.3	23	7.9	10
Exchangeable K	meq/100g	0.2	0.1	0.3	0.3
Exchangeable Mg	meq/100g	3.1	0.2	1.1	1.6
Exchangeable Na	meq/100g	0.3	<0.1	<0.1	<0.1
Cation Exchange Capacity	meq/100g	13	23	9.2	12

Misc Inorg - Soil			
Our Reference		300836-C-36	300836-C-57
Your Reference	UNITS	BH110	BH118
Depth		0.04-0.10	0-0.1
Date Sampled		15/07/2022	14/07/2022
Type of sample		Soil	Soil
Date prepared	-	05/08/2022	05/08/2022
Date analysed	-	05/08/2022	05/08/2022
pH 1:5 soil:water	pH Units	9.9	6.8

TCLP Preparation - Acid						
Our Reference		300836-C-8	300836-C-26	300836-C-33	300836-C-51	300836-C-57
Your Reference	UNITS	BH7	BH107	BH109	BH116	BH118
Depth		0-0.1	0-0.1	0.015-0.1	0-0.1	0-0.1
Date Sampled		15/07/2022	15/07/2022	15/07/2022	14/07/2022	14/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
pH of soil for fluid# determ.	pH units	8.2	8.0	7.9	8.0	7.9
pH of soil TCLP (after HCl)	pH units	1.6	1.6	1.6	1.6	1.6
Extraction fluid used		1	1	1	1	1
pH of final Leachate	pH units	4.9	4.9	4.9	4.9	4.9

TCLP Preparation - Acid				
Our Reference		300836-C-60	300836-C-66	300836-C-69
Your Reference	UNITS	BH119	BH121	BH122
Depth		0-0.15	0-0.1	0-0.1
Date Sampled		14/07/2022	14/07/2022	14/07/2022
Type of sample		Soil	Soil	Soil
pH of soil for fluid# determ.	pH units	8.0	7.9	7.5
pH of soil TCLP (after HCl)	pH units	1.6	1.6	1.6
Extraction fluid used		1	1	1
pH of final Leachate	pH units	4.9	4.9	4.9

PAHs in TCLP (USEPA 1311)				
Our Reference		300836-C-8	300836-C-26	300836-C-66
Your Reference	UNITS	BH7	BH107	BH121
Depth		0-0.1	0-0.1	0-0.1
Date Sampled		15/07/2022	15/07/2022	14/07/2022
Type of sample		Soil	Soil	Soil
Date extracted	-	04/08/2022	04/08/2022	04/08/2022
Date analysed	-	05/08/2022	05/08/2022	05/08/2022
Naphthalene in TCLP	mg/L	<0.001	<0.001	<0.001
Acenaphthylene in TCLP	mg/L	<0.001	<0.001	<0.001
Acenaphthene in TCLP	mg/L	<0.001	<0.001	<0.001
Fluorene in TCLP	mg/L	<0.001	<0.001	<0.001
Phenanthrene in TCLP	mg/L	<0.001	<0.001	<0.001
Anthracene in TCLP	mg/L	<0.001	<0.001	<0.001
Fluoranthene in TCLP	mg/L	<0.001	<0.001	<0.001
Pyrene in TCLP	mg/L	<0.001	<0.001	<0.001
Benzo(a)anthracene in TCLP	mg/L	<0.001	<0.001	<0.001
Chrysene in TCLP	mg/L	<0.001	<0.001	<0.001
Benzo(bjk)fluoranthene in TCLP	mg/L	<0.002	<0.002	<0.002
Benzo(a)pyrene in TCLP	mg/L	<0.001	<0.001	<0.001
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	<0.001	<0.001	<0.001
Dibenzo(a,h)anthracene in TCLP	mg/L	<0.001	<0.001	<0.001
Benzo(g,h,i)perylene in TCLP	mg/L	<0.001	<0.001	<0.001
Total +ve PAH's	mg/L	NIL (+)VE	NIL (+)VE	NIL (+)VE
Surrogate p-Terphenyl-d14	%	103	90	92

Metals from Leaching Fluid pH 2.9 or 5		
Our Reference		300836-C-60
Your Reference	UNITS	BH119
Depth		0-0.15
Date Sampled		14/07/2022
Type of sample		Soil
Date extracted	-	05/08/2022
Date analysed	-	05/08/2022
Lead	mg/L	<0.03

PFAS in TCLP Extended					
Our Reference		300836-C-33	300836-C-51	300836-C-57	300836-C-69
Your Reference	UNITS	BH109	BH116	BH118	BH122
Depth		0.015-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		15/07/2022	14/07/2022	14/07/2022	14/07/2022
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	05/08/2022	05/08/2022	05/08/2022	05/08/2022
Date analysed	-	05/08/2022	05/08/2022	05/08/2022	05/08/2022
Perfluorobutanesulfonic acid	µg/L	<0.01	<0.01	<0.01	<0.01
Perfluoropentanesulfonic acid	µg/L	<0.01	<0.01	<0.01	<0.01
Perfluorohexanesulfonic acid - PFHxS	µg/L	<0.01	<0.01	<0.01	<0.01
Perfluoroheptanesulfonic acid	µg/L	<0.01	<0.01	<0.01	<0.01
Perfluorooctanesulfonic acid PFOS	µg/L	0.01	<0.01	<0.01	<0.01
Perfluorodecanesulfonic acid	µg/L	<0.02	<0.02	<0.02	<0.02
Perfluorobutanoic acid	µg/L	<0.02	<0.02	<0.02	<0.02
Perfluoropentanoic acid	µg/L	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid	µg/L	<0.01	<0.01	<0.01	<0.01
Perfluoroheptanoic acid	µg/L	<0.01	<0.01	<0.01	<0.01
Perfluorooctanoic acid PFOA	µg/L	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid	µg/L	<0.01	<0.01	<0.01	<0.01
Perfluorodecanoic acid	µg/L	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid	µg/L	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid	µg/L	<0.05	<0.05	<0.05	<0.05
Perfluorotridecanoic acid	µg/L	<0.1	<0.1	<0.1	<0.1
Perfluorotetradecanoic acid	µg/L	<0.5	<0.5	<0.5	<0.5
4:2 FTS	µg/L	<0.01	<0.01	<0.01	<0.01
6:2 FTS	µg/L	<0.01	<0.01	<0.01	<0.01
8:2 FTS	µg/L	<0.02	<0.02	<0.02	<0.02
10:2 FTS	µg/L	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonamide	µg/L	<0.1	<0.1	<0.1	<0.1
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 aci	µg/L	<0.02	<0.02	<0.02	<0.02
EtPerfluorooctanesulf- amid oacetic acid	µg/L	<0.02	<0.02	<0.02	<0.02
Surrogate $^{13}C_8$ *PFOS*	%	109	104	104	108
Surrogate $^{13}C_2$ *PFOA*	%	105	106	101	95
Extracted ISTD $^{13}C_3$ *PFBS*	%	106	103	98	96
Extracted ISTD $^{18}O_2$ *PFHxS*	%	105	102	101	102
Extracted ISTD $^{13}C_4$ *PFOS*	%	103	111	103	103

PFAS in TCLP Extended					
Our Reference		300836-C-33	300836-C-51	300836-C-57	300836-C-69
Your Reference	UNITS	BH109	BH116	BH118	BH122
Depth		0.015-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		15/07/2022	14/07/2022	14/07/2022	14/07/2022
Type of sample		Soil	Soil	Soil	Soil
Extracted ISTD $^{13}C_4$ *PFBA*	%	91	91	86	87
Extracted ISTD $^{13}C_3$ *PFPeA*	%	89	91	85	87
Extracted ISTD $^{13}C_2$ *PFHxA*	%	100	101	94	95
Extracted ISTD $^{13}C_4$ *PFHpA*	%	93	95	91	95
Extracted ISTD $^{13}C_4$ *PFOA*	%	98	99	94	98
Extracted ISTD $^{13}C_5$ *PFNA*	%	105	106	102	98
Extracted ISTD $^{13}C_2$ *PFDA*	%	114	109	108	107
Extracted ISTD $^{13}C_2$ *PFUnDA*	%	106	106	101	102
Extracted ISTD $^{13}C_2$ *PFDoDA*	%	111	110	106	103
Extracted ISTD $^{13}C_2$ *PFTeDA*	%	88	89	76	72
Extracted ISTD $^{13}C_2$ *4:2FTS*	%	65	64	60	61
Extracted ISTD $^{13}C_2$ *6:2FTS*	%	84	84	81	82
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	102	99	97	98
Extracted ISTD $^{13}C_8$ *FOSA*	%	118	118	112	112
Extracted ISTD d_3 *N MeFOSA*	%	107	105	99	101
Extracted ISTD d_5 *N EtFOSA*	%	108	109	100	104
Extracted ISTD d_7 *N MeFOSE*	%	110	108	101	107
Extracted ISTD d_9 *N EtFOSE*	%	107	105	98	101
Extracted ISTD d_3 *N MeFOSAA*	%	85	87	78	80
Extracted ISTD d_5 *N EtFOSAA*	%	86	85	83	82
Total Positive PFHxS & PFOS	µg/L	0.01	<0.01	<0.01	<0.01
Total Positive PFOS & PFOA	µg/L	0.01	<0.01	<0.01	<0.01
Total Positive PFAS	µg/L	0.01	<0.01	<0.01	<0.01

Method ID	Methodology Summary
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using AS 4439 and USEPA 1311. Please note that the mass used may be scaled down from default based on sample mass available. Samples are stored at 2-6oC before and after leachate preparation.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
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-022/025	Leachates are extracted 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 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.

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 5.3 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date extracted	-			03/08/2022	[NT]	[NT]	[NT]	[NT]	03/08/2022	[NT]
Date analysed	-			05/08/2022	[NT]	[NT]	[NT]	[NT]	05/08/2022	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	84	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Fluorene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	110	[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]	100	[NT]
Pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	105	[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]	93	[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-d14	%		Org-022/025	119	[NT]	[NT]	[NT]	[NT]	116	[NT]

QUALITY CONTROL: CEC					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date prepared	-			05/08/2022	[NT]	[NT]	[NT]	[NT]	05/08/2022	[NT]
Date analysed	-			05/08/2022	[NT]	[NT]	[NT]	[NT]	05/08/2022	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	91	[NT]
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	87	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]

QUALITY CONTROL: Misc Inorg - Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date prepared	-			05/08/2022	[NT]	[NT]	[NT]	[NT]	05/08/2022	[NT]
Date analysed	-			05/08/2022	[NT]	[NT]	[NT]	[NT]		[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	102	[NT]

QUALITY CONTROL: PAHs in TCLP (USEPA 1311)					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			04/08/2022	[NT]	[NT]	[NT]	[NT]	04/08/2022	[NT]
Date analysed	-			05/08/2022	[NT]	[NT]	[NT]	[NT]	05/08/2022	[NT]
Naphthalene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	82	[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]	85	[NT]
Fluorene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	82	[NT]
Phenanthrene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	94	[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]	82	[NT]
Pyrene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	91	[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]	81	[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]	94	[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	94	[NT]	[NT]	[NT]	[NT]	95	[NT]

QUALITY CONTROL: Metals from Leaching Fluid pH 2.9 or 5					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			05/08/2022	[NT]	[NT]	[NT]	[NT]	05/08/2022	[NT]
Date analysed	-			05/08/2022	[NT]	[NT]	[NT]	[NT]	05/08/2022	[NT]
Lead	mg/L	0.03	Metals-020	<0.03	[NT]	[NT]	[NT]	[NT]	90	[NT]

QUALITY CONTROL: PFAS in TCLP Extended						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	300836-C-51
Date prepared	-			05/08/2022	33	05/08/2022	05/08/2022		05/08/2022	05/08/2022
Date analysed	-			05/08/2022	33	05/08/2022	05/08/2022		05/08/2022	05/08/2022
Perfluorobutanesulfonic acid	µg/L	0.01	Org-029	<0.01	33	<0.01	<0.01	0	105	101
Perfluoropentanesulfonic acid	µg/L	0.01	Org-029	<0.01	33	<0.01	<0.01	0	103	102
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.01	Org-029	<0.01	33	<0.01	<0.01	0	108	104
Perfluoroheptanesulfonic acid	µg/L	0.01	Org-029	<0.01	33	<0.01	<0.01	0	115	118
Perfluorooctanesulfonic acid PFOS	µg/L	0.01	Org-029	<0.01	33	0.01	0.01	0	109	99
Perfluorodecanesulfonic acid	µg/L	0.02	Org-029	<0.02	33	<0.02	<0.02	0	105	106
Perfluorobutanoic acid	µg/L	0.02	Org-029	<0.02	33	<0.02	<0.02	0	104	102
Perfluoropentanoic acid	µg/L	0.02	Org-029	<0.02	33	<0.02	<0.02	0	105	104
Perfluorohexanoic acid	µg/L	0.01	Org-029	<0.01	33	<0.01	<0.01	0	102	98
Perfluoroheptanoic acid	µg/L	0.01	Org-029	<0.01	33	<0.01	<0.01	0	104	103
Perfluorooctanoic acid PFOA	µg/L	0.01	Org-029	<0.01	33	<0.01	<0.01	0	107	107
Perfluorononanoic acid	µg/L	0.01	Org-029	<0.01	33	<0.01	<0.01	0	98	94
Perfluorodecanoic acid	µg/L	0.02	Org-029	<0.02	33	<0.02	<0.02	0	99	100
Perfluoroundecanoic acid	µg/L	0.02	Org-029	<0.02	33	<0.02	<0.02	0	109	109
Perfluorododecanoic acid	µg/L	0.05	Org-029	<0.05	33	<0.05	<0.05	0	106	104
Perfluorotridecanoic acid	µg/L	0.1	Org-029	<0.1	33	<0.1	<0.1	0	96	94
Perfluorotetradecanoic acid	µg/L	0.5	Org-029	<0.5	33	<0.5	<0.5	0	107	105
4:2 FTS	µg/L	0.01	Org-029	<0.01	33	<0.01	<0.01	0	100	93
6:2 FTS	µg/L	0.01	Org-029	<0.01	33	<0.01	<0.01	0	116	105
8:2 FTS	µg/L	0.02	Org-029	<0.02	33	<0.02	<0.02	0	114	112
10:2 FTS	µg/L	0.02	Org-029	<0.02	33	<0.02	<0.02	0	114	115
Perfluorooctane sulfonamide	µg/L	0.1	Org-029	<0.1	33	<0.1	<0.1	0	106	106
N-Methyl perfluorooctane sulfonamide	µg/L	0.05	Org-029	<0.05	33	<0.05	<0.05	0	110	107
N-Ethyl perfluorooctanesulfon amide	µg/L	0.1	Org-029	<0.1	33	<0.1	<0.1	0	100	98
N-Me perfluorooctanesulfonamid oethanol	µg/L	0.05	Org-029	<0.05	33	<0.05	<0.05	0	115	114
N-Et perfluorooctanesulfonamid oethanol	µg/L	0.5	Org-029	<0.5	33	<0.5	<0.5	0	116	114
MePerfluorooctanesulf- amid oacetic aci	µg/L	0.02	Org-029	<0.02	33	<0.02	<0.02	0	111	114
EtPerfluorooctanesulf- amid oacetic acid	µg/L	0.02	Org-029	<0.02	33	<0.02	<0.02	0	101	100
Surrogate $^{13}C_8$ *PFOS*	%		Org-029	110	33	109	103	6	111	99
Surrogate $^{13}C_2$ *PFOA*	%		Org-029	104	33	105	101	4	100	100

QUALITY CONTROL: PFAS in TCLP Extended						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	300836-C-51
Extracted ISTD $^{13}C_3$ *PFBS*	%		Org-029	99	33	106	103	3	94	98
Extracted ISTD $^{18}O_2$ *PFHxS*	%		Org-029	100	33	105	100	5	96	96
Extracted ISTD $^{13}C_4$ *PFOS*	%		Org-029	100	33	103	110	7	98	107
Extracted ISTD $^{13}C_4$ *PFBA*	%		Org-029	89	33	91	90	1	82	85
Extracted ISTD $^{13}C_3$ *PFPeA*	%		Org-029	89	33	89	89	0	85	85
Extracted ISTD $^{13}C_2$ *PFHxA*	%		Org-029	96	33	100	97	3	89	94
Extracted ISTD $^{13}C_4$ *PFHpA*	%		Org-029	92	33	93	96	3	88	91
Extracted ISTD $^{13}C_4$ *PFOA*	%		Org-029	93	33	98	98	0	92	92
Extracted ISTD $^{13}C_5$ *PFNA*	%		Org-029	100	33	105	107	2	99	100
Extracted ISTD $^{13}C_2$ *PFDA*	%		Org-029	107	33	114	109	4	106	104
Extracted ISTD $^{13}C_2$ *PFUnDA*	%		Org-029	96	33	106	105	1	99	96
Extracted ISTD $^{13}C_2$ *PFDoDA*	%		Org-029	103	33	111	112	1	102	101
Extracted ISTD $^{13}C_2$ *PFTeDA*	%		Org-029	73	33	88	89	1	72	71
Extracted ISTD $^{13}C_2$ *4:2FTS*	%		Org-029	57	33	65	64	2	52	59
Extracted ISTD $^{13}C_2$ *6:2FTS*	%		Org-029	79	33	84	81	4	71	81
Extracted ISTD $^{13}C_2$ *8:2FTS*	%		Org-029	97	33	102	101	1	90	89
Extracted ISTD $^{13}C_8$ *FOSA*	%		Org-029	111	33	118	118	0	108	107
Extracted ISTD d_3 *N MeFOSA*	%		Org-029	99	33	107	105	2	99	96
Extracted ISTD d_5 *N EtFOSA*	%		Org-029	100	33	108	106	2	98	99
Extracted ISTD d_7 *N MeFOSE*	%		Org-029	102	33	110	109	1	101	99

QUALITY CONTROL: PFAS in TCLP Extended						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	300836-C-51
Extracted ISTD d_9 *N EtFOSE*	%		Org-029	100	33	107	109	2	98	97
Extracted ISTD d_3 *N MeFOSAA*	%		Org-029	83	33	85	86	1	77	73
Extracted ISTD d_5 *N EtFOSAA*	%		Org-029	82	33	86	84	2	78	77

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.

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	Alistair Mitchell

Sample Login Details

Your reference	E35073B, Paramatta
Envirolab Reference	300836-C
Date Sample Received	19/07/2022
Date Instructions Received	29/07/2022
Date Results Expected to be Reported	05/08/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	additional analysis
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	10
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	PAHs in Soil	CEC	Misc Inorg - Soil	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	PFAS in TCLP Extended	On Hold
BH4-0.04-0.3																								✓
BH4-0.5-0.95																								✓
BH4-1.3-1.5																								✓
BH5-0.04-0.3																								✓
BH5-0.5-0.95																								✓
BH6-0-0.2																								✓
BH6-0.5-0.8																								✓
BH7-0-0.1				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
BH7-0.5-0.7																								✓
BH7-1.0-1.2																								✓
BH8-0.1-0.3																								✓
BH8-0.7-0.9																								✓
BH101 -0.1-0.3																								✓
BH101-0.4-0.5																								✓
BH102 -0.1-0.3																								✓
BH102-0.4-0.6																								✓
BH103-0.1-0.3																								✓
BH103-0.5-0.6																								✓
BH104-0.4-0.6																								✓
BH105-0.02-0.1																								✓

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Sample ID	PAHs in Soil	CEC	Misc Inorg - Soil	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	PFAS in TCLP Extended	On Hold
BH105-0.2-0.3																								✓
BH105-1.0-1.1																								✓
BH106-0.02-0.1																								✓
BH106-0.1-0.3																								✓
BH106-1.1-1.3																								✓
BH107-0-0.1				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
BH107-0.1-0.3																								✓
BH107-0.3-0.45	✓																							
BH108-0-0.1																								✓
BH108-0.1-0.3																								✓
BH108-0.5-0.95																								✓
BH108-1.5-1.6																								✓
BH109-0.015-0.1		✓		✓																			✓	
BH109-0.1-0.3																								✓
BH109-0.4-0.6																								✓
BH110-0.04-0.10		✓	✓																					
BH110-0.1-0.3																								✓
BH110-0.5-0.7																								✓
BH111-0-0.1																								✓
BH111-0.1-0.3																								✓

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Sample ID	PAHs in Soil	CEC	Misc Inorg - Soil	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	PFAS in TCLP Extended	On Hold
BH111-0.4-0.6																								✓
BH113-0-0.1																								✓
BH113-0.1-0.3																								✓
BH113-0.5-0.7																								✓
BH114-0-0.1																								✓
BH114-0.1-0.2																								✓
BH114-0.3-0.5																								✓
BH115-0-0.15																								✓
BH115-0.3-0.5																								✓
BH115-0.95-1.0																								✓
BH116-0-0.1				✓																			✓	
BH116-0.1-0.3																								✓
BH116-0.5-0.6																								✓
BH117-0-0.1																								✓
BH117-0.1-0.2																								✓
BH117-0.3-0.5																								✓
BH118-0-0.1		✓	✓	✓																			✓	
BH118-0.1-0.2																								✓
BH118-0.3-0.5																								✓
BH119-0-0.15				✓																		✓		

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Sample ID	PAHs in Soil	CEC	Misc Inorg - Soil	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	PFAS in TCLP Extended	On Hold
BH119-0.3-0.5																								✓
BH119-1.0-1.1																								✓
BH120-0-0.1																								✓
BH120-0.2-0.4																								✓
BH120-0.5-0.7																								✓
BH121-0-0.1		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
BH121-0.1-0.2																								✓
BH121-0.4-0.6																								✓
BH122-0-0.1				✓																			✓	
BH122-0.1-0.3																								✓
BH122-0.5-0.7																								✓
SDUP3																								✓
SDUP5 -																								✓
SDUP6																								✓
SDUP7																								✓
SDUP8																								✓
SDUP9																								✓
TB-S2																								✓
TS-S2																								✓
FR-S2-SPT																								✓

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Sample ID	PAHs in Soil	CEC	Misc Inorg - Soil	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	PFAS in TCLP Extended	On Hold
FR-S2-HA																								✓
FCF1-BH116-0-0.1																								✓
FCF2-BH116-0-0.1																								✓
FCF3-BH116-0-0.1																								✓
FCF1-BH118-0-0.1																								✓
FCF2-BH118-0-0.1																								✓
FCF1-BH120-0-0.1																								✓
FCF2-BH120-0-0.1																								✓
FCF3-BH120-0.1-0.4																								✓
FCF4-BH120-0.1-0.4																								✓
FCF1-BH121-0-0.1																								✓
FCF1-BH122-0-0.1																								✓
FCF2-BH122-0-0.1																								✓
FCF3-BH122-0-0.1																								✓
BH6-1.7-2.0																								✓
BH6-2.7-3.0																								✓
BH7 -2.8-3.0																								✓
BH7-3.3-3.6																								✓
BH8 -1.7-2.0																								✓
BH8-2.6-2.8																								✓

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Sample ID	PAHs in Soil	CEC	Misc Inorg - Soil	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	PFAS in TCLP Extended	On Hold
BH8-3.5-3.7																								✓
BH108-1.6-1.65																								✓
BH101-0-0.1																								✓
BH103-0-0.1																								✓
BH103-0-0.1																								✓
BH104-0-0.2																								✓
BH109 - [TRIPLICATE]-0.015-0.1																								✓

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

Additional Info

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

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

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

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

Ming To

Subject: FW: Results for Registration 300836-A E35073B, Paramatta

Ref: 300836-C
TAT: Standard
Due: 05/08/2022
MT

From: Alistair Mitchell <AMitchell@jkenvironments.com.au>
Sent: Friday, 29 July 2022 2:23 PM
To: Greta Petzold <GPetzold@envirolab.com.au>
Cc: Vittal Boggaram <VBoggaram@jkenvironments.com.au>
Subject: FW: Results for Registration 300836-A E35073B, Paramatta

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Hi Greta,

Thanks for the reissued report.

Can I also get additional testing for the following samples:

- Sample 8 (300836) BH7 (0-0.1) - TCLP benzo(a)pyrene; 8
- Sample 16 (300587) BH102 (0-0.1) - TCLP PFAS;–
- Sample 22 (300587) BH104 (0-0.2) - TCLP PFAS;–
- Sample 26 (300836) BH107 (0-0.1) - TCLP benzo(a)pyrene; 26
- Sample 28 (300836) BH107 (0.3-0.45) – PAHs Testing; 28
- Sample 33 (300836) BH109 (0.015-0.1) – CEC Testing and TCLP PFAS; 33
- Sample 36 (300836) BH110 (0.04-0.1) – CEC and pH Testing; 36
- Sample 51 (300836) BH116 (0-0.1) – TCLP PFAS; 51
- Sample 57 (300836) BH118 (0-0.1) – TCLP PFAS, CEC and pH Testing; 57
- Sample 60 (300836) BH119 (0-0.15) - TCLP Lead; 60
- Sample 66 (300836) BH121 (0-0.1) - TCLP benzo(a)pyrene and CEC testing; and 66
- Sample 69 (300836) BH122 (0-0.1) – TCLP PFAS. 69

Thanks,

Regards
Alistair Mitchell
Environmental Scientist

T: +612 9888 5000
D: 0421 687 953
E: AMitchell@jkenvironments.com.au
www.jkenvironments.com.au

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MACQUARIE PARK NSW 2113

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From: Greta Petzold <GPetzold@envirolab.com.au>
Sent: Thursday, 28 July 2022 4:52 PM
To: Alistair Mitchell <AMitchell@jkenvironments.com.au>; Samplereceipt <Samplereceipt@envirolab.com.au>

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CERTIFICATE OF ANALYSIS 300836-D

Client Details

Client	JK Environments
Attention	Alistair Mitchell
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E35073B, Paramatta**
Number of Samples	additional analysis
Date samples received	19/07/2022
Date completed instructions received	01/08/2022

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

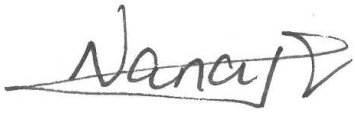
Date results requested by	08/08/2022
Date of Issue	08/08/2022

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

Asbestos Approved By
Analysed by Asbestos Approved Analyst: Lucy Zhu
Authorised by Asbestos Approved Signatory: Lucy Zhu
Results Approved By
Lucy Zhu, Asbestos Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

Asbestos ID - soils NEPM - ASB-001						
Our Reference		300836-D-1	300836-D-103	300836-D-104	300836-D-105	300836-D-106
Your Reference	UNITS	BH4	BH101	BH102	BH103	BH104
Depth		0.04-0.3	0-0.1	0-0.1	0-0.1	0-0.2
Date Sampled		12/07/2022	13/07/2022	13/07/2022	13/07/2022	13/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	08/08/2022	08/08/2022	08/08/2022	08/08/2022	08/08/2022
Sample mass tested	g	982.01	609.52	747.29	842.46	995.07
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos#1	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–	–	–	–
FA and AF Estimation*	g	–	–	–	–	–
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01	<0.01	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

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.

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

Report Comments

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

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SAMPLE RECEIPT ADVICE

Client Details

Client	JK Environments
Attention	Alistair Mitchell

Sample Login Details

Your reference	E35073B, Paramatta
Envirolab Reference	300836-D
Date Sample Received	19/07/2022
Date Instructions Received	01/08/2022
Date Results Expected to be Reported	08/08/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	additional analysis
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	10
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	Asbestos ID - soils NEPM - ASB-001	On Hold
BH4-0.04-0.3	✓	
BH4-0.5-0.95		✓
BH4-1.3-1.5		✓
BH5-0.04-0.3		✓
BH5-0.5-0.95		✓
BH6-0-0.2		✓
BH6-0.5-0.8		✓
BH7-0-0.1		✓
BH7-0.5-0.7		✓
BH7-1.0-1.2		✓
BH8-0.1-0.3		✓
BH8-0.7-0.9		✓
BH101 -0.1-0.3		✓
BH101-0.4-0.5		✓
BH102 -0.1-0.3		✓
BH102-0.4-0.6		✓
BH103-0.1-0.3		✓
BH103-0.5-0.6		✓
BH104-0.4-0.6		✓
BH105-0.02-0.1		✓
BH105-0.2-0.3		✓
BH105-1.0-1.1		✓
BH106-0.02-0.1		✓
BH106-0.1-0.3		✓
BH106-1.1-1.3		✓
BH107-0-0.1		✓
BH107-0.1-0.3		✓
BH107-0.3-0.45		✓
BH108-0-0.1		✓
BH108-0.1-0.3		✓
BH108-0.5-0.95		✓
BH108-1.5-1.6		✓

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Sample ID	Asbestos ID - soils NEPM - ASB-001	On Hold
BH109-0.015-0.1		✓
BH109-0.1-0.3		✓
BH109-0.4-0.6		✓
BH110-0.04-0.10		✓
BH110-0.1-0.3		✓
BH110-0.5-0.7		✓
BH111-0-0.1		✓
BH111-0.1-0.3		✓
BH111-0.4-0.6		✓
BH113-0-0.1		✓
BH113-0.1-0.3		✓
BH113-0.5-0.7		✓
BH114-0-0.1		✓
BH114-0.1-0.2		✓
BH114-0.3-0.5		✓
BH115-0-0.15		✓
BH115-0.3-0.5		✓
BH115-0.95-1.0		✓
BH116-0-0.1		✓
BH116-0.1-0.3		✓
BH116-0.5-0.6		✓
BH117-0-0.1		✓
BH117-0.1-0.2		✓
BH117-0.3-0.5		✓
BH118-0-0.1		✓
BH118-0.1-0.2		✓
BH118-0.3-0.5		✓
BH119-0-0.15		✓
BH119-0.3-0.5		✓
BH119-1.0-1.1		✓
BH120-0-0.1		✓
BH120-0.2-0.4		✓

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Sample ID	Asbestos ID - soils NEPM - ASB-001	On Hold
BH120-0.5-0.7		✓
BH121-0-0.1		✓
BH121-0.1-0.2		✓
BH121-0.4-0.6		✓
BH122-0-0.1		✓
BH122-0.1-0.3		✓
BH122-0.5-0.7		✓
SDUP3		✓
SDUP5 -		✓
SDUP6		✓
SDUP7		✓
SDUP8		✓
SDUP9		✓
TB-S2		✓
TS-S2		✓
FR-S2-SPT		✓
FR-S2-HA		✓
FCF1-BH116-0-0.1		✓
FCF2-BH116-0-0.1		✓
FCF3-BH116-0-0.1		✓
FCF1-BH118-0-0.1		✓
FCF2-BH118-0-0.1		✓
FCF1-BH120-0-0.1		✓
FCF2-BH120-0-0.1		✓
FCF3-BH120-0.1-0.4		✓
FCF4-BH120-0.1-0.4		✓
FCF1-BH121-0-0.1		✓
FCF1-BH122-0-0.1		✓
FCF2-BH122-0-0.1		✓
FCF3-BH122-0-0.1		✓
BH6-1.7-2.0		✓
BH6-2.7-3.0		✓

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Sample ID	Asbestos ID - soils NEPM - ASB-001	On Hold
BH7 -2.8-3.0		✓
BH7-3.3-3.6		✓
BH8 -1.7-2.0		✓
BH8-2.6-2.8		✓
BH8-3.5-3.7		✓
BH108-1.6-1.65		✓
BH101-0-0.1	✓	
BH102-0-0.1	✓	
BH103-0-0.1	✓	
BH104-0-0.2	✓	
BH109 - [TRIPLICATE]-0.015-0.1		✓

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

Additional Info

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

Ming To

Ref: 300836-D
TAT: Standard
Due: 08/08/2022
MT

From: Aileen Hie
Sent: Monday, 1 August 2022 2:44 PM
To: Ming To
Subject: FW: Sample Receipt for 300587-B E35073B, Parramatta East

Categories: Additional

From: Alistair Mitchell <AMitchell@jkenvironments.com.au>
Sent: Monday, 1 August 2022 2:42 PM
To: Aileen Hie <AHie@envirolab.com.au>
Subject: RE: Sample Receipt for 300587-B E35073B, Parramatta East

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Hey Aileen,

Can I get some extra additional asbestos WA 500ml method testing on the following samples:

7 • 300587 - BH4 (0.04-0.3); 300836-1
13 • 300587 - BH101 (0-0.1); 300836-103
16 • 300587 - BH102 (0-0.1); 300836-104
19 • 300587 - BH103 (0-0.1); and 300836-105
22 • 300587 - BH104 (0-0.2). 300836-106.

Thanks,

Regards
Alistair Mitchell
Environmental Scientist

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D: 0421 687 953
E: AMitchell@jkenvironments.com.au
www.jkenvironments.com.au

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From: Aileen Hie <AHie@envirolab.com.au>
Sent: Friday, 29 July 2022 5:40 PM
To: Vittal Boggaram <VBoggaram@jkenvironments.com.au>; Alistair Mitchell <AMitchell@jkenvironments.com.au>
Subject: Sample Receipt for 300587-B E35073B, Parramatta East

Please refer to attached for:

Ming To

From: Alistair Mitchell <AMitchell@jkenvironments.com.au> 300836-D.
Sent: Monday, 1 August 2022 3:45 PM
To: Ming To
Subject: RE: Sample Receipt for 300587-B E35073B, Parramatta East
Attachments: 285674-COC.pdf

Categories: Additional

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Hi Ming,

Thanks for responding so quickly.

The below samples I am hoping were sent to you but it could been within the job 300836 or could have been sent to Melbourne.

The attached COC seems to have them labelled so I hoping they are somewhere.

Thanks,

Regards
Alistair Mitchell
Environmental Scientist

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From: Ming To <MTo@envirolab.com.au>
Sent: Monday, 1 August 2022 3:02 PM
To: Alistair Mitchell <AMitchell@jkenvironments.com.au>
Cc: Aileen Hie <AHie@envirolab.com.au>
Subject: RE: Sample Receipt for 300587-B E35073B, Parramatta East

Hi Alistair,

According to our record, we did not receive any 500mL bag for the samples you have listed below.
Would you have the 500mL bags to send in or shall we test for asbestos ID instead?

Thanks,

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CERTIFICATE OF ANALYSIS 300836-E

Client Details

Client	JK Environments
Attention	Alistair Mitchell
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E35073B, Paramatta**
Number of Samples	additional analysis
Date samples received	19/07/2022
Date completed instructions received	22/08/2022

Analysis Details

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

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

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

Report Details

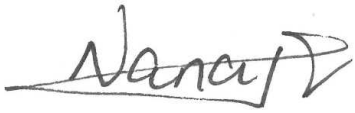
Date results requested by	29/08/2022
Date of Issue	29/08/2022

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Results Approved By
Diego Bigolin, Inorganics Supervisor
Giovanni Agosti, Group Technical Manager

Authorised By



Nancy Zhang, Laboratory Manager

CEC			
Our Reference		300836-E-9	300836-E-12
Your Reference	UNITS	BH7	BH8
Depth		0.5-0.7	0.7-0.9
Date Sampled		15/07/2022	15/07/2022
Type of sample		Soil	Soil
Date prepared	-	29/08/2022	29/08/2022
Date analysed	-	29/08/2022	29/08/2022
Exchangeable Ca	meq/100g	4.3	0.6
Exchangeable K	meq/100g	<0.1	0.2
Exchangeable Mg	meq/100g	2.6	7.0
Exchangeable Na	meq/100g	<0.1	0.5
Cation Exchange Capacity	meq/100g	7.1	8.3

Texture and Salinity*			
Our Reference		300836-E-9	300836-E-12
Your Reference	UNITS	BH7	BH8
Depth		0.5-0.7	0.7-0.9
Date Sampled		15/07/2022	15/07/2022
Type of sample		Soil	Soil
Date prepared	-	26/07/2022	26/07/2022
Date analysed	-	26/07/2022	26/07/2022
Electrical Conductivity 1:5 soil:water	µS/cm	44	41
Texture Value	-	9.0	7.0
Texture	-	CLAY LOAM	MEDIUM CLAY
ECe	dS/m	<2	<2
Class	-	NON SALINE	NON SALINE

Method ID	Methodology Summary
Inorg-002	Conductivity and Salinity - measured using a conductivity cell at 25°C in accordance with APHA latest edition 2510 and Rayment & Lyons.
INORG-123	Determined using a "Texture by Feel" method.
Metals-020	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-OES analytical finish.

QUALITY CONTROL: CEC					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			29/08/2022	[NT]	[NT]	[NT]	[NT]	29/08/2022	[NT]
Date analysed	-			29/08/2022	[NT]	[NT]	[NT]	[NT]	29/08/2022	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	105	[NT]

QUALITY CONTROL: Texture and Salinity*					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			26/07/2022	[NT]	[NT]	[NT]	[NT]	26/07/2022	[NT]
Date analysed	-			26/07/2022	[NT]	[NT]	[NT]	[NT]	26/07/2022	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	<1	[NT]	[NT]	[NT]	[NT]	97	[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	Alistair Mitchell

Sample Login Details

Your reference	E35073B, Paramatta
Envirolab Reference	300836-E
Date Sample Received	19/07/2022
Date Instructions Received	22/08/2022
Date Results Expected to be Reported	29/08/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	additional analysis
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	10
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	CEC	Texture and Salinity*	On Hold
BH4-0.04-0.3			✓
BH4-0.5-0.95			✓
BH4-1.3-1.5			✓
BH5-0.04-0.3			✓
BH5-0.5-0.95			✓
BH6-0-0.2			✓
BH6-0.5-0.8			✓
BH7-0-0.1			✓
BH7-0.5-0.7	✓	✓	
BH7-1.0-1.2			✓
BH8-0.1-0.3			✓
BH8-0.7-0.9	✓	✓	
BH101 -0.1-0.3			✓
BH101-0.4-0.5			✓
BH102 -0.1-0.3			✓
BH102-0.4-0.6			✓
BH103-0.1-0.3			✓
BH103-0.5-0.6			✓
BH104-0.4-0.6			✓
BH105-0.02-0.1			✓
BH105-0.2-0.3			✓
BH105-1.0-1.1			✓
BH106-0.02-0.1			✓
BH106-0.1-0.3			✓
BH106-1.1-1.3			✓
BH107-0-0.1			✓
BH107-0.1-0.3			✓
BH107-0.3-0.45			✓
BH108-0-0.1			✓
BH108-0.1-0.3			✓
BH108-0.5-0.95			✓
BH108-1.5-1.6			✓

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Sample ID	CEC	Texture and Salinity*	On Hold
BH109-0.015-0.1			✓
BH109-0.1-0.3			✓
BH109-0.4-0.6			✓
BH110-0.04-0.10			✓
BH110-0.1-0.3			✓
BH110-0.5-0.7			✓
BH111-0-0.1			✓
BH111-0.1-0.3			✓
BH111-0.4-0.6			✓
BH113-0-0.1			✓
BH113-0.1-0.3			✓
BH113-0.5-0.7			✓
BH114-0-0.1			✓
BH114-0.1-0.2			✓
BH114-0.3-0.5			✓
BH115-0-0.15			✓
BH115-0.3-0.5			✓
BH115-0.95-1.0			✓
BH116-0-0.1			✓
BH116-0.1-0.3			✓
BH116-0.5-0.6			✓
BH117-0-0.1			✓
BH117-0.1-0.2			✓
BH117-0.3-0.5			✓
BH118-0-0.1			✓
BH118-0.1-0.2			✓
BH118-0.3-0.5			✓
BH119-0-0.15			✓
BH119-0.3-0.5			✓
BH119-1.0-1.1			✓
BH120-0-0.1			✓
BH120-0.2-0.4			✓

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Sample ID	CEC	Texture and Salinity*	On Hold
BH120-0.5-0.7			✓
BH121-0-0.1			✓
BH121-0.1-0.2			✓
BH121-0.4-0.6			✓
BH122-0-0.1			✓
BH122-0.1-0.3			✓
BH122-0.5-0.7			✓
SDUP3			✓
SDUP5 -			✓
SDUP6			✓
SDUP7			✓
SDUP8			✓
SDUP9			✓
TB-S2			✓
TS-S2			✓
FR-S2-SPT			✓
FR-S2-HA			✓
FCF1-BH116-0-0.1			✓
FCF2-BH116-0-0.1			✓
FCF3-BH116-0-0.1			✓
FCF1-BH118-0-0.1			✓
FCF2-BH118-0-0.1			✓
FCF1-BH120-0-0.1			✓
FCF2-BH120-0-0.1			✓
FCF3-BH120-0.1-0.4			✓
FCF4-BH120-0.1-0.4			✓
FCF1-BH121-0-0.1			✓
FCF1-BH122-0-0.1			✓
FCF2-BH122-0-0.1			✓
FCF3-BH122-0-0.1			✓
BH6-1.7-2.0			✓
BH6-2.7-3.0			✓

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Sample ID	CEC	Texture and Salinity*	On Hold
BH7 -2.8-3.0			✓
BH7-3.3-3.6			✓
BH8 -1.7-2.0			✓
BH8-2.6-2.8			✓
BH8-3.5-3.7			✓
BH108-1.6-1.65			✓

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: Greta Petzold
Sent: Monday, 22 August 2022 3:27 PM
To: Alistair Mitchell; Samplereceipt
Subject: RE: Results for Registration 300587-B E35073B, Parramatta East

Categories: Additional

Ref: 300836-E
TAT: Standard.
Due: 29/08/2022
MT

Hi Alistair,

No worries, we'll get that booked in for you.

Cheers

Kind Regards,

Greta Petzold | Assistant Operations Manager | Envirolab Services

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

From: Alistair Mitchell <AMitchell@jkenvironments.com.au>
Sent: Monday, 22 August 2022 3:20 PM
To: Greta Petzold <GPetzold@envirolab.com.au>
Subject: RE: Results for Registration 300587-B E35073B, Parramatta East

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 Greta,

Can I get additional salinity CEC testing for the following samples please?

- Job number 300587- E35073B, BH1 (0.5-0.7);
- Job number 300587- E35073B, BH3 (0.4-0.5);
- Job number 300836-A- E35073B, BH7 (0.5-0.7); and 9
- Job number 300836-A - E35073B, BH8 (0.7-0.9). 12.

Thanks,

Regards
Alistair Mitchell
Environmental Scientist

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D: 0421 687 953
E: AMitchell@jkenvironments.com.au
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CERTIFICATE OF ANALYSIS 301048

Client Details

Client	JK Environments
Attention	Alistair Mitchell
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E35073B, Parramatta**
Number of Samples	4 Soil
Date samples received	21/07/2022
Date completed instructions received	21/07/2022

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	28/07/2022
Date of Issue	28/07/2022

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

Results Approved By
Giovanni Agosti, Group Technical Manager
Josh Williams, Organics and LC Supervisor
Liam Timmins, Organic Instruments Team Leader
Lucy Zhu, Asbestos Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil			
Our Reference		301048-1	301048-3
Your Reference	UNITS	BH123	BH124
Depth		0-0.1	0-0.1
Date Sampled		20/07/2022	20/07/2022
Type of sample		Soil	Soil
Date extracted	-	23/07/2022	23/07/2022
Date analysed	-	25/07/2022	25/07/2022
TRH C_6 - C_9	mg/kg	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25
vTPH 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 +ve Xylenes	mg/kg	<1	<1
Surrogate aaa-Trifluorotoluene	%	63	83

svTRH (C10-C40) in Soil			
Our Reference		301048-1	301048-3
Your Reference	UNITS	BH123	BH124
Depth		0-0.1	0-0.1
Date Sampled		20/07/2022	20/07/2022
Type of sample		Soil	Soil
Date extracted	-	22/07/2022	22/07/2022
Date analysed	-	23/07/2022	23/07/2022
TRH C_{10} - C_{14}	mg/kg	84	<50
TRH C_{15} - C_{28}	mg/kg	500	<100
TRH C_{29} - C_{36}	mg/kg	320	<100
Total +ve TRH (C10-C36)	mg/kg	900	<50
TRH >C_{10} -C_{16}	mg/kg	240	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	240	<50
TRH >C_{16} -C_{34}	mg/kg	540	<100
TRH >C_{34} -C_{40}	mg/kg	250	<100
Total +ve TRH (>C10-C40)	mg/kg	1,000	<50
Surrogate o-Terphenyl	%	107	97

PAHs in Soil			
Our Reference		301048-1	301048-3
Your Reference	UNITS	BH123	BH124
Depth		0-0.1	0-0.1
Date Sampled		20/07/2022	20/07/2022
Type of sample		Soil	Soil
Date extracted	-	22/07/2022	22/07/2022
Date analysed	-	22/07/2022	22/07/2022
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	0.2	0.2
Pyrene	mg/kg	0.2	0.2
Benzo(a)anthracene	mg/kg	0.2	<0.1
Chrysene	mg/kg	0.3	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	0.6	<0.2
Benzo(a)pyrene	mg/kg	0.2	0.09
Indeno(1,2,3-c,d)pyrene	mg/kg	0.2	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.2	<0.1
Total +ve PAH's	mg/kg	2.1	0.51
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	%	131	126

Organochlorine Pesticides in soil			
Our Reference		301048-1	301048-3
Your Reference	UNITS	BH123	BH124
Depth		0-0.1	0-0.1
Date Sampled		20/07/2022	20/07/2022
Type of sample		Soil	Soil
Date extracted	-	22/07/2022	22/07/2022
Date analysed	-	22/07/2022	22/07/2022
alpha-BHC	mg/kg	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1
Surrogate TCMX	%	132	124

Organophosphorus Pesticides in Soil			
Our Reference		301048-1	301048-3
Your Reference	UNITS	BH123	BH124
Depth		0-0.1	0-0.1
Date Sampled		20/07/2022	20/07/2022
Type of sample		Soil	Soil
Date extracted	-	22/07/2022	22/07/2022
Date analysed	-	22/07/2022	22/07/2022
Dichlorvos	mg/kg	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1
Surrogate TCMX	%	132	124

PCBs in Soil			
Our Reference		301048-1	301048-3
Your Reference	UNITS	BH123	BH124
Depth		0-0.1	0-0.1
Date Sampled		20/07/2022	20/07/2022
Type of sample		Soil	Soil
Date extracted	-	22/07/2022	22/07/2022
Date analysed	-	22/07/2022	22/07/2022
Aroclor 1016	mg/kg	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1
Surrogate TCMX	%	132	124

Acid Extractable metals in soil			
Our Reference		301048-1	301048-3
Your Reference	UNITS	BH123	BH124
Depth		0-0.1	0-0.1
Date Sampled		20/07/2022	20/07/2022
Type of sample		Soil	Soil
Date prepared	-	26/07/2022	26/07/2022
Date analysed	-	27/07/2022	27/07/2022
Arsenic	mg/kg	4	9
Cadmium	mg/kg	<0.4	<0.4
Chromium	mg/kg	10	18
Copper	mg/kg	20	7
Lead	mg/kg	23	57
Mercury	mg/kg	<0.1	<0.1
Nickel	mg/kg	3	3
Zinc	mg/kg	98	73

Moisture			
Our Reference		301048-1	301048-3
Your Reference	UNITS	BH123	BH124
Depth		0-0.1	0-0.1
Date Sampled		20/07/2022	20/07/2022
Type of sample		Soil	Soil
Date prepared	-	22/07/2022	22/07/2022
Date analysed	-	25/07/2022	25/07/2022
Moisture	%	53	37

Asbestos ID - soils NEPM - ASB-001			
Our Reference		301048-1	301048-3
Your Reference	UNITS	BH123	BH124
Depth		0-0.1	0-0.1
Date Sampled		20/07/2022	20/07/2022
Type of sample		Soil	Soil
Date analysed	-	27/07/2022	27/07/2022
Sample mass tested	g	336.37	577.55
Sample Description	-	Brown fine-grained soil & debris	Brown fine-grained soil & debris
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected
Total Asbestos[#1]	g/kg	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–
FA and AF Estimation*	g	–	–
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001

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

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	301048-3
Date extracted	-			25/07/2022	1	23/07/2022	23/07/2022		23/07/2022	23/07/2022
Date analysed	-			26/07/2022	1	25/07/2022	25/07/2022		25/07/2022	25/07/2022
TRH C_6 - C_9	mg/kg	25	Org-023	<25	1	<25	<25	0	87	86
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	1	<25	<25	0	87	86
Benzene	mg/kg	0.2	Org-023	<0.2	1	<0.2	<0.2	0	94	89
Toluene	mg/kg	0.5	Org-023	<0.5	1	<0.5	<0.5	0	84	79
Ethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	83	72
m+p-xylene	mg/kg	2	Org-023	<2	1	<2	<2	0	88	77
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	89	78
Naphthalene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	92	1	63	63	0	85	92

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	301048-3
Date extracted	-			22/07/2022	1	22/07/2022	22/07/2022		22/07/2022	22/07/2022
Date analysed	-			23/07/2022	1	23/07/2022	23/07/2022		23/07/2022	23/07/2022
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	1	84	81	4	113	124
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	1	500	430	15	103	115
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	1	320	330	3	114	97
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	1	240	220	9	113	124
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	1	540	510	6	103	115
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	1	250	290	15	114	97
Surrogate o-Terphenyl	%		Org-020	91	1	107	108	1	92	98

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	301048-3
Date extracted	-			22/07/2022	1	22/07/2022	22/07/2022		22/07/2022	22/07/2022
Date analysed	-			22/07/2022	1	22/07/2022	22/07/2022		22/07/2022	22/07/2022
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	109	113
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	105	109
Fluorene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	109	113
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	122	124
Anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	1	0.2	0.1	67	114	110
Pyrene	mg/kg	0.1	Org-022/025	<0.1	1	0.2	0.2	0	119	121
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	0.2	0.2	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	1	0.3	0.1	100	107	109
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	1	0.6	0.3	67	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	1	0.2	0.1	67	78	112
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	1	0.2	<0.1	67	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	1	0.2	<0.1	67	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	117	1	131	126	4	123	126

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	301048-3
Date extracted	-			22/07/2022	1	22/07/2022	22/07/2022		22/07/2022	22/07/2022
Date analysed	-			22/07/2022	1	22/07/2022	22/07/2022		22/07/2022	22/07/2022
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	102	108
HCB	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	103	107
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	105	107
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	118	124
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	112	118
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	111	119
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	114	117
Endrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	98	105
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	94	106
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	96	106
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	117	1	132	131	1	121	125

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	301048-3
Date extracted	-			22/07/2022	1	22/07/2022	22/07/2022		22/07/2022	22/07/2022
Date analysed	-			22/07/2022	1	22/07/2022	22/07/2022		22/07/2022	22/07/2022
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	106	116
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	95	102
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	75	103
Malathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	114	123
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	108	122
Parathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	69	102
Bromophos-ethyl	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	90	121
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	117	1	132	131	1	121	125

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	301048-3
Date extracted	-			22/07/2022	1	22/07/2022	22/07/2022		22/07/2022	22/07/2022
Date analysed	-			22/07/2022	1	22/07/2022	22/07/2022		22/07/2022	22/07/2022
Aroclor 1016	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	78	80
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	117	1	132	131	1	121	125

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	301048-3
Date prepared	-			26/07/2022	1	26/07/2022	26/07/2022		26/07/2022	26/07/2022
Date analysed	-			27/07/2022	1	27/07/2022	27/07/2022		27/07/2022	27/07/2022
Arsenic	mg/kg	4	Metals-020	<4	1	4	<4	0	102	97
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	98	89
Chromium	mg/kg	1	Metals-020	<1	1	10	9	11	98	92
Copper	mg/kg	1	Metals-020	<1	1	20	18	11	99	107
Lead	mg/kg	1	Metals-020	<1	1	23	20	14	102	105
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	85	109
Nickel	mg/kg	1	Metals-020	<1	1	3	3	0	102	98
Zinc	mg/kg	1	Metals-020	<1	1	98	93	5	99	115

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.

Measurement Uncertainty estimates are available for most tests upon request.

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

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

Report Comments

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

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	Alistair Mitchell

Sample Login Details

Your reference	E35073B, Parramatta
Envirolab Reference	301048
Date Sample Received	21/07/2022
Date Instructions Received	21/07/2022
Date Results Expected to be Reported	28/07/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	4 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	4
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

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

Analysis Underway, details on the following page:

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Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBs in Soil	Acid Extractable metalsin soil	Asbestos ID - soils NEPM - ASB-001	On Hold
BH123-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	
BH123-0.5-0.8									✓
BH124-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	
BH124-0.2-0.5									✓

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: E35073B 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: Alistair Mitchell amitchell@jkenvironments.com.au

Location:	Parramatta	Sample Preserved in Esky on Ice
Sampler:	AD/NF	Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 2	Combo 3a	Combo 6	Asbestos (500ml WA method)	8 Metals	PAHs	TRH/BTEX	BTEX	Asbestos			
20/07/2022	1	BH123	0-0.1	G, A	0.1	F: Silty Sandy Clay			X	X								
20/07/2022	2	BH123	0.5-0.8	G, A	0.2	Silty Clay												
20/07/2022	3	BH124	0-0.1	G, A	0.1	F: Silty Clay			X	X								
20/07/2022	4	BH124	0.2-0.5	G, A	0.2	Silty Clay												

Remarks (comments/detection limits required):

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

30104 8

Relinquished By:	Date: 21.7.22	Time: 1540	Received By:	Date:
				21/7/22 1540

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CERTIFICATE OF ANALYSIS 301048-A

Client Details

Client	JK Environments
Attention	Alistair Mitchell
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E35073B, Parramatta**
Number of Samples	additional analysis
Date samples received	21/07/2022
Date completed instructions received	22/08/2022

Analysis Details

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

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

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

Report Details

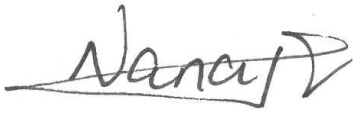
Date results requested by	29/08/2022
Date of Issue	29/08/2022

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Results Approved By
Kyle Gavrily, Senior Chemist

Authorised By



Nancy Zhang, Laboratory Manager

sTPH in Soil (C10-C40)-Silica		
Our Reference		301048-A-1
Your Reference	UNITS	BH123
Depth		0-0.1
Date Sampled		20/07/2022
Type of sample		Soil
Date extracted	-	25/08/2022
Date analysed	-	27/08/2022
TPH C_{10} - C_{14}	mg/kg	54
TPH C_{15} - C_{28}	mg/kg	170
TPH C_{29} - C_{36}	mg/kg	100
TPH >C_{10} -C_{16}	mg/kg	130
TPH >C_{16} -C_{34}	mg/kg	130
TPH >C_{34} -C_{40}	mg/kg	<100
Surrogate o-Terphenyl	%	121

Method ID	Methodology Summary
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.

QUALITY CONTROL: sTPH in Soil (C10-C40)-Silica						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-13	[NT]
Date extracted	-			25/08/2022	1	25/08/2022	25/08/2022		25/08/2022	[NT]
Date analysed	-			27/08/2022	1	27/08/2022	27/08/2022		27/08/2022	[NT]
TPH C_{10} - C_{14}	mg/kg	50	Org-020	<50	1	54	50	8	92	[NT]
TPH C_{15} - C_{28}	mg/kg	100	Org-020	<100	1	170	200	16	103	[NT]
TPH C_{29} - C_{36}	mg/kg	100	Org-020	<100	1	100	<100	0	78	[NT]
TPH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	1	130	160	21	92	[NT]
TPH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	1	130	110	17	103	[NT]
TPH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	1	<100	<100	0	78	[NT]
Surrogate o-Terphenyl	%		Org-020	97	1	121	120	1	120	[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	Alistair Mitchell

Sample Login Details

Your reference	E35073B, Parramatta
Envirolab Reference	301048-A
Date Sample Received	21/07/2022
Date Instructions Received	22/08/2022
Date Results Expected to be Reported	29/08/2022

Sample Condition

Samples received in appropriate condition for analysis	Holding time exceedance
No. of Samples Provided	additional analysis
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	4
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Please contact the laboratory within 24 hours if you wish to cancel the aformentioned testing. Otherwise testing will proceed as per the COC and hence invoiced accordingly.

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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customerservice@envirolab.com.au
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Sample ID	sTPH in Soil (C10-C40)-Silica	On Hold
BH123-0-0.1	✓	
BH123-0.5-0.8		✓
BH124-0-0.1		✓
BH124-0.2-0.5		✓

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: Greta Petzold
Sent: Monday, 22 August 2022 11:45 AM
To: Alistair Mitchell; Samplereceipt
Subject: RE: Results for Registration 301048 E35073B, Parramatta

Categories: Additional

Ref: 301048-A
TAT: Standard
Due: 29/08/2022
MT

Hi Alistair,

No worries, we can get that organised for you.

Cheers

Kind Regards,

Greta Petzold | Assistant Operations Manager | Envirolab Services

Great Science. Great Service.

12 Ashley Street Chatswood NSW 2067
T: 61 2 9910 6200
E: GPetzold@envirolab.com.au | W www.envirolab.com.au

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

From: Alistair Mitchell <AMitchell@jkenvironments.com.au>
Sent: Monday, 22 August 2022 11:41 AM
To: Greta Petzold <GPetzold@envirolab.com.au>
Subject: RE: Results for Registration 301048 E35073B, Parramatta

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 Greta,

Would I be able to get some additional silica gel >C10-C16 (F2) clean up testing for the following sample?

- BH123 0-0.1. (1)

Thanks,

Regards
Alistair Mitchell
Environmental Scientist

T: +612 9888 5000
D: 0421 687 953
E: AMitchell@jkenvironments.com.au
www.jkenvironments.com.au

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

JKEnvironments

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www.envirolab.com.au

CERTIFICATE OF ANALYSIS 301640

Client Details

Client	JK Environments
Attention	Alistair Mitchell
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E35073B, Parramatta**
Number of Samples	8 Water
Date samples received	28/07/2022
Date completed instructions received	28/07/2022

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

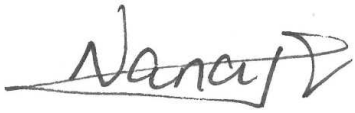
Date results requested by	05/08/2022
Date of Issue	05/08/2022

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Results Approved By
Giovanni Agosti, Group Technical Manager
Josh Williams, Organics and LC Supervisor
Phalak Inthakesone, Organics Development Manager, Sydney
Priya Samarawickrama, Senior Chemist
Steven Luong, Senior Chemist

Authorised By



Nancy Zhang, Laboratory Manager

VOCs in water					
Our Reference		301640-1	301640-2	301640-3	301640-4
Your Reference	UNITS	MW1	MW3	MW6	WDUP1
Date Sampled		27/07/2022	27/07/2022	27/07/2022	27/07/2022
Type of sample		Water	Water	Water	Water
Date extracted	-	29/07/2022	29/07/2022	29/07/2022	29/07/2022
Date analysed	-	31/07/2022	31/07/2022	31/07/2022	31/07/2022
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	<1	<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	<1	<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	301640-1	301640-2	301640-3	301640-4
Your Reference		MW1	MW3	MW6	WDUP1
Date Sampled		27/07/2022	27/07/2022	27/07/2022	27/07/2022
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	%	91	90	92	91
Surrogate toluene-d8	%	95	96	97	96
Surrogate 4-BFB	%	104	104	101	101

PFAS in Waters Trace Extended					
Our Reference		301640-1	301640-2	301640-3	301640-4
Your Reference	UNITS	MW1	MW3	MW6	WDUP1
Date Sampled		27/07/2022	27/07/2022	27/07/2022	27/07/2022
Type of sample		Water	Water	Water	Water
Date prepared	-	04/08/2022	04/08/2022	04/08/2022	04/08/2022
Date analysed	-	04/08/2022	04/08/2022	04/08/2022	04/08/2022
Perfluorobutanesulfonic acid	µg/L	0.0097	0.003	0.003	0.010
Perfluoropentanesulfonic acid	µg/L	0.004	0.001	<0.001	0.005
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.0043	0.0033	0.0048	0.0031
Perfluoroheptanesulfonic acid	µg/L	<0.001	<0.001	<0.001	<0.001
Perfluorooctanesulfonic acid PFOS	µg/L	0.002	0.001	0.0047	0.001
Perfluorodecanesulfonic acid	µg/L	<0.002	<0.002	<0.002	<0.002
Perfluorobutanoic acid	µg/L	<0.002	<0.002	<0.002	<0.002
Perfluoropentanoic acid	µg/L	0.002	<0.002	<0.002	0.002
Perfluorohexanoic acid	µg/L	0.002	<0.0004	<0.0004	0.002
Perfluoroheptanoic acid	µg/L	0.0006	<0.0004	<0.0004	0.0004
Perfluorooctanoic acid PFOA	µg/L	0.001	0.0006	0.002	0.0009
Perfluorononanoic acid	µg/L	<0.001	<0.001	<0.001	<0.001
Perfluorodecanoic acid	µg/L	<0.002	<0.002	<0.002	<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	<0.005	<0.005	<0.005	<0.005
N-Ethyl perfluorooctanesulfon amide	µg/L	<0.01	<0.01	<0.01	<0.01
N-Me perfluorooctanesulfonamid oethanol	µg/L	<0.005	<0.005	<0.005	<0.005
N-Et perfluorooctanesulfonamid oethanol	µg/L	<0.05	<0.05	<0.05	<0.05
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*	%	109	115	109	104
Surrogate $^{13}C_2$ *PFOA*	%	105	107	103	103
Extracted ISTD $^{13}C_3$ *PFBS*	%	77	77	86	77
Extracted ISTD $^{18}O_2$ *PFHxS*	%	84	88	88	83
Extracted ISTD $^{13}C_4$ *PFOS*	%	80	80	83	92
Extracted ISTD $^{13}C_4$ *PFBA*	%	#	57	#	#

PFAS in Waters Trace Extended					
Our Reference		301640-1	301640-2	301640-3	301640-4
Your Reference	UNITS	MW1	MW3	MW6	WDUP1
Date Sampled		27/07/2022	27/07/2022	27/07/2022	27/07/2022
Type of sample		Water	Water	Water	Water
Extracted ISTD $^{13}C_3$ *PFPeA*	%	31	75	39	29
Extracted ISTD $^{13}C_2$ *PFHxA*	%	68	105	86	71
Extracted ISTD $^{13}C_4$ *PFHpA*	%	84	92	88	85
Extracted ISTD $^{13}C_4$ *PFOA*	%	89	87	93	91
Extracted ISTD $^{13}C_5$ *PFNA*	%	102	100	106	103
Extracted ISTD $^{13}C_2$ *PFDA*	%	98	100	108	102
Extracted ISTD $^{13}C_2$ *PFUnDA*	%	86	82	93	86
Extracted ISTD $^{13}C_2$ *PFDoDA*	%	87	83	94	92
Extracted ISTD $^{13}C_2$ *PFTeDA*	%	93	71	90	96
Extracted ISTD $^{13}C_2$ *4:2FTS*	%	92	126	95	89
Extracted ISTD $^{13}C_2$ *6:2FTS*	%	130	110	116	133
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	144	124	147	146
Extracted ISTD $^{13}C_8$ *FOSA*	%	61	61	49	62
Extracted ISTD d_3 *N MeFOSA*	%	36	32	#	33
Extracted ISTD d_5 *N EtFOSA*	%	38	31	#	32
Extracted ISTD d_7 *N MeFOSE*	%	50	50	30	52
Extracted ISTD d_9 *N EtFOSE*	%	49	52	35	53
Extracted ISTD d_3 *N MeFOSAA*	%	102	53	96	92
Extracted ISTD d_5 *N EtFOSAA*	%	113	43	111	106
Total Positive PFHxS & PFOS	µg/L	0.0060	0.0046	0.0095	0.0046
Total Positive PFOS & PFOA	µg/L	0.0030	0.002	0.0062	0.0024
Total Positive PFAS	µg/L	0.025	0.0094	0.014	0.025

vTRH(C6-C10)/BTEXN in Water						
Our Reference		301640-1	301640-2	301640-3	301640-4	301640-6
Your Reference	UNITS	MW1	MW3	MW6	WDUP1	TB-W1
Date Sampled		27/07/2022	27/07/2022	27/07/2022	27/07/2022	27/07/2022
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	29/07/2022	29/07/2022	29/07/2022	29/07/2022	29/07/2022
Date analysed	-	31/07/2022	31/07/2022	31/07/2022	31/07/2022	31/07/2022
TRH C_6 - C_9	µg/L	<10	<10	<10	<10	38
TRH C_6 - C_{10}	µg/L	<10	<10	<10	<10	38
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10	<10	<10	<10	38
Benzene	µg/L	<1	<1	<1	<1	<1
Toluene	µg/L	<1	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2	<2	<2
o-xylene	µg/L	<1	<1	<1	<1	<1
Naphthalene	µg/L	<1	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	91	90	92	91	94
Surrogate toluene-d8	%	95	96	97	96	98
Surrogate 4-BFB	%	104	104	101	101	102

vTRH(C6-C10)/BTEXN in Water			
Our Reference		301640-7	301640-8
Your Reference	UNITS	TS-W1	FR
Date Sampled		27/07/2022	27/07/2022
Type of sample		Water	Water
Date extracted	-	29/07/2022	29/07/2022
Date analysed	-	31/07/2022	31/07/2022
TRH C_6 - C_9	µg/L	[NA]	70
TRH C_6 - C_{10}	µg/L	[NA]	70
TRH C_6 - C_{10} less BTEX (F1)	µg/L	[NA]	70
Benzene	µg/L	110%	<1
Toluene	µg/L	105%	<1
Ethylbenzene	µg/L	118%	<1
m+p-xylene	µg/L	115%	<2
o-xylene	µg/L	113%	<1
Naphthalene	µg/L	[NA]	<1
Surrogate Dibromofluoromethane	%	92	94
Surrogate toluene-d8	%	98	97
Surrogate 4-BFB	%	99	102

svTRH (C10-C40) in Water					
Our Reference	UNITS	301640-1	301640-2	301640-3	301640-4
Your Reference		MW1	MW3	MW6	WDUP1
Date Sampled		27/07/2022	27/07/2022	27/07/2022	27/07/2022
Type of sample		Water	Water	Water	Water
Date extracted	-	30/07/2022	30/07/2022	30/07/2022	30/07/2022
Date analysed	-	31/07/2022	31/07/2022	31/07/2022	31/07/2022
TRH C_{10} - C_{14}	µg/L	<50	<50	<50	<50
TRH C_{15} - C_{28}	µg/L	<100	<100	<100	<100
TRH C_{29} - C_{36}	µg/L	<100	<100	<100	<100
Total +ve TRH (C10-C36)	µg/L	<50	<50	<50	<50
TRH >C_{10} - C_{16}	µg/L	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50	<50	<50	<50
TRH >C_{16} - C_{34}	µg/L	<100	<100	<100	<100
TRH >C_{34} - C_{40}	µg/L	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	µg/L	<50	<50	<50	<50
Surrogate o-Terphenyl	%	79	86	89	69

PAHs in Water - Low Level					
Our Reference	UNITS	301640-1	301640-2	301640-3	301640-4
Your Reference		MW1	MW3	MW6	WDUP1
Date Sampled		27/07/2022	27/07/2022	27/07/2022	27/07/2022
Type of sample		Water	Water	Water	Water
Date extracted	-	30/07/2022	30/07/2022	30/07/2022	30/07/2022
Date analysed	-	01/08/2022	01/08/2022	01/08/2022	01/08/2022
Naphthalene	µg/L	<0.2	<0.2	<0.2	<0.2
Acenaphthylene	µg/L	<0.1	<0.1	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1	<0.1	<0.1
Fluoranthene	µg/L	0.2	0.2	0.2	0.2
Pyrene	µg/L	0.2	0.1	0.2	0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	<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
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	µg/L	0.38	0.30	0.38	0.32
Surrogate p-Terphenyl-d14	%	98	98	100	93

HM in water - dissolved					
Our Reference		301640-1	301640-2	301640-3	301640-4
Your Reference	UNITS	MW1	MW3	MW6	WDUP1
Date Sampled		27/07/2022	27/07/2022	27/07/2022	27/07/2022
Type of sample		Water	Water	Water	Water
Date prepared	-	02/08/2022	02/08/2022	02/08/2022	02/08/2022
Date analysed	-	02/08/2022	02/08/2022	02/08/2022	02/08/2022
Arsenic-Dissolved	µg/L	<1	<1	<1	<1
Cadmium-Dissolved	µg/L	<0.1	<0.1	<0.1	<0.1
Chromium-Dissolved	µg/L	<1	<1	<1	<1
Copper-Dissolved	µg/L	2	1	1	2
Lead-Dissolved	µg/L	<1	<1	<1	<1
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05	<0.05
Nickel-Dissolved	µg/L	3	<1	13	3
Zinc-Dissolved	µg/L	14	6	71	14

Miscellaneous Inorganics				
Our Reference	UNITS	301640-1	301640-2	301640-3
Your Reference		MW1	MW3	MW6
Date Sampled		27/07/2022	27/07/2022	27/07/2022
Type of sample		Water	Water	Water
Date prepared	-	28/07/2022	28/07/2022	28/07/2022
Date analysed	-	28/07/2022	28/07/2022	28/07/2022
pH	pH Units	5.3	5.2	5.6
Electrical Conductivity	µS/cm	1,300	200	1,400
Chloride, Cl	mg/L	130	27	510
Sulphate, SO4	mg/L	340	35	87

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.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Waters samples are filtered on receipt prior to analysis. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Metals-022	Determination of various metals by ICP-MS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
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 5.3 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-W7	[NT]
Date extracted	-			29/07/2022	1	29/07/2022	01/08/2022		29/07/2022	[NT]
Date analysed	-			31/07/2022	1	31/07/2022	02/08/2022		31/07/2022	[NT]
Dichlorodifluoromethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Chloromethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Bromomethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Chloroethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	98	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Chloroform	µg/L	1	Org-023	<1	1	<1	<1	0	106	[NT]
2,2-dichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	106	[NT]
1,1,1-trichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	95	[NT]
1,1-dichloropropene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Cyclohexane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Dibromomethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Trichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	109	[NT]
Bromodichloromethane	µg/L	1	Org-023	<1	1	<1	<1	0	96	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Toluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,3-dichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-023	<1	1	<1	<1	0	89	[NT]
1,2-dibromoethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	108	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Bromoform	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
m+p-xylene	µg/L	2	Org-023	<2	1	<2	<2	0	[NT]	[NT]
Styrene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]

QUALITY CONTROL: VOCs in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W7	[NT]
o-xylene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,3-trichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Isopropylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Bromobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
n-propyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,3,5-trimethyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Tert-butyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,4-trimethyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Sec-butyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
4-isopropyl toluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
n-butyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	93	1	91	93	2	97	[NT]
Surrogate toluene-d8	%		Org-023	97	1	95	97	2	100	[NT]
Surrogate 4-BFB	%		Org-023	105	1	104	104	0	107	[NT]

QUALITY CONTROL: PFAS in Waters Trace Extended						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			04/08/2022	1	04/08/2022	04/08/2022		04/08/2022	[NT]
Date analysed	-			04/08/2022	1	04/08/2022	04/08/2022		04/08/2022	[NT]
Perfluorobutanesulfonic acid	µg/L	0.0004	Org-029	<0.0004	1	0.0097	0.010	3	105	[NT]
Perfluoropentanesulfonic acid	µg/L	0.001	Org-029	<0.001	1	0.004	0.004	0	104	[NT]
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.0002	Org-029	<0.0002	1	0.0043	0.0041	5	102	[NT]
Perfluoroheptanesulfonic acid	µg/L	0.001	Org-029	<0.001	1	<0.001	<0.001	0	107	[NT]
Perfluorooctanesulfonic acid PFOS	µg/L	0.0002	Org-029	<0.0002	1	0.002	0.001	67	114	[NT]
Perfluorodecanesulfonic acid	µg/L	0.002	Org-029	<0.002	1	<0.002	<0.002	0	82	[NT]
Perfluorobutanoic acid	µg/L	0.002	Org-029	<0.002	1	<0.002	<0.002	0	99	[NT]
Perfluoropentanoic acid	µg/L	0.002	Org-029	<0.002	1	0.002	0.002	0	102	[NT]
Perfluorohexanoic acid	µg/L	0.0004	Org-029	<0.0004	1	0.002	0.002	0	95	[NT]
Perfluoroheptanoic acid	µg/L	0.0004	Org-029	<0.0004	1	0.0006	<0.0004	40	99	[NT]
Perfluorooctanoic acid PFOA	µg/L	0.0002	Org-029	<0.0002	1	0.001	0.001	0	97	[NT]
Perfluorononanoic acid	µg/L	0.001	Org-029	<0.001	1	<0.001	<0.001	0	96	[NT]
Perfluorodecanoic acid	µg/L	0.002	Org-029	<0.002	1	<0.002	<0.002	0	96	[NT]
Perfluoroundecanoic acid	µg/L	0.002	Org-029	<0.002	1	<0.002	<0.002	0	106	[NT]
Perfluorododecanoic acid	µg/L	0.005	Org-029	<0.005	1	<0.005	<0.005	0	101	[NT]
Perfluorotridecanoic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	104	[NT]
Perfluorotetradecanoic acid	µg/L	0.05	Org-029	<0.05	1	<0.05	<0.05	0	103	[NT]
4:2 FTS	µg/L	0.001	Org-029	<0.001	1	<0.001	<0.001	0	104	[NT]
6:2 FTS	µg/L	0.0004	Org-029	<0.0004	1	<0.0004	<0.0004	0	107	[NT]
8:2 FTS	µg/L	0.0004	Org-029	<0.0004	1	<0.0004	<0.0004	0	106	[NT]
10:2 FTS	µg/L	0.002	Org-029	<0.002	1	<0.002	<0.002	0	108	[NT]
Perfluorooctane sulfonamide	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	101	[NT]
N-Methyl perfluorooctane sulfonamide	µg/L	0.005	Org-029	<0.005	1	<0.005	<0.005	0	92	[NT]
N-Ethyl perfluorooctanesulfon amide	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	88	[NT]
N-Me perfluorooctanesulfonamid oethanol	µg/L	0.005	Org-029	<0.005	1	<0.005	<0.005	0	103	[NT]
N-Et perfluorooctanesulfonamid oethanol	µg/L	0.05	Org-029	<0.05	1	<0.05	<0.05	0	106	[NT]
MePerfluorooctanesulf- amid oacetic acid	µg/L	0.002	Org-029	<0.002	1	<0.002	<0.002	0	101	[NT]
EtPerfluorooctanesulf- amid oacetic acid	µg/L	0.002	Org-029	<0.002	1	<0.002	<0.002	0	96	[NT]
Surrogate $^{13}C_8$ *PFOS*	%		Org-029	101	1	109	108	1	111	[NT]
Surrogate $^{13}C_2$ *PFOA*	%		Org-029	98	1	105	106	1	100	[NT]

QUALITY CONTROL: PFAS in Waters Trace Extended						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Extracted ISTD $^{13}C_3$ *PFBS*	%		Org-029	80	1	77	72	7	80	[NT]
Extracted ISTD $^{18}O_2$ *PFHxS*	%		Org-029	93	1	84	83	1	92	[NT]
Extracted ISTD $^{13}C_4$ *PFOS*	%		Org-029	91	1	80	78	3	85	[NT]
Extracted ISTD $^{13}C_4$ *PFBA*	%		Org-029	108	1	#	#		114	[NT]
Extracted ISTD $^{13}C_3$ *PFPeA*	%		Org-029	87	1	31	32	3	90	[NT]
Extracted ISTD $^{13}C_2$ *PFHxA*	%		Org-029	103	1	68	65	5	109	[NT]
Extracted ISTD $^{13}C_4$ *PFHpA*	%		Org-029	101	1	84	79	6	103	[NT]
Extracted ISTD $^{13}C_4$ *PFOA*	%		Org-029	99	1	89	83	7	101	[NT]
Extracted ISTD $^{13}C_5$ *PFNA*	%		Org-029	105	1	102	98	4	105	[NT]
Extracted ISTD $^{13}C_2$ *PFDA*	%		Org-029	105	1	98	92	6	104	[NT]
Extracted ISTD $^{13}C_2$ *PFUnDA*	%		Org-029	97	1	86	82	5	103	[NT]
Extracted ISTD $^{13}C_2$ *PFDoDA*	%		Org-029	100	1	87	82	6	104	[NT]
Extracted ISTD $^{13}C_2$ *PFTeDA*	%		Org-029	84	1	93	91	2	102	[NT]
Extracted ISTD $^{13}C_2$ *4:2FTS*	%		Org-029	142	1	92	83	10	136	[NT]
Extracted ISTD $^{13}C_2$ *6:2FTS*	%		Org-029	143	1	130	122	6	145	[NT]
Extracted ISTD $^{13}C_2$ *8:2FTS*	%		Org-029	115	1	144	136	6	105	[NT]
Extracted ISTD $^{13}C_8$ *FOSA*	%		Org-029	70	1	61	53	14	70	[NT]
Extracted ISTD d_3 *N MeFOSA*	%		Org-029	35	1	36	25	36	36	[NT]
Extracted ISTD d_5 *N EtFOSA*	%		Org-029	34	1	38	26	38	35	[NT]
Extracted ISTD d_7 *N MeFOSE*	%		Org-029	55	1	50	43	15	57	[NT]

QUALITY CONTROL: PFAS in Waters Trace Extended						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Extracted ISTD d_9 *N EtFOSE*	%		Org-029	48	1	49	39	23	55	[NT]
Extracted ISTD d_3 *N MeFOSAA*	%		Org-029	114	1	102	93	9	115	[NT]
Extracted ISTD d_5 *N EtFOSAA*	%		Org-029	130	1	113	112	1	130	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W7	[NT]
Date extracted	-			29/07/2022	1	29/07/2022	01/08/2022		29/07/2022	[NT]
Date analysed	-			31/07/2022	1	31/07/2022	02/08/2022		31/07/2022	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	1	<10	<10	0	114	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	1	<10	<10	0	114	[NT]
Benzene	µg/L	1	Org-023	<1	1	<1	<1	0	109	[NT]
Toluene	µg/L	1	Org-023	<1	1	<1	<1	0	106	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	118	[NT]
m+p-xylene	µg/L	2	Org-023	<2	1	<2	<2	0	119	[NT]
o-xylene	µg/L	1	Org-023	<1	1	<1	<1	0	117	[NT]
Naphthalene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	93	1	91	93	2	97	[NT]
Surrogate toluene-d8	%		Org-023	97	1	95	97	2	100	[NT]
Surrogate 4-BFB	%		Org-023	105	1	104	104	0	107	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	301640-3
Date extracted	-			29/07/2022	1	30/07/2022	30/07/2022		30/07/2022	30/07/2022
Date analysed	-			30/07/2022	1	31/07/2022	31/07/2022		31/07/2022	31/07/2022
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	1	<50	<50	0	91	83
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	1	<100	<100	0	98	92
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	1	<100	<100	0	100	100
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	1	<50	<50	0	91	83
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	1	<100	<100	0	98	92
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	1	<100	<100	0	100	100
Surrogate o-Terphenyl	%		Org-020	73	1	79	82	4	83	89

QUALITY CONTROL: PAHs in Water - Low Level						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	301640-4
Date extracted	-			30/07/2022	1	30/07/2022	30/07/2022		30/07/2022	30/07/2022
Date analysed	-			01/08/2022	1	01/08/2022	01/08/2022		01/08/2022	01/08/2022
Naphthalene	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	86	94
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	85	91
Fluorene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	88	94
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	96	102
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	0.2	0.2	0	96	94
Pyrene	µg/L	0.1	Org-022/025	<0.1	1	0.2	0.2	0	107	103
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	75	79
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	84	86
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	110	1	98	96	2	110	112

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date prepared	-			02/08/2022	1	02/08/2022	02/08/2022		02/08/2022	[NT]
Date analysed	-			02/08/2022	1	02/08/2022	02/08/2022		02/08/2022	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	1	<1	[NT]		104	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	1	<0.1	[NT]		101	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	1	<1	[NT]		103	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	1	2	[NT]		102	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	1	<1	[NT]		103	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	1	<0.05	<0.05	0	98	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	1	3	[NT]		101	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	1	14	[NT]		105	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			28/07/2022	[NT]	[NT]	[NT]	[NT]	28/07/2022	[NT]
Date analysed	-			28/07/2022	[NT]	[NT]	[NT]	[NT]	28/07/2022	[NT]
pH	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	101	[NT]
Electrical Conductivity	µS/cm	1	Inorg-002	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Chloride, Cl	mg/L	1	Inorg-081	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Sulphate, SO4	mg/L	1	Inorg-081	<1	[NT]	[NT]	[NT]	[NT]	93	[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.

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).

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	Alistair Mitchell

Sample Login Details

Your reference	E35073B, Parramatta
Envirolab Reference	301640
Date Sample Received	28/07/2022
Date Instructions Received	28/07/2022
Date Results Expected to be Reported	05/08/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	8 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	12
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
ph 02 9910 6200 fax 02 9910 6201
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Sample ID	VOCs in water	PFAS in Waters Trace Extended	vTRH(C6-C10)/BTEXN in Water	svTRH (C10-C40) in Water	PAHs in Water - Low Level	HM in water - dissolved	pH	Electrical Conductivity	Chloride, Cl	Sulphate, SO4	On Hold
MW1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
MW3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
MW6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
WDUP1	✓	✓	✓	✓	✓	✓					
WDUP2											✓
TB-W1			✓								
TS-W1			✓								
FR			✓								

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: E35073B 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: Alistair Mitchell amitchell@jkenvironments.com.au

Location: Parramatta

Sampler: AD/NF

Sample Preserved in Esky on Ice

Tests Required

Date Sampled	Lab Ref:	Sample Number	Sample Containers	PID	Sample Description	Combo 3L	PFAS (Trace Level - extended)	VOCs	pH / EC/suplhate/ chloride	BTEX							
27/07/2022	1	MW1	G1x2, Vx4, Px2, H, PVC	3.5	Water	X	X	X	X								
27/07/2022	2	MW3	G1x2, Vx4, Px2, H, PVC	2.6	Water	X	X	X	X								
27/07/2022	3	MW6	G1x2, Vx4, Px2, H, PVC	41.5	Water	X	X	X	X								
27/07/2022	4	WDUP1	G1x2, Vx4, Px2, H	–	Duplicate	X	X	X									
27/07/2022	5	WDUP2	G1x2, Vx4, Px2, H	–	Duplicate	X	X	X									
27/07/2022	6	TB-W1	V	–	Trip Blank					X							
27/07/2022	7	TS-W1	V	–	Trip Spike					X							
27/07/2022	8	FR	Vx2	–	Field Rinsate					X							
	9	Unlabeled															

ENVIROLAB

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

Job No: 301640

Date Received: 28.7.22
Time Received: 1230
Received By: AP
Temp: Cool/Ambient 12°
Cooling: Ice/Icepack
Security: Intact/Broken/None

Remarks (comments/detection limits required):

All analysis PQLs to ANZECC (2000) Detection Limits Please

Sample Containers:
G1 - 500mL Amber Glass Bottle G2 - 1L Amber Glass Bottle
V - BTEX Vial H - HNO3 Wash PVC
PVC - HDPE Plastic Bottles P - PFAS Bottle

Relinquished By:	Date: 27-07-2022	Time: 5PM	Received By:	Date: 28/7/22
			AP - ELS SYD	1230

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

CERTIFICATE OF ANALYSIS 32570

Client Details

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

Sample Details

Your Reference	**E35073B**
Number of Samples	1 Soil
Date samples received	19/07/2022
Date completed instructions received	19/07/2022

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	25/07/2022
Date of Issue	25/07/2022

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

Results Approved By
Chris De Luca, Operations Manager

Authorised By

Pamela Adams, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		32570-1
Your Reference	UNITS	SDUP2
Date Sampled		12/07/2022
Type of sample		Soil
Date extracted	-	19/07/2022
Date analysed	-	21/07/2022
vTRH C_6 - C_9	mg/kg	<25
vTRH C_6 - C_{10}	mg/kg	<25
TRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
Naphthalene	mg/kg	<1
Total BTEX	mg/kg	<1
Total +ve Xylenes	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	107

TRH Soil C10-C40 NEPM		
Our Reference		32570-1
Your Reference	UNITS	SDUP2
Date Sampled		12/07/2022
Type of sample		Soil
Date extracted	-	19/07/2022
Date analysed	-	20/07/2022
TRH C_{10} - C_{14}	mg/kg	<50
TRH C_{15} - C_{28}	mg/kg	<100
TRH C_{29} - C_{36}	mg/kg	<100
Total +ve TRH (C10-C36)	mg/kg	<50
TRH >C_{10} -C_{16}	mg/kg	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50
TRH >C_{16} -C_{34}	mg/kg	<100
TRH >C_{34} -C_{40}	mg/kg	<100
Total +ve TRH (>C10-C40)	mg/kg	<50
Surrogate o-Terphenyl	%	86

PAHs in Soil		
Our Reference		32570-1
Your Reference	UNITS	SDUP2
Date Sampled		12/07/2022
Type of sample		Soil
Date extracted	-	19/07/2022
Date analysed	-	22/07/2022
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b,j&k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Total +ve PAH's	mg/kg	<0.05
Benzo(a)pyrene TEQ calc (Zero)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc (Half)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc (PQL)	mg/kg	<0.5
Surrogate p-Terphenyl-d_{14}	%	102

OCP in Soil		
Our Reference		32570-1
Your Reference	UNITS	SDUP2
Date Sampled		12/07/2022
Type of sample		Soil
Date extracted	-	19/07/2022
Date analysed	-	22/07/2022
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	%	84

OP in Soil		
Our Reference		32570-1
Your Reference	UNITS	SDUP2
Date Sampled		12/07/2022
Type of sample		Soil
Date extracted	-	19/07/2022
Date analysed	-	22/07/2022
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
Surrogate 2-chlorophenol-d4	%	84

PCBs in Soil		
Our Reference		32570-1
Your Reference	UNITS	SDUP2
Date Sampled		12/07/2022
Type of sample		Soil
Date extracted	-	19/07/2022
Date analysed	-	22/07/2022
Aroclor 1016	mg/kg	<0.1
Aroclor 1221	mg/kg	<0.1
Aroclor 1232	mg/kg	<0.1
Aroclor 1242	mg/kg	<0.1
Aroclor 1248	mg/kg	<0.1
Aroclor 1254	mg/kg	<0.1
Aroclor 1260	mg/kg	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1
Surrogate 2-fluorobiphenyl	%	96

Acid Extractable metals in soil		
Our Reference		32570-1
Your Reference	UNITS	SDUP2
Date Sampled		12/07/2022
Type of sample		Soil
Date digested	-	20/07/2022
Date analysed	-	21/07/2022
Arsenic	mg/kg	9
Cadmium	mg/kg	<0.4
Chromium	mg/kg	22
Copper	mg/kg	15
Lead	mg/kg	17
Mercury	mg/kg	<0.1
Nickel	mg/kg	10
Zinc	mg/kg	32

Moisture		
Our Reference		32570-1
Your Reference	UNITS	SDUP2
Date Sampled		12/07/2022
Type of sample		Soil
Date prepared	-	19/07/2022
Date analysed	-	20/07/2022
Moisture	%	18

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

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			19/07/2022	[NT]	[NT]	[NT]	[NT]	19/07/2022	[NT]
Date analysed	-			21/07/2022	[NT]	[NT]	[NT]	[NT]	21/07/2022	[NT]
vTRH C_6 - C_9	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	94	[NT]
vTRH C_6 - C_{10}	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	94	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	[NT]	[NT]	[NT]	[NT]	88	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	[NT]	[NT]	[NT]	[NT]	87	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	93	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	101	[NT]
o-Xylene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Naphthalene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	114	[NT]	[NT]	[NT]	[NT]	112	[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	-			19/07/2022	[NT]	[NT]	[NT]	[NT]	19/07/2022	[NT]
Date analysed	-			20/07/2022	[NT]	[NT]	[NT]	[NT]	20/07/2022	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	93	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	110	[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]	93	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	110	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	107	[NT]
Surrogate o-Terphenyl	%		Org-020	95	[NT]	[NT]	[NT]	[NT]	82	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			19/07/2022	[NT]	[NT]	[NT]	[NT]	19/07/2022	[NT]
Date analysed	-			22/07/2022	[NT]	[NT]	[NT]	[NT]	22/07/2022	[NT]
Naphthalene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Acenaphthylene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Fluorene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	86	[NT]
Phenanthrene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Anthracene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Pyrene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Benzo(b,j&k)fluoranthene	mg/kg	0.2	Org-022	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022	<0.05	[NT]	[NT]	[NT]	[NT]	98	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d_{14}	%		Org-022	116	[NT]	[NT]	[NT]	[NT]	104	[NT]

QUALITY CONTROL: OCP in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			19/07/2022	[NT]	[NT]	[NT]	[NT]	19/07/2022	[NT]
Date analysed	-			22/07/2022	[NT]	[NT]	[NT]	[NT]	22/07/2022	[NT]
alpha-BHC	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	80	[NT]
Hexachlorobenzene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	82	[NT]
gamma-BHC	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	92	[NT]
delta-BHC	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	88	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	84	[NT]
alpha-chlordane	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Dieldrin	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	80	[NT]
Endrin	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	116	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	84	[NT]
Methoxychlor	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 2-chlorophenol-d4	%		Org-022	92	[NT]	[NT]	[NT]	[NT]	94	[NT]

QUALITY CONTROL: OP in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			19/07/2022	[NT]	[NT]	[NT]	[NT]	19/07/2022	[NT]
Date analysed	-			22/07/2022	[NT]	[NT]	[NT]	[NT]	22/07/2022	[NT]
Azinphos-methyl	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyrifos	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	90	[NT]
Diazinon	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	112	[NT]
Dichlorovos	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	120	[NT]
Fenitrothion	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	92	[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]
Surrogate 2-chlorophenol-d4	%		Org-022	92	[NT]	[NT]	[NT]	[NT]	94	[NT]

QUALITY CONTROL: PCBs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			19/07/2022	[NT]	[NT]	[NT]	[NT]	19/07/2022	[NT]
Date analysed	-			22/07/2022	[NT]	[NT]	[NT]	[NT]	22/07/2022	[NT]
Aroclor 1016	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	87	[NT]
Aroclor 1260	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 2-fluorobiphenyl	%		Org-022	108	[NT]	[NT]	[NT]	[NT]	104	[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	-			20/07/2022	[NT]	[NT]	[NT]	[NT]	20/07/2022	[NT]
Date analysed	-			21/07/2022	[NT]	[NT]	[NT]	[NT]	21/07/2022	[NT]
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	[NT]	[NT]	[NT]	[NT]	103	[NT]
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	[NT]	[NT]	[NT]	[NT]	103	[NT]
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Copper	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Lead	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	[NT]	[NT]	[NT]	[NT]	118	[NT]
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]

Result Definitions

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

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

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

SAMPLE RECEIPT ADVICE

Client Details

Client	JK Environments
Attention	Vittal Boggaram

Sample Login Details

Your reference	E35073B
Envirolab Reference	32570
Date Sample Received	19/07/2022
Date Instructions Received	19/07/2022
Date Results Expected to be Reported	25/07/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	1 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	11.3
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

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

Analysis Underway, details on the following page:

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Sample ID	vTRH(C6-C10)/BTEXN in Soil	TRH Soil C10-C40 NEPM	PAHs in Soil	OCP in Soil	OP in Soil	PCBsin Soil	Acid Extractable metalsin soil
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.

300587

COC 15/7 @ 1500

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: E35073B Date Results Required: STANDARD Page: 1 of 6	**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:	Parramatta East	Sample Preserved in Esky on Ice
Sampler:	HW/NF	Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 2	Combo 3	Combo 6	Asbestos 500mL	PFAS - Routine	BTEX	Asbestos					
12/07/2022	1	BH1	0-0.1	G, A	0	F: Sandy gravel			X	X								
12/07/2022	2	BH2	0.1-0.4	G, A	0	F: Gravelly sand			X	X								
12/07/2022	3	BH2	0.5-0.7	G, A	0	Silty clay												
12/07/2022	4	BH3	0.04-0.1	G, A	0	F: Sandy gravel			X	X								
12/07/2022	5	BH3	0.4-0.5	G, A	0	Silty clay												
12/07/2022	6	BH3	0.8-0.95	G, A	0	Silty clay												
13/07/2022	7	BH4	0.04-0.3	G, A	0	F: Gravelly sand			X	X								
13/07/2022	8	BH4	0.5-0.95	G, A	0	Silty clay												
13/07/2022	9	BH4	1.3-1.5	G, A	0	Silty clay												
13/07/2022	10	BH5	0.04-0.3	G, A	0	F: Gravelly sand			X	X								
13/07/2022	11	BH5	0.5-0.95	G, A	0	Silty clay												
13/07/2022	12	BH5	1.5-1.7	G, A	0	Silty clay												
13/07/2022	13	BH101	0-0.1	G, A	0	F: Silty clay			X	X								
13/07/2022	14	BH101	0.1-0.3	G, A	0	F: Silty clay												
13/07/2022	15	BH101	0.4-0.5	G, A	0	Silty clay												
13/07/2022	16	BH102	0-0.1	G, A, PFAS	0	F: Sandy clay			X	X	X							
13/07/2022	17	BH102	0.1-0.3	G, A, PFAS	0	F: Sandy clay												
13/07/2022	18	BH102	0.4-0.6	G, A, PFAS	0	Silty clay												
13/07/2022	19	BH103	0-0.1	G, A	0	F: Sandy clay			X	X								
13/07/2022	20	BH103	0.1-0.3	G, A	0	F: Sandy clay												
13/07/2022	21	BH103	0.4-0.6	G, A	0	Silty clay												
13/07/2022	22	BH104	0-0.2	G, A, PFAS	0	F: Sandy clay			X	X	X							
13/07/2022	23	BH104	0.4-0.6	G, A, PFAS	0	Silty clay												
13/07/2022	24	BH112	0-0.1	G, A	0	F: Clayey sand			X	X								
13/07/2022	25	BH112	0.1-0.4	G, A	0	F: Silty clay												

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

Relinquished By:	Date: 15-07-2022	Time: 2pm	Received By:	Date:
VB				

ELS 300587 Chain 18/7/22 1300

300587

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: E35073B Date Results Required: STANDARD Page: 2 of 6	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:	Parramatta						Sample Preserved in Esky on Ice											
Sampler:	HW/NF						Tests Required											
Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 2	Combo 3	Combo 6	Asbestos 500mL	PFAS - Routine	BTEX	Asbestos					
13/07/2022	26	BH112	0.5-0.6	G, A	0	Silty clay												
12/07/2022	27	SDUP1	-	G	-	Duplicate			X									
13/07/2022	28	SDUP2	-	G	-	Duplicate			X		Please send to VIC							
13/07/2022	29	SDUP3	-	G, A, PFAS	-	Duplicate			X	X	X							
13/07/2022	30	TS	-	G	-	Spike						X						
13/07/2022	31	TB	-	G, PFAS	-	Blank		X			X							
13/07/2022	32	FCF1-Surface		A	-	FCF Frag							X					

(1)

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

Relinquished By: VB	Date: 15-07-2022	Time: 2pm	Received By:	Date:

ELS 14/7/22 C.Malenna 1800

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CERTIFICATE OF ANALYSIS 32850

Client Details

Client	JK Environments
Attention	Alistair Mitchell
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E35073B**
Number of Samples	1 Water
Date samples received	02/08/2022
Date completed instructions received	02/08/2022

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	09/08/2022
Date of Issue	09/08/2022

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Results Approved By
Chris De Luca, Operations Manager

Authorised By



Pamela Adams, Laboratory Manager

VOCs in water - Routine Level		
Our Reference		32850-1
Your Reference	UNITS	WDUP2
Date Sampled		27/07/2022
Type of sample		Water
Date extracted	-	04/08/2022
Date analysed	-	04/08/2022
Dichlorodifluoromethane	µg/L	<10
Chloromethane	µg/L	<10
Vinyl Chloride	µg/L	<10
Bromomethane	µg/L	<10
Chloroethane	µg/L	<10
Trichlorofluoromethane	µg/L	<10
1,1-Dichloroethene	µg/L	<1
Trans-1,2-dichloroethene	µg/L	<1
1,1-dichloroethane	µg/L	<1
Cis-1,2-dichloroethene	µg/L	<1
Bromochloromethane	µg/L	<1
Chloroform	µg/L	<1
2,2-dichloropropane	µg/L	<1
1,2-dichloroethane	µg/L	<1
1,1,1-trichloroethane	µg/L	<1
1,1-dichloropropene	µg/L	<1
Cyclohexane	µg/L	<1
Carbon tetrachloride	µg/L	<1
Benzene	µg/L	<1
Dibromomethane	µg/L	<1
1,2-dichloropropane	µg/L	<1
Trichloroethene	µg/L	<1
Bromodichloromethane	µg/L	<1
trans-1,3-dichloropropene	µg/L	<1
cis-1,3-dichloropropene	µg/L	<1
1,1,2-trichloroethane	µg/L	<1
Toluene	µg/L	<1
1,3-dichloropropane	µg/L	<1
Dibromochloromethane	µg/L	<1
1,2-dibromoethane	µg/L	<1
Tetrachloroethene	µg/L	<1
1,1,1,2-tetrachloroethane	µg/L	<1
Chlorobenzene	µg/L	<1
Ethylbenzene	µg/L	<1

VOCs in water - Routine Level		
Our Reference		32850-1
Your Reference	UNITS	WDUP2
Date Sampled		27/07/2022
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	%	104
Surrogate toluene-d8	%	101
Surrogate 4-BFB	%	94

vTRH(C6-C10)/BTEXN in Water		
Our Reference	UNITS	32850-1
Your Reference		WDUP2
Date Sampled		27/07/2022
Type of sample		Water
Date extracted	-	04/08/2022
Date analysed	-	04/08/2022
TRH C_6 - C_9	µg/L	<10
TRH C_6 - C_{10}	µg/L	<10
TRH C_6 -C_{10} less BTEX (F1)	µg/L	<10
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Naphthalene	µg/L	<1
Total +ve Xylenes	µg/L	<1
Total BTEX in water	µg/L	<1
Surrogate Dibromofluoromethane	%	111
Surrogate toluene-d8	%	108
Surrogate 4-BFB	%	97

TRH Water(C10-C40) NEPM		
Our Reference		32850-1
Your Reference	UNITS	WDUP2
Date Sampled		27/07/2022
Type of sample		Water
Date extracted	-	02/08/2022
Date analysed	-	04/08/2022
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	%	76

PAHs in Water - Low Level		
Our Reference		32850-1
Your Reference	UNITS	WDUP2
Date Sampled		27/07/2022
Type of sample		Water
Date extracted	-	02/08/2022
Date analysed	-	03/08/2022
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	NIL (+)VE PAH
Benzo(a)pyrene TEQ	µg/L	<0.5
Surrogate p-Terphenyl-d_{14}	%	104

HM in water - dissolved		
Our Reference	UNITS	32850-1
Your Reference		WDUP2
Date Sampled		27/07/2022
Type of sample		Water
Date prepared	-	04/08/2022
Date analysed	-	04/08/2022
Arsenic-Dissolved	µg/L	<1
Cadmium-Dissolved	µg/L	<0.1
Chromium-Dissolved	µg/L	<1
Copper-Dissolved	µg/L	1
Lead-Dissolved	µg/L	<1
Nickel-Dissolved	µg/L	<1
Zinc-Dissolved	µg/L	4
Mercury-Dissolved	µg/L	<0.05

Method ID	Methodology Summary
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Metals-022 ICP-MS	Determination of various metals by ICP-MS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-022	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater 2013.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: VOCs in water - Routine Level						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			04/08/2022	[NT]	[NT]	[NT]	[NT]	04/08/2022	[NT]
Date analysed	-			04/08/2022	[NT]	[NT]	[NT]	[NT]	04/08/2022	[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]	105	[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]	113	[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]	106	[NT]
1,1,1-trichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	113	[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]	[NT]	[NT]
Bromodichloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	109	[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]	113	[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]	122	[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]	113	[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	104	[NT]	[NT]	[NT]	[NT]	98	[NT]
Surrogate toluene-d8	%		Org-023	100	[NT]	[NT]	[NT]	[NT]	104	[NT]
Surrogate 4-BFB	%		Org-023	91	[NT]	[NT]	[NT]	[NT]	104	[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	-			06/08/2022	[NT]	[NT]	[NT]	[NT]	06/08/2022	[NT]
Date analysed	-			06/08/2022	[NT]	[NT]	[NT]	[NT]	06/08/2022	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	95	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	95	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	92	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	98	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Naphthalene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Surrogate Dibromofluoromethane	%		Org-023	106	[NT]	[NT]	[NT]	[NT]	104	[NT]
Surrogate toluene-d8	%		Org-023	97	[NT]	[NT]	[NT]	[NT]	97	[NT]
Surrogate 4-BFB	%		Org-023	98	[NT]	[NT]	[NT]	[NT]	92	[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	-			02/08/2022	[NT]	[NT]	[NT]	[NT]	02/08/2022	[NT]
Date analysed	-			04/08/2022	[NT]	[NT]	[NT]	[NT]	04/08/2022	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	84	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	103	[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]	84	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	103	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	107	[NT]
Surrogate o-Terphenyl	%		Org-020	77	[NT]	[NT]	[NT]	[NT]	67	[NT]

QUALITY CONTROL: PAHs in Water - Low Level						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			02/08/2022	[NT]	[NT]	[NT]	[NT]	02/08/2022	[NT]
Date analysed	-			03/08/2022	[NT]	[NT]	[NT]	[NT]	03/08/2022	[NT]
Naphthalene	µg/L	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	72	[NT]
Acenaphthylene	µg/L	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Fluorene	µg/L	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Phenanthrene	µg/L	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Anthracene	µg/L	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Pyrene	µg/L	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Benzo(a)anthracene	µg/L	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Benzo(b,j&k)fluoranthene	µg/L	0.2	Org-022	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	116	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d_{14}	%		Org-022	120	[NT]	[NT]	[NT]	[NT]	104	[NT]

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			04/08/2022	1	04/08/2022	04/08/2022		04/08/2022	[NT]
Date analysed	-			04/08/2022	1	04/08/2022	04/08/2022		04/08/2022	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	1	<1	[NT]		100	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022 ICP-MS	<0.1	1	<0.1	[NT]		102	[NT]
Chromium-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	1	<1	[NT]		102	[NT]
Copper-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	1	1	[NT]		102	[NT]
Lead-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	1	<1	[NT]		108	[NT]
Nickel-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	1	<1	[NT]		102	[NT]
Zinc-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	1	4	[NT]		102	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021 CV-AAS	<0.05	1	<0.05	<0.05	0	109	[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.

Measurement Uncertainty estimates are available for most tests upon request.

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

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

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

SAMPLE RECEIPT ADVICE

Client Details

Client	JK Environments
Attention	Alistair Mitchell

Sample Login Details

Your reference	E35073B
Envirolab Reference	32850
Date Sample Received	02/08/2022
Date Instructions Received	02/08/2022
Date Results Expected to be Reported	08/08/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	1 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	12.4
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 - Low Level	HM in water - dissolved	PFAS in water TRACE Extended
WDUP2	✓	✓	✓	✓	✓	✓

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

Additional Info

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

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD 12 ASHLEY STREET CHATSWOOD NSW 2067 P: (02) 99106200 F: (02) 99106201 Attention: Aileen	JKE Job Number: E35073B 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: Alistair Mitchell amitchell@jkenvironments.com.au

Location:	Parramatta	Sample Preserved in Esky on Ice
Sampler:	AD/NF	Tests Required

Date Sampled	Lab Ref:	Sample Number	Sample Containers	PID	Sample Description	Combo 3L	PFAS (Trace Level - extended)	VOCs	pH / EC/suplhate/ chloride	BTEX
27/07/2022	1	MW1	G1x2, Vx4, Px2, H, PVC	3.5	Water	X	X	X	X	
27/07/2022	2	MW3	G1x2, Vx4, Px2, H, PVC	2.6	Water	X	X	X	X	
27/07/2022	3	MW6	G1x2, Vx4, Px2, H, PVC	41.5	Water	X	X	X	X	
27/07/2022	4	WDUP1	G1x2, Vx4, Px2, H	–	Duplicate	X	X	X		
27/07/2022	5	WDUP2	G1x2, Vx4, Px2, H	–	Duplicate	X	X	X	melb	
27/07/2022	6	TB-W1	V	–	Trip Blank melbs		ALS			X
27/07/2022	7	TS-W1	V	–	Trip Spike					X
27/07/2022	8	FR	Vx2	–	Field Rinsate					X
	9	Unlabeled								

(1)

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

Job No: 301540

Date Received: 28-7-22
Time Received: 1230
Received By: AP
Temp: Cool/Ambient 12°
Cooling: Ice/Icepack
Security: Intact/Broken/None

Remarks (comments/detection limits required):	Sample Containers:
All analysis PQLs to ANZECC (2000) Detection Limits Please	G1 - 500mL Amber Glass Bottle G2 - 1L Amber Glass Bottle V - BTEX Vial H - HNO3 Wash PVC PVC - HDPE Plastic Bottles P - PFAS Bottle

Relinquished By:	Date: 27-07-2022	Time: 5PM	Received By:	Date: 28/7/22
			AP ELSYD	1230

Relinquished by Elsyd
C. McLennan
1/8/22 1200

Aileen Hie

From: Alistair Mitchell <AMitchell@jkenvironments.com.au>
Sent: Friday, 29 July 2022 3:26 PM
To: Aileen Hie
Subject: RE: E35073B (ELS 301640)

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.

Ahh yes. Can you send the PFAS sample to ALS please?

Relinquished by ELS 3461
C. McKenzie
1/8/22 1200

Thanks,

Regards
Alistair Mitchell
Environmental Scientist

T: +612 9888 5000
D: 0421 687 953
E: AMitchell@jkenvironments.com.au
www.jkenvironments.com.au

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

JKEnvironments

This email and any attachments are confidential and may be privileged in which case neither is intended to be waived. If you have received this message in error, please notify us and remove it from your system. It is your responsibility to check any attachments for viruses and defects before opening or sending them on. At the Company's discretion we may send a paper copy for confirmation. In the event of any discrepancy between paper and electronic versions the paper version is to take precedence.

From: Aileen Hie <AHie@envirolab.com.au>
Sent: Friday, 29 July 2022 3:23 PM
To: Alistair Mitchell <AMitchell@jkenvironments.com.au>
Subject: RE: E35073B (ELS 301640)

Ok. They may not be able to do trace PFAS though

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: Alistair Mitchell <AMitchell@jkenvironments.com.au>
Sent: Friday, 29 July 2022 2:34 PM
To: Aileen Hie <AHie@envirolab.com.au>
Subject: RE: E35073B (ELS 301640)

Envirolab Services (WA) Pty Ltd trading as MPL Laboratories
ABN 53 140 099 207
16-18 Hayden Court Myaree WA 6154
ph 08 9317 2505 fax 08 9317 4163
lab@mpl.com.au
www.mpl.com.au

CERTIFICATE OF ANALYSIS 285674

Client Details

Client	JK Environments
Attention	Alistair Mitchell
Address	PO Box 976, NORTH RYDE BC, NSW, 1670

Sample Details

Your Reference	**E350738**
Number of Samples	1 Soil
Date samples received	21/07/2022
Date completed instructions received	21/07/2022
Location	Paramatta

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	28/07/2022
Date of Issue	28/07/2022

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Asbestos Approved By
Analysed by Asbestos Approved Analyst: Lalanee Rupasinghe
Results Approved By
Lalanee Rupasinghe, OH Lab Analyst
Lien Tang, Assistant Operations Manager
Travis Carey, Organics - Team Leader

Authorised By

Michael Kubiak, Laboratory Manager

svTRH(C10-C36) in soil		
Our Reference		285674-1
Your Reference	UNITS	SDUP4
Date Sampled		13/07/2022
Type of sample		Soil
Date extracted	-	25/07/2022
Date analysed	-	26/07/2022
TRH C_{10} - C_{14}	mg/kg	<50
TRH C_{15} - C_{28}	mg/kg	<100
TRH C_{29} - C_{36}	mg/kg	<100
TRH >C_{10} - C_{16}	mg/kg	<50
TRH >C_{10} -C_{16} less N (F2)	mg/kg	<50
TRH >C_{16} - C_{34}	mg/kg	<100
TRH >C_{34} - C_{40}	mg/kg	<100
Surrogate o-Terphenyl	%	101

vTRH(C6-C10)/MBTEXN in soil		
Our Reference	UNITS	285674-1
Your Reference		SDUP4
Date Sampled		13/07/2022
Type of sample		Soil
Date extracted	-	25/07/2022
Date analysed	-	27/07/2022
TRH C_6 - C_9	mg/kg	<25
TRH C_6 - C_{10}	mg/kg	<25
TRH C_6 -C_{10} less BTEX (F1)	mg/kg	<25
MTBE	mg/kg	<0.5
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-xylene	mg/kg	<1
Naphthalene	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	90

PAHs in Soil		
Our Reference	UNITS	285674-1
Your Reference		SDUP4
Date Sampled		13/07/2022
Type of sample		Soil
Date extracted	-	25/07/2022
Date analysed	-	26/07/2022
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	0.1
Pyrene	mg/kg	0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	0.09
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5
Total Positive PAHs	mg/kg	0.35
Surrogate p-Terphenyl-D_{14}	%	97

Organochlorine Pesticides in soil		
Our Reference	UNITS	285674-1
Your Reference		SDUP4
Date Sampled		13/07/2022
Type of sample		Soil
Date extracted	-	25/07/2022
Date analysed	-	26/07/2022
Hexachlorobenzene (HCB)	mg/kg	<0.1
a-BHC	mg/kg	<0.1
b-BHC	mg/kg	<0.1
Lindane (g-BHC)	mg/kg	<0.1
d-BHC	mg/kg	<0.1
Heptachlor	mg/kg	<0.1
Aldrin	mg/kg	<0.1
Heptachlor Epoxide	mg/kg	<0.1
a-Chlordane	mg/kg	<0.1
g-Chlordane	mg/kg	<0.1
a-Endosulphan	mg/kg	<0.1
p,p'-DDE	mg/kg	<0.1
Dieldrin	mg/kg	<0.1
Endrin	mg/kg	<0.1
p,p'-DDD	mg/kg	<0.1
b-Endosulphan	mg/kg	<0.1
Endrin Aldehyde	mg/kg	<0.1
Endosulfan Sulphate	mg/kg	<0.1
p,p'-DDT	mg/kg	<0.1
Endrin Ketone	mg/kg	<0.1
Methoxychlor	mg/kg	<0.1
Surrogate 2-chlorophenol-d4	%	87

Organophosphorus Pesticides		
Our Reference	UNITS	285674-1
Your Reference		SDUP4
Date Sampled		13/07/2022
Type of sample		Soil
Date extracted	-	25/07/2022
Date analysed	-	26/07/2022
Diazinon (Dimpylate)	mg/kg	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1
Ronnel	mg/kg	<0.1
Fenitrothion	mg/kg	<0.1
Malathion (Maldison)	mg/kg	<0.1
Chlorpyrifos (ethyl)	mg/kg	<0.1
Parathion (ethyl)	mg/kg	<0.1
Ethion	mg/kg	<0.1
Bromophos Ethyl	mg/kg	<0.1
Dimethoate	mg/kg	<0.1
Dichlorvos	mg/kg	<0.1
Azinphos Methyl (Guthion)	mg/kg	<0.1
Surrogate 2-chlorophenol-d4	%	87

PCBs in Soil		
Our Reference		285674-1
Your Reference	UNITS	SDUP4
Date Sampled		13/07/2022
Type of sample		Soil
Date extracted	-	25/07/2022
Date analysed	-	26/07/2022
Arochlor 1016	mg/kg	<0.1
Arochlor 1221	mg/kg	<0.1
Arochlor 1232	mg/kg	<0.1
Arochlor 1242	mg/kg	<0.1
Arochlor 1248	mg/kg	<0.1
Arochlor 1254	mg/kg	<0.1
Surrogate 2-fluorobiphenyl	%	96

Acid Extractable metals in soil		
Our Reference		285674-1
Your Reference	UNITS	SDUP4
Date Sampled		13/07/2022
Type of sample		Soil
Date digested	-	25/07/2022
Date analysed	-	28/07/2022
Arsenic	mg/kg	10
Cadmium	mg/kg	<0.4
Chromium	mg/kg	24
Copper	mg/kg	9
Lead	mg/kg	40
Mercury	mg/kg	0.2
Nickel	mg/kg	14
Zinc	mg/kg	110

Moisture		
Our Reference		285674-1
Your Reference	UNITS	SDUP4
Date Sampled		13/07/2022
Type of sample		Soil
Date prepared	-	25/07/2022
Date analysed	-	26/07/2022
Moisture	%	12

Asbestos ID - soils NEPM - ASB-001		
Our Reference		285674-1
Your Reference	UNITS	SDUP4
Date Sampled		13/07/2022
Type of sample		Soil
Date analysed	-	28/07/2022
Sample Weight	g	700
Sample Description	-	Soil
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No asbestos detected
Total Asbestos #1	g/kg	<0.1
Asbestos ID <0.1g/kg*	-	No visible asbestos detected
ACM >7mm Estimation*	g	--
FA and AF Estimation*	g	--
ACM >7mm Estimation*	%(w/w)	<0.01
FA and AF Estimation* #2	%(w/w)	<0.001

Method ID	Methodology Summary
ASB-001	Asbestos ID –Bulk - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques, including Synthetic Mineral Fibres and Organic Fibres as per Australian Standard 4964-2004. Asbestos ID –NEPM - 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 deg 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. For urine samples total Mercury is determined, however, mercury in urine is almost entirely in the inorganic form (CDC).

Method ID	Methodology Summary
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-021/022/025	Organophosphorus Pesticides in soil by DCM:Acetone extraction and water by DCM extraction with determination by GC-ECD/GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	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-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. Benzo(a)pyrene TEQ as per NEPM draft B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-022/025-OCP	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

QUALITY CONTROL: svTRH(C10-C36) in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			25/07/2022	[NT]	[NT]	[NT]	[NT]	25/07/2022	[NT]
Date analysed	-			26/07/2022	[NT]	[NT]	[NT]	[NT]	26/07/2022	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	98	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	96	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	83	[NT]
TRH >C_{10} - C_{16}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	81	[NT]
TRH >C_{16} - C_{34}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	83	[NT]
TRH >C_{34} - C_{40}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	76	[NT]
Surrogate o-Terphenyl	%		Org-020	113	[NT]	[NT]	[NT]	[NT]	109	[NT]

QUALITY CONTROL: vTRH(C6-C10)/MBTEXN in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			25/07/2022	[NT]	[NT]	[NT]	[NT]	25/07/2022	[NT]
Date analysed	-			27/07/2022	[NT]	[NT]	[NT]	[NT]	27/07/2022	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	98	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	98	[NT]
MTBE	mg/kg	0.5	Org-023	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	[NT]	[NT]	[NT]	[NT]	95	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	[NT]	[NT]	[NT]	[NT]	95	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	101	[NT]
o-xylene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Naphthalene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	102	[NT]	[NT]	[NT]	[NT]	100	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			25/07/2022	[NT]	[NT]	[NT]	[NT]	25/07/2022	[NT]
Date analysed	-			26/07/2022	[NT]	[NT]	[NT]	[NT]	26/07/2022	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	107	[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]	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	97	[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]	110	[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]	109	[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	93	[NT]	[NT]	[NT]	[NT]	87	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			25/07/2022	[NT]	[NT]	[NT]	[NT]	25/07/2022	[NT]
Date analysed	-			26/07/2022	[NT]	[NT]	[NT]	[NT]	26/07/2022	[NT]
Hexachlorobenzene (HCB)	mg/kg	0.1	Org-022/025-OCP	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
a-BHC	mg/kg	0.1	Org-022/025-OCP	<0.1	[NT]	[NT]	[NT]	[NT]	97	[NT]
b-BHC	mg/kg	0.1	Org-022/025-OCP	<0.1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Lindane (g-BHC)	mg/kg	0.1	Org-022/025-OCP	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
d-BHC	mg/kg	0.1	Org-022/025-OCP	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025-OCP	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Aldrin	mg/kg	0.1	Org-022/025-OCP	<0.1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025-OCP	<0.1	[NT]	[NT]	[NT]	[NT]	101	[NT]
a-Chlordane	mg/kg	0.1	Org-022/025-OCP	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
g-Chlordane	mg/kg	0.1	Org-022/025-OCP	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
a-Endosulphan	mg/kg	0.1	Org-022/025-OCP	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
p,p'-DDE	mg/kg	0.1	Org-022/025-OCP	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Dieldrin	mg/kg	0.1	Org-022/025-OCP	<0.1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Endrin	mg/kg	0.1	Org-022/025-OCP	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
p,p'-DDD	mg/kg	0.1	Org-022/025-OCP	<0.1	[NT]	[NT]	[NT]	[NT]	114	[NT]
b-Endosulphan	mg/kg	0.1	Org-022/025-OCP	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025-OCP	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025-OCP	<0.1	[NT]	[NT]	[NT]	[NT]	85	[NT]
p,p'-DDT	mg/kg	0.1	Org-022/025-OCP	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endrin Ketone	mg/kg	0.1	Org-022/025-OCP	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025-OCP	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 2-chlorophenol-d4	%		Org-022/025	91	[NT]	[NT]	[NT]	[NT]	89	[NT]

QUALITY CONTROL: Organophosphorus Pesticides					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			25/07/2022	[NT]	[NT]	[NT]	[NT]	25/07/2022	[NT]
Date analysed	-			26/07/2022	[NT]	[NT]	[NT]	[NT]	26/07/2022	[NT]
Diazinon (Dimpylate)	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Ronnel	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Malathion (Maldison)	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyrifos (ethyl)	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Parathion (ethyl)	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Bromophos Ethyl	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Azinphos Methyl (Guthion)	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 2-chlorophenol-d4	%		Org-022/025	91	[NT]	[NT]	[NT]	[NT]	89	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			25/07/2022	[NT]	[NT]	[NT]	[NT]	25/07/2022	[NT]
Date analysed	-			26/07/2022	[NT]	[NT]	[NT]	[NT]	26/07/2022	[NT]
Arochlor 1016	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Arochlor 1221	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Arochlor 1232	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Arochlor 1242	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Arochlor 1248	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Arochlor 1254	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	109	[NT]
Surrogate 2-fluorobiphenyl	%		Org-022/025	101	[NT]	[NT]	[NT]	[NT]	96	[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	-			26/07/2022	[NT]	[NT]	[NT]	[NT]	26/07/2022	[NT]
Date analysed	-			28/07/2022	[NT]	[NT]	[NT]	[NT]	28/07/2022	[NT]
Arsenic	mg/kg	2	METALS-020	<2	[NT]	[NT]	[NT]	[NT]	105	[NT]
Cadmium	mg/kg	0.4	METALS-020	<0.4	[NT]	[NT]	[NT]	[NT]	107	[NT]
Chromium	mg/kg	1	METALS-020	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Copper	mg/kg	1	METALS-020	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Lead	mg/kg	1	METALS-020	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Mercury	mg/kg	0.1	METALS-021	<0.1	[NT]	[NT]	[NT]	[NT]	117	[NT]
Nickel	mg/kg	1	METALS-020	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Zinc	mg/kg	1	METALS-020	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]

QUALITY CONTROL: Moisture					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			25/07/2022	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Date analysed	-			26/07/2022	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Moisture	%	0.1	INORG-008	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

Result Definitions

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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	Alistair Mitchell

Sample Login Details

Your reference	E350738
MPL Reference	285674
Date Sample Received	21/07/2022
Date Instructions Received	21/07/2022
Date Results Expected to be Reported	28/07/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	1 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	10
Cooling Method	Ice Pack
Sampling Date Provided	Yes

Comments

Nil

Please direct any queries to:

Heram Halim	Meredith Conroy
Phone: 08 9317 2505	**Phone: 08 9317 2505**
Fax: 08 9317 4163	**Fax: 08 9317 4163**
Email: hhalim@mpl.com.au	**Email: mconroy@mpl.com.au**

Analysis Underway, details on the following page:

Envirolab Services (WA) Pty Ltd trading as MPL Laboratories
ABN 53 140 099 207
16-18 Hayden Court Myaree WA 6154
ph 08 9317 2505 fax 08 9317 4163
lab@mpl.com.au
www.mpl.com.au

Sample ID	svTRH(C10-C36) in soil	vTRH(C6-C10)/MBTEXN in soil	PAHs in Soil	Organochlorine Pesticidesin soil	Organophosphorus Pesticides	PCBsin Soil	Acid Extractable metals in soil	Asbestos ID - soils NEPM- ASB-001
SDUP4	✓	✓	✓	✓	✓	✓	✓	✓

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.

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: E35073B

Date Results Required: STANDARD

Page: 1 of 4

FROM:
JKEnvironments
REAR OF 115 WICKS ROAD
MACQUARIE PARK, NSW 2113
P: 02-9888 5000 F: 02-9888 5001
Attention: Alistair Mitchell
amitchell@jkenvironments.com.au

Location: Paramatta
Sampler: HW

Sample Preserved in Esky on Ice

Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 2	Combo 3	Combo 6	Asbestos 500mL	PFAS - Routine	BTEX	Asbestos					
12/07/2022	1	BH4	0.04-0.3	A	–	F: Gravelly Sand												
12/07/2022	2	BH4	0.5-0.95	A	–	Silty Clay												
12/07/2022	3	BH4	1.3-1.5	A	–	Silty Clay												
13/07/2022	4	BH5	0.04-0.3	A	–	F: Gravelly Sand												
13/07/2022	5	BH5	0.5-0.95	A	–	Silty Clay												
15/07/2022	6	BH6	0-0.2	G, A	0	F: Silty Sand												
15/07/2022	7	BH6	0.5-0.8	G, A	0	Silty Clay												
15/07/2022	8	BH7	0-0.1	G, A	0	F: Silty Clay			X	X								
15/07/2022	9	BH7	0.5-0.7	G, A	0	F: Silty Clay												
15/07/2022	10	BH7	1.0-1.2	G, A	0	Silty Clay												
15/07/2022	11	BH8	0.1-0.3	G, A	0	F: Silty Clay												
15/07/2022	12	BH8	0.7-0.9	G, A	1.5	Silty Clay												
103 * 13/07/2022	–	BH101	0-0.1	A	–	F: Silty Clay												
13/07/2022	13	BH101	0.1-0.3	A	–	F: Silty Clay												
13/07/2022	14	BH101	0.4-0.5	A	–	Silty Clay												
104 * 13/07/2022	–	BH102	0-0.1	A	–	F: Sandy Clay												
13/07/2022	15	BH102	0.1-0.3	A	–	F: Sandy Clay												
13/07/2022	16	BH102	0.4-0.6	A	–	Silty Clay												
105 * 13/07/2022	–	BH103	0-0.1	A	–	F: Sandy Clay												
13/07/2022	17	BH103	0.1-0.3	A	–	F: Sandy Clay												
13/07/2022	18	BH103	0.5-0.6	A	–	Silty Clay												
106 * 13/07/2022	–	BH104	0-0.2	A	–	F: Sandy Clay												
13/07/2022	19	BH104	0.4-0.6	A	–	Silty Clay												

empl Laboratories
ENVIROLAB
Job No: 285674
Date Rec: 21/7/22
Time Rec: 13:35
Rec By: GM
TAT Req: SAME 1/2/3/STD
Temp: cool / ambient
Cooling: Ice / Ice pack / None
Security Seal: Yes / No

Remarks (comments/detection limits required):

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

Relinquished By:	Date:	Time:	Received By:	Date:
	19.7.22	1400	TJHAN	19-7-2022

Relinquished by ELS sud
C. McKenzie
20/7/22 1300
CM

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

Job No: 300836
Date Received: 19.7.2022
Time Received: 1400
Received by: TJHAN
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

SAMPLE AND CHAIN OF CUSTODY FORM

TO:	**FROM:**
ENVIROLAB SERVICES PTY LTD	JKEnvironments
12 ASHLEY STREET	REAR OF 115 WICKS ROAD
CHATSWOOD NSW 2067	MACQUARIE PARK, NSW 2113
P: (02) 99106200	P: 02-9888 5000 F: 02-9888 5001
F: (02) 99106201	Attention: Alistair Mitchell
Attention: Aileen	amitchell@jkenvironments.com.au
JKE Job Number: E35073B	
Date Results Required: STANDARD	
Page: 4 of 4	

Location: Paramatta
Sampler: HW

Sample Preserved in Esky on Ice

Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 2	Combo 3	Combo 6	Asbestos 500mL	PFAS - Routine	BTEX	Asbestos					
14/07/2022	70	BH122	0.1-0.3	G, A, P	0.2	F: Silty clay												
14/07/2022	71	BH122	0.5-0.7	G, A, P	0.2	Silty Clay												
13/07/2022	72	SDUP3	–	G, A, P	–	Soil Duplicate												
(1) * 13/07/2022	#	SDUP4	–	G, A	–	Soil Duplicate			X	X		Please send to VIC						
14/07/2022	73	SDUP5	–	G, A, P	–	Soil Duplicate												
14/07/2022	74	SDUP6	–	G, A, P	–	Soil Duplicate					X							
14/07/2022	75	SDUP7	–	G, A, P	–	Soil Duplicate												
15/07/2022	76	SDUP8	–	G	–	Soil Duplicate												
15/07/2022	77	SDUP9	–	G, A, P	–	Soil Duplicate												
15/07/2022	78	TB-S2	–	V	–	Trip Blank						X						
15/07/2022	79	TS-S2	–	V	–	Trip Spike						X						
15/07/2022	80	FR-S2-SPT	–	Vx2	–	Field Rinsate						X						
15/07/2022	81	FR-S2-HA	–	Vx2	–	Field Rinsate						X						
14/07/2022	82	FCF1-BH116	0-0.1	A	–	Fragment							X					
14/07/2022	83	FCF2-BH116	0-0.1	A	–	Fragment												
14/07/2022	84	FCF3-BH116	0-0.1	A	–	Fragment												
14/07/2022	85	FCF1-BH118	0-0.1	A	–	Fragment							X					
14/07/2022	86	FCF2-BH118	0-0.1	A	–	Fragment												
14/07/2022	87	FCF1-BH120	0-0.1	A	–	Fragment												
14/07/2022	88	FCF2-BH120	0-0.1	A	–	Fragment							X					
14/07/2022	89	FCF3-BH120	0.1-0.4	A	–	Fragment												
14/07/2022	90	FCF4-BH120	0.1-0.4	A	–	Fragment												
14/07/2022	91	FCF1-BH121	0-0.1	A	–	Fragment							X					
14/07/2022	92	FCF1-BH122	0-0.1	A	–	Fragment												
14/07/2022	93	FCF2-BH122	0-0.1	A	–	Fragment												
14/07/2022	94	FCF3-BH122	0-0.1	A	–	Fragment							X					

Remarks (comments/detection limits required):
- Please send to Envirolab VIC

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

Relinquished By:	Date: 19.7.22	Time:	Received By:	Date:

Relinquished by EIS Syd
C. Maenze
20/7/22 1300
CM

360836
TJ
19.7.22

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES2227140**	Page	: 1 of 5
Amendment	: **1**		
Client	: **The trustee for Jeffery Katauskas Walker Unit Trust c/o-EIS**	Laboratory	: Environmental Division Sydney
Contact	: Michele Richard	Contact	: Customer Services ES
Address	: 115 WICKS ROAD MACQUARIE PARK NSW, AUSTRALIA 2113	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: E35073B	Date Samples Received	: 01-Aug-2022 17:40
Order number	: ----	Date Analysis Commenced	: 02-Aug-2022
C-O-C number	: ----	Issue Date	: 12-Aug-2022 13:45
Sampler	: ----		
Site	: ----		
Quote number	: SYBQ/298/16		
No. of samples received	: 1		
No. of samples analysed	: 1		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Amendment (12/08/2022)This WO has been amended to change Client name as per Michele. All analysis results are as per the previous report.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	WDUP2	----	----	----	----
				Sampling date / time	27-Jul-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2227140-001	--------	--------	--------	--------
					Result	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	WDUP2	----	----	----	----
				Sampling date / time	27-Jul-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2227140-001	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**100**	----	----	----	----
13C8-PFOA	----	0.02	%		**90.6**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%) Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2227140**	Page	: 1 of 4
Amendment	: **1**		
Client	: **The trustee for Jeffery Katauskas Walker Unit Trust c/o-EIS**	Laboratory	: Environmental Division Sydney
Contact	: Michele Richard	Telephone	: +61-2-8784 8555
Project	: E35073B	Date Samples Received	: 01-Aug-2022
Site	: ----	Issue Date	: 12-Aug-2022
Sampler	: ----	No. of samples received	: 1
Order number	: ----	No. of samples analysed	: 1

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
WDUP2	**27-Jul-2022**	**06-Aug-2022**	23-Jan-2023	✓	**06-Aug-2022**	23-Jan-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
WDUP2	**27-Jul-2022**	**06-Aug-2022**	23-Jan-2023	✓	**06-Aug-2022**	23-Jan-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
WDUP2	**27-Jul-2022**	**06-Aug-2022**	23-Jan-2023	✓	**06-Aug-2022**	23-Jan-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
WDUP2	**27-Jul-2022**	**06-Aug-2022**	23-Jan-2023	✓	**06-Aug-2022**	23-Jan-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
WDUP2	**27-Jul-2022**	**06-Aug-2022**	23-Jan-2023	✓	**06-Aug-2022**	23-Jan-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

QUALITY CONTROL REPORT

Work Order	: **ES2227140**	Page	: 1 of 7
Amendment	: **1**		
Client	: **The trustee for Jeffery Katauskas Walker Unit Trust c/o-EIS**	Laboratory	: Environmental Division Sydney
Contact	: Michele Richard	Contact	: Customer Services ES
Address	: 115 WICKS ROAD MACQUARIE PARK NSW, AUSTRALIA 2113	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: E35073B	Date Samples Received	: 01-Aug-2022
Order number	: ----	Date Analysis Commenced	: 02-Aug-2022
C-O-C number	: ----	Issue Date	: 12-Aug-2022
Sampler	: ----		
Site	: ----		
Quote number	: SYBQ/298/16		
No. of samples received	: 1		
No. of samples analysed	: 1		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4503823)									
ES2225506-003	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.04	0.03	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
ES2227140-001	WDUP2	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4503823)									
ES2225506-003	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.01	0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.04	0.04	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4503823) - continued									
ES2227140-001	WDUP2	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4503823)									
ES2225506-003	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
ES2227140-001	WDUP2	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4503823)									
ES2225506-003	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4503823) - continued									
ES2225506-003	Anonymous	EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
ES2227140-001	WDUP2	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4503823)									
ES2225506-003	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.13	0.12	8.0	0% - 50%
ES2227140-001	WDUP2	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4503823)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	98.6	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	123	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	123	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	121	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	121	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	112	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4503823)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	90.4	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	119	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	110	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	112	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	115	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	114	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	112	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	109	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	112	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	100	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	108	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4503823)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	119	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	96.2	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	94.3	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	95.9	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	93.0	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	127	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	116	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4503823)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	121	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	124	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	130	67.0	138

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4503823) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	90.4	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4503823)							
ES2227140-001	WDUP2	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	94.8	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	119	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	125	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	124	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	128	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	113	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4503823)							
ES2227140-001	WDUP2	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	96.6	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	125	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	128	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	125	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	119	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	105	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	106	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	107	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	101	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	90.2	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	114	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4503823)							
ES2227140-001	WDUP2	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	122	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	110	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	91.6	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	99.3	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	89.4	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	127	65.0	136

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4503823) - continued							
ES2227140-001	WDUP2	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	113	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4503823)							
ES2227140-001	WDUP2	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	128	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	127	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	121	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	95.0	71.4	144

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **ES2227140**

Client	: **CASH SALES SYDNEY**	Laboratory	: Environmental Division Sydney
Contact	: ALISTAIR MITCHELL	Contact	: Customer Services ES
Address	: 115 WICKS ROAD MACQUARIE PARK 2113	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: amitchell@jkenvironments.com.au	E-mail	: ALSEnviro.Sydney@ALSGlobal.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: E35073B	Page	: 1 of 2
Order number	: ----	Quote number	: ES2020CASHSYD0001 (Blanket Quote)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	:		

Dates

Date Samples Received	: 01-Aug-2022 17:40	Issue Date	: 02-Aug-2022
Client Requested Due Date	: 09-Aug-2022	Scheduled Reporting Date	: **09-Aug-2022**

Delivery Details

Mode of Delivery	: Undefined	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 13.8'C - Ice Bricks present
Receipt Detail	:	No. of samples received / analysed	: 1 / 1

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)
ES2227140-001	27-Jul-2022 00:00	WDUP2	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

ALISTAIR MITCHELL

- *AU Certificate of Analysis - NATA (COA)	Email	amitchell@jkenvironments.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	amitchell@jkenvironments.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	amitchell@jkenvironments.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	amitchell@jkenvironments.com.au
- A4 - AU Tax Invoice (INV)	Email	amitchell@jkenvironments.com.au
- Chain of Custody (CoC) (COC)	Email	amitchell@jkenvironments.com.au
- EDI Format - ESDAT (ESDAT)	Email	amitchell@jkenvironments.com.au

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: E35073B 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: Alistair Mitchell amitchell@jkenvironments.com.au

Location:	Parramatta	Sample Preserved in Esky on Ice
Sampler:	AD/NF	Tests Required

Date Sampled	Lab Ref:	Sample Number	Sample Containers	PID	Sample Description	Combo 3L	PFAS (Trace Level - extended)	VOCs	pH / EC/suphate/ chloride	BTEX							
27/07/2022	1	MW1	G1x2, Vx4, Px2, H, PVC	3.5	Water	X	X	X	X								
27/07/2022	2	MW3	G1x2, Vx4, Px2, H, PVC	2.6	Water	X	X	X	X								
27/07/2022	3	MW6	G1x2, Vx4, Px2, H, PVC	41.5	Water	X	X	X	X								
27/07/2022	4	WDUP1	G1x2, Vx4, Px2, H	–	Duplicate	X	X	X									
27/07/2022	5	WDUP2	G1x2, Vx4, Px2, H	–	Duplicate	X	X	X	- melb								
27/07/2022	6	TB-W1	V	–	Trip Blank melbs		ALS			X							
27/07/2022	7	TS-W1	V	–	Trip Spike					X							
27/07/2022	8	FR	Vx2	–	Field Rinsate					X							
	9	unlabeled															

Environmental Division
Sydney
Work Order Reference
ES2227140

Telephone - 61-2-8784 8555

ENVIROLAB

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

Job No: 301640
Date Received: 28.7.22
Time Received: 1230
Received By: AP
Temp: Cool/Ambient 12.0
Cooling: Ice/Icepack
Security: Intact/Broken/None

Remarks (comments/detection limits required):	Sample Containers:
All analysis PQLs to ANZECC (2000) Detection Limits Please	G1 - 500mL Amber Glass Bottle G2 - 1L Amber Glass Bottle V - BTEX Vial H - HNO3 Wash PVC PVC - HDPE Plastic Bottles P - PFAS Bottle

Relinquished By:	Date: 27-07-2022	Time: 5PM	Received By:	Date: 28/7/22
			AP ELS SYD	1230

(1)

Relinquished by: ELS Sydney
C. McKenzie
21/8/22 1200
CM

Rec: J CM 01/08/22 1740

Aileen Hie

From: Alistair Mitchell <AMitchell@jkenvironments.com.au>
Sent: Friday, 29 July 2022 3:26 PM
To: Aileen Hie
Subject: RE: E35073B (ELS 301640)

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.

Ahh yes. Can you send the PFAS sample to ALS please?

Relinquished by ELS Sydney C. McKenzie. 1/8/22 1200 CM

Thanks,

Regards
Alistair Mitchell
Environmental Scientist

T: +612 9888 5000
D: 0421 687 953
E: AMitchell@jkenvironments.com.au
www.jkenvironments.com.au

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

JKEnvironments

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From: Aileen Hie <AHie@envirolab.com.au>
Sent: Friday, 29 July 2022 3:23 PM
To: Alistair Mitchell <AMitchell@jkenvironments.com.au>
Subject: RE: E35073B (ELS 301640)

Ok. They may not be able to do trace PFAS though

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

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

From: Alistair Mitchell <AMitchell@jkenvironments.com.au>
Sent: Friday, 29 July 2022 2:34 PM
To: Aileen Hie <AHie@envirolab.com.au>
Subject: RE: E35073B (ELS 301640)

Rec'd J Clotta 01/08/22 17:00

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 Aileen,

Relinquished by ELS 1440
1/8/22 1200

Yes, can you send WDUP2 off to Melbourne please?

Thanks!

Regards
Alistair Mitchell
Environmental Scientist

T: +612 9888 5000
D: 0421 687 953
E: AMitchell@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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From: Aileen Hie <AHie@envirolab.com.au>
Sent: Friday, 29 July 2022 2:29 PM
To: Alistair Mitchell <AMitchell@jkenvironments.com.au>
Subject: E35073B (ELS 301640)

Hi Alistair

Should 1 of the Dup's be an interlab sample?

Kind Regards,

Aileen Hie | Customer Service Supervisor | Envirolab Services

Great Science. Great Service.

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

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Rec'd 01/08/22 1740

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)[28] methods and those described in *Environmental Sampling and Analysis, A Practical Guide,* (1991)[29]. 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;

[28] US EPA, (1994). *SW-846: Test Methods for Evaluating Solid Waste, Physical/Chemical Methods.* (US EPA SW-846)

[29] Keith., H, (1991). *Environmental Sampling and Analysis, A Practical Guide*

- All laboratory duplicate and RPDs calculated;
- All surrogate spike data reported;
- All matrix spike and lab control spike (LCS) data reported and RPDs calculated;
- Spike recovery acceptable limits reported; and
- NATA stamp on reports.

F. Comparability

Comparability is the evaluation of the similarity of conditions (e.g. sample depth, sample homogeneity) under which separate sets of data are produced. Data comparability checks include a bias assessment that may arise from the following sources:

- Collection and analysis of samples by different personnel; Use of different techniques;
- Collection and analysis by the same personnel using the same methods but at different times; and
- Spatial and temporal changes (due to environmental dynamics).

G. Blanks

The purpose of laboratory and field blanks is to check for artefacts and interferences that may arise during sampling, transport and analysis.

H. Matrix Spikes

Samples are spiked with laboratory grade standards to detect interactive effects between the sample matrix and the analytes being measured. Matrix Spikes are reported as a percent recovery and are prepared for 1 in every 20 samples. Sample batches that contain less than 20 samples may be reported with a Matrix Spike from another batch. The percent recovery is calculated using the formula below. Acceptable recovery limits are 70% to 130%.

$$\frac{\text{(Spike Sample Result – Sample Result) x 100}}{\text{Concentration of Spike Added}}$$

I. Surrogate Spikes

Samples are spiked with a known concentration of compounds that are chemically related to the analyte being investigated but unlikely to be detected in the environment. The purpose of the Surrogate Spikes is to check the accuracy of the analytical technique. Surrogate Spikes are reported as percent recovery.

J. Duplicates

Laboratory duplicates measure precision, expressed as Relative Percent Difference. Duplicates are prepared from a single field sample and analysed as two separate extraction procedures in the laboratory. The RPD is calculated using the formula where D1 is the sample concentration and D2 is the duplicate sample concentration:

$$\frac{(D1 - D2) \times 100}{\{(D1 + D2)/2\}}$$

Background on Salinity

A. General Information on Salinity

Salinity is the accumulation and concentration of salt at or near the ground surface or within surface water bodies. Salt is naturally present in the landscape through deposition of salt from the ocean in coastal areas and through weathering of bedrock that contains salt, accumulated during deposition of original sediments in a prehistoric marine environment. The salts are commonly soluble chlorides, sulphates or carbonates of sodium and magnesium.

In Sydney, salinity issues are typically associated with the Wianamatta Group shales and their derived soil landscapes. The natural vegetation of western Sydney is dominated by large isolated trees with deep root systems that remove subsurface moisture. Slow rates of percolation through the relatively impermeable clay soil and uptake of a large proportion of rainfall by the trees results in limited recharge of the groundwater system by rainfall. The depth to groundwater has developed a natural equilibrium and there is little tendency for salt contained in the groundwater or subsoils to rise to the surface.

B. Salinity and Urban Development

Salinity becomes a problem in urban areas when changes in the land use result in changes to the way water moves through the environment. This can result in vegetation die-back, decrease in water quality and damage to urban infrastructure.

Removal of deep rooted tree species during development and replacement with urban infrastructure, houses and industrial developments reduces the mechanism for the removal of subsurface moisture.

The development of urban salinity is commonly associated with changes in the hydrological cycle through the environment (rainfall, surface run-off, water infiltration and groundwater system). An increase in the quantity of water reaching the groundwater table as a result of vegetation clearance, irrigation of parklands, leaking water infrastructure and changes in drainage patterns, can cause a relatively rapid rise in the groundwater table. Earthworks that include excavation of natural soil profiles and exposure of more saline subsurface soils or shale bedrock may also result in an increase in salt concentrations at the ground surface.

Construction of roads, pipelines and buildings commonly results in removal of topsoil leading to exposure of the subsoils and interception of surficial and shallow subsurface drainage. In addition, over-irrigation of urban gardens, leaking water infrastructure and concentrated drainage patterns can result in increased water movement through the subsoil to the groundwater system leading to a relatively rapid rise in the groundwater table.

A rise in groundwater levels and impediments to subsurface drainage patterns can transport salt formerly stored in the bedrock to the surficial soil profile. This may result in salt encrustation of exposed soils, building foundations, roads, drainage infrastructure and corrosion of metal, concrete and other building materials. Increasing salt concentrations in surficial soils (and consequently in surface waters) may also result in die-off of the existing vegetation, further reducing the hydrological load on the groundwater system and resulting in further groundwater table rises.

C. Potential Salinity Impacts on Urban Development

Some of the adverse impacts that can arise from saline conditions include:

- Salt scalds caused by a rise in the subsoil moisture content that mobilises salt to the ground surface;
- Salt scalds caused by modification of former drainage patterns which leads to the day lighting of subsurface seepage (either perched water or groundwater) in areas lower in the catchment, either at breaks in the slope or within drainage lines;
- A rise in groundwater table or accumulation of salt rich seepage leading to corrosion of subsurface facilities including concrete structures, metal pipework, cables, foundations, underground services, etc;
- Rising damp, where salt rich moisture is drawn into building and pavement materials by capillary action leading to deterioration of brick, mortar and concrete;
- Structural cracking, damage or building collapse which may occur as a result of shifting and or sinking foundations;
- Plant die-back associated with a rise in groundwater table level that mobilises excess salt to the plant root zone; and
- Subsurface water discharge and subsequent pollution of streams and drainage channels.

D. Soils and Groundwater Planning Strategy in Western Sydney

The aim of the DLWC 2002 document is to provide a framework for the sustainable development and management of new developments in the western region of Sydney. In relation to salinity management, the development should be designed and constructed such that there is no significant increase in the water table level and no adverse salinity impacts.

The proposed development controls that relate to soils and groundwater issues are summarised below:

1. A water management strategy should be prepared to address the following:
    - Reduction of potable water usage onsite;
    - Development of best practice measures for stormwater reuse for open space irrigation;
    - Reduction of potable water demand;
    - Reduction of adverse impacts on local groundwater regimes;
    - Reduction of change in local flow regimes; and
    - Preparation of water maintenance and a monitoring management system.
2. A salinity management plan should be prepared that includes a groundwater management strategy related to:
    - Adoption of small landscaped areas to reduce irrigation requirements;
    - Use of native and other low water requirement plants;
    - Use of mulch cover (not in drainage lines);
    - Use of low flow watering facilities for landscaped areas;
    - Implementation of a tree planting program, especially in high recharge areas, of native, deep rooted, large growing species to assist retention of the groundwater at existing levels;
    - Retention of existing native tree cover where possible; and
    - Not permitting infiltration pits or tanks to disperse surface water.

3. An assessment of soil and rock conditions at the site, including erosion, expansive and dispersive soil conditions, and plant growth potential should be undertaken.

Use of the Blue Book (2004) as a guide to prepare soil and water management plans. The approved plan and subsequent works are to be supervised by appropriately qualified experienced personnel.

Information on Acid Sulfate Soils

A. Background

Acid Sulfate Soil (ASS) is formed from iron rich alluvial sediments and sulfate (found in seawater) in the presence of sulfate reducing bacteria and plentiful organic matter. These conditions are generally found in mangroves, salt marsh vegetation or tidal areas and at the bottom of coastal rivers and lakes. ASS materials are distinguished from other soil or sediment materials (referred to as 'soil materials' throughout the National Acid Sulfate Soils Guidance) by having properties and behaviour that have either:

1) Been affected considerably by the oxidation of Reduced Inorganic Sulfur (RIS), or
2) The capacity to be affected considerably by the oxidation of their RIS constituents.

Acid sulfate soil materials include potential acid sulfate soils (PASS or sulfidic soil materials) and actual acid sulfate soils (AASS or sulfuric soil materials). These are often found in the same profile, with AASS overlying PASS. PASS and AASS are defined further below:

- PASS are soil materials which contain RIS such as pyrite. The field pH of these soils in their undisturbed state is usually more than pH 4 and is commonly neutral to alkaline (pH 7–9). These soil materials are invariably saturated with water in their natural state. Their texture may be peat, clay, loam, silt or sand and is often dark grey in colour and soft in consistence, but these materials may also exhibit colours that are dark brown, or medium to pale grey to white; and
- AASS are soil materials which contained RIS such as pyrite that have undergone oxidation. This oxidation results in low pH (that is pH less than 4) and often a yellow (jarosite) and/or orange to red mottling (ferric iron oxides) in the soil profile. Actual ASS contains Actual Acidity, and commonly also contains RIS (the source of Potential Sulfuric Acidity) as well as Retained Acidity.

B. The ASS Planning Maps

The ASS planning maps provide an indication of the relative potential for disturbance of ASS to occur at locations within the council area. These maps do not provide an indication of the actual occurrence of ASS at a site or the likely severity of the conditions.

The maps are divided into five classes dependent upon the type of activities/works that if undertaken, may represent an environmental risk through the development of acidic conditions associated with ASS. The classes are outlined in Table B1.

Table B1: Risk Classes

Risk Class	Description
Class 1	All works.
Class 2	All works below existing ground level and works by which the water table is likely to be lowered.
Class 3	Works at depths beyond 1m below existing ground level or works by which the water table is likely to be lowered beyond 1m below existing ground level.
Class 4	Works at depths beyond 2m below existing ground level or works by which the water table is likely to be lowered beyond 2m below existing ground level.
Class 5	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 land.

C. The ASS Risk Maps

The ASS risk maps provide an indication of the probability of occurrence of ASS materials at a particular location based on interpretation from geological and soil landscape maps. The maps provide classes based on high probability, low probability, no known occurrence and areas of disturbed terrain (site specific assessment necessary) and the likely depth at which ASS materials are likely to be encountered.

D. Interpretation of ASS Field Tests

Tables D1 and D2 below provide some guidance on the interpretation of pH_F and pH_{FOX} test results, as detailed in the *National Acid Sulfate Soil Guidance: National acid sulfate soils sampling and identification methods manual* (2018):

Table D1: Interpretation of some pH_F test ranges

pH value	Result	Comments
$pH_F \leq 4$, jarosite not observed in the soil layer/horizon	May indicate an AASS indicating previous oxidation of RIS or may indicate naturally occurring, non ASS soils.	Generally not conclusive as naturally occurring, non ASS soils, such as many organic soils (for example peats) and heavily leached soils, often also return $pH_F \leq 4$.
$pH_F \leq 4$, jarosite observed in the soil layer/horizon	The soil material is an AASS.	Jarosite and other iron precipitate minerals in ASS such as schwertmannite require a pH < 4 to form and indicate prior oxidation of RIS.
$pH_F > 7$	Expected in waterlogged, unoxidised, or poorly drained soils.	Marine muds commonly have a pH > 7 which reflects a seawater (pH 8.2) influence. Oxidation of samples with H_2O_2 can help indicate if the soil materials contain RIS.

Source: Adapted from DER (2015a).

Table D2: Interpretation of pH_{FOX} test results

pH value and reaction	Result	Comments
Strong reaction of soil with H_2O_2 (that is X or V)	Useful indicator of the presence of RIS but cannot be used alone	Organic rich substrates such as peat and coffee rock, and soil constituents like manganese oxides, can also cause a reaction. Care must be exercised in interpreting these results. Laboratory analyses are required to confirm if appreciable RIS is present.
pH_{FOX} value at least one unit below field pH_F and strong reaction with H_2O_2 (that is X or V)	May indicate PASS	The difference between pH_F and pH_{FOX} is termed the ΔpH. Generally the larger the ΔpH the more indicative of PASS. The lower the final pH_{FOX} the better the likelihood of an appreciable RIS content. For example, a change from pH_F of 8 to pH_{FOX} of 7 (that is a ΔpH of 1) would not indicate PASS, however, a unit change from pH_F of 3.5 to pH_{FOX} of 2.5 would be indicative of PASS. Laboratory analyses are required to confirm if appreciable RIS is present.
pH_{FOX} < 3, large ΔpH and a strong reaction with H_2O_2 (that is X or V)	Strongly indicates PASS	The lower the pH_{FOX} below 3, the greater the likelihood that appreciable RIS is present. A combination of all three parameters – pH_{FOX}, ΔpH and reaction strength – gives the best indication of PASS. Laboratory analyses are required to confirm that appreciable RIS is present.
A pH_{FOX} 3–4 and Low, Medium or Strong reaction with H_2O_2	Inconclusive	RIS may be present; however, organic matter may also be responsible for the decrease in pH. Laboratory analyses are required to confirm the presence of RIS.
pH_{FOX} 4–5	Inconclusive	RIS may be present in small quantities, or poorly reactive under rapid oxidation, or the sample may contain shell/ carbonate which neutralises some or all acid produced on oxidation. Equally, the pH_{FOX} value may be due to the production of organic acids with no RIS present. Laboratory analyses are required to confirm if appreciable RIS is present.
pH_{FOX} > 5, small or no ΔpH, but Low, Medium or Strong reaction with H_2O_2	Inconclusive	For neutral to alkaline pHF with shell or white concretions, the fizz test with 1 M HCl can be used to identify the presence of carbonates. Laboratory analyses are required to confirm if appreciable RIS is present and further testing is required to confirm that effective self-neutralising materials are present.

Source: Adapted from DER (2015a).

Appendix G: Data (QA/QC) Evaluation

Data (QA/QC) Evaluation

A. INTRODUCTION

Checks were made to assess the data in terms of precision, accuracy, representativeness, comparability and completeness. These 'PARCC' parameters are referred to collectively as DQIs and are defined in the Report Explanatory Notes attached in the report appendices.

1. Field and Laboratory Considerations

The quality of the analytical data produced for this project has been considered in relation to the following:

- Sample collection, storage, transport and analysis;
- Laboratory PQLs;
- Field QA/QC results; and
- Laboratory QA/QC results.

2. Field QA/QC Samples and Analysis

The results for the field QA/QC samples are detailed in the laboratory summary tables (Table Q1 to Table Q4 inclusive) attached to the investigation report and are discussed in the subsequent sections of this Data (QA/QC) Evaluation report. A summary of the field QA/QC samples collected and analysed for this investigation is provided in the following table:

Sample Type	Number Analysed	Frequency (of Sample Type)
Intra-laboratory duplicate (soil)	3	Approximately 10% of primary samples.
Inter-laboratory duplicate (soil)	2	Approximately 5% of primary samples
Intra-laboratory duplicate (groundwater)	1	Approximately 35% of primary samples.
Inter-laboratory duplicate (groundwater)	1	Approximately 35% of primary samples.
Trip spikes Soil Water	 2 1	Two soil spikes and one water spike for the investigation to demonstrate adequacy of preservation, storage and transport methods.
Trip blanks Soil Water	 2 1	Two soil blanks and one water blank for the investigation to demonstrate adequacy of storage and transport methods.
Rinsate Soil sampling equipment Groundwater sampling equipment	 2 1	Two soil equipment and one water sampling equipment rinsate samples for the investigation to demonstrate adequacy of decontamination methods.

3. Data Assessment Criteria

JKG 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.

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%.

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. DATA EVALUATION

1. Sample Collection, Storage, Transport and Analysis

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. Laboratory analysis was undertaken generally within specified holding times generally in accordance with Schedule B(3) of NEPM (2013) and the laboratory NATA accredited methodologies. 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.

JKG note that the temperature on receipt of soil samples and groundwater samples at the primary laboratory was reported to be up to 14°C and 12°C respectively. On receipt of the soil and groundwater samples at the secondary laboratories, the temperatures were reported to be up to 11.3°C and 13.8°C respectively. JKG 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, JKG 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 81% to 118%.

The following holding time exceedances were reported:

- *Envirolab Report 300836-A:* Holding time exceedances were reported for pH and EC analysis for six soil samples. The analysis was undertaken less than one week beyond the holding time. The minor exceedance of the holding time was associated with temporary storage of the samples at JKG office. JKG note that the pH and EC analysis was primarily scheduled for the assessment of dryland salinity potential and that the samples were stored under appropriate conditions and considerable changes in the physiochemistry of the samples is unlikely to have occurred during the minor holding time exceedance. On this basis, JKG consider the pH and EC results is sufficiently reliable for the purpose of this investigation; and
- *Envirolab Report 301048-A:* A holding time exceedance was reported for one sample, being the TRH silica gel clean-up analysis of the soil sample collected from BH123 (0-0.1m). The analysis was undertaken approximately two weeks beyond the recommended holding time. JKG note that this analysis was undertaken on a staged approach based on the initial results, which was the reason for the delay in analysis. JKG note that the sample was stored under appropriate laboratory conditions and is of the opinion that considerable degradation of the sample is unlikely to have occurred during the minor holding time exceedance. On this basis, JKG consider that the TRH silica gel clean-up data is sufficiently reliable for the purpose of this investigation. JKG note that following the silica gel clean-up process, the reported TRH F2 concentrations were still above the respective SAC and did not affect the outcome of this investigation.

- COC documentation was adequately maintained;
- Sample receipt advice documentation was provided for all sample batches;
- All analytical results were reported; and
- Consistent units were used to report the analysis results.

2. Laboratory PQLs

Appropriate PQLs were adopted for the analysis and all PQLs were below the SAC with the exception of the vinyl chloride PQL for groundwater which was approximately three times greater than the recreational SAC, and the anthracene PQL for groundwater analysis which was 10 times greater than the ecological SAC. In light of the PAH concentrations reported for soil and groundwater, and the VOC concentrations reported for groundwater, JKG is of the opinion that this is not significant, and it does not affect the quality of the dataset as a whole or the outcome of the investigation.

3. Field QA/QC Sample Results

Field Duplicates

The results indicated that field precision was acceptable. RPD non-conformances were reported for some analytes as discussed below:

- Elevated RPDs were reported for copper, nickel, zinc and several PAH compounds in SDUP1/BH1 (0-0.1m);
- Elevated RPDs were reported for two PAH compounds and several heavy metals in SDUP2/BH112 (0-0.1m);
- Elevated RPDs were reported for perfluorodecanoic acid (a PFAS compound), and several PAH compounds and heavy metals in SDUP3/BH102 (0-0.1m);
- Elevated RPDs were reported for TRH F2 and F3, benzo(a)pyrene (a PAH compound), arsenic and mercury in SDUP4/BH108 (0-0.1m);
- An elevated RPD was reported for perfluorooctanoic acid (PFOA) in SDUP6/BH116 (0-0.1m);
- Elevated RPDs were reported for pyrene (a PAH compound) and three PFAS compounds in WDUP1/MW1; and
- Elevated RPDs were reported for two PAH compounds, zinc, and several PFAS compounds in WDUP2/MW3.

The RPD exceedances relating to heavy metals in soils have been attributed to sample heterogeneity and the difficulties associated with obtaining homogenous duplicate samples of heterogeneous matrices. As both the primary and duplicate sample results were less than the SAC, the exceedances are not considered to have had an adverse impact on the data set as a whole.

The RPD exceedances relating to PAH and PFAS compounds in soil, and all RPD exceedances in groundwater, have been attributed to low analyte concentrations approaching the PQL. In these circumstances, the RPDs are considered acceptable.

Trip Blanks

During the investigation, two soil trip blanks and one water trip blank were placed in the eskies during sampling and transported back to the laboratory.

The soil trip blank results were all less than the PQLs, therefore cross contamination between samples that may have significance for data validity did not occur.

The water trip blank analysis results were all less than the PQLs with the exception of TRH F1 with a reported concentration of 38µg/L. 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).

Rinsates

All soil rinsate results were below the PQLs. This indicated that cross-contamination artefacts associated with sampling equipment were not present and the potential for cross-contamination to have occurred was low.

The water rinsate results were all less than the PQLs with the exception of TRH F1 with a reported concentration of 70µg/L. JKG was informed by the analytical laboratory that trihalomethanes were encountered within the sample, associated with the use of potable water in the rinsate sample. JKG consider the light fraction TRH to be attributed to the trihalomethanes, and note that these compounds are common in potable water at the concentration reported.

Trip Spikes

The soil trip spike results ranged from 81% to 98% and the water trip spike results ranged from 105% to 118%. The results indicated that field preservation methods were appropriate.

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 300587:

- An RPD exceedance was reported for lead in one soil sample collected from BH1. The laboratory issued the exceedance as a triplicate result; and
- 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 outliers.

Envirolab Report 300836:

- An RPD exceedance was reported for zinc in one soil sample collected from BH110. The laboratory issued the exceedance as a triplicate result;
- Matrix spike recovery for zinc in one soil sample collected from BH116 was not possible due to the inhomogeneous nature of the sample. Envirolab noted that an acceptable recovery was obtained for the LCS;

- 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 outliers.

Envirolab Report 300836-A:

- Matrix spike recovery for sulphate in one soil sample collected from BH7 was not possible due to the high analyte concentration recorded. Envirolab noted that an acceptable recovery was obtained for the LCS.

Envirolab Report 301640:

- 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 outliers.

C. DATA QUALITY SUMMARY

JKG is of the opinion that the data are adequately precise, accurate, representative, comparable and complete to serve as a basis for interpretation to achieve the investigation objectives.

Non-conformances were reported for some field QA/QC samples and laboratory QA/QC analysis. These non-conformances were considered to be sporadic and minor, and were not considered to be indicative of systematic sampling or analytical errors. On this basis, these non-conformances are not considered to materially impact the report findings.

There was only one groundwater monitoring event undertaken for the investigation. On this basis there is some uncertainty around the representativeness of the groundwater data, particularly during different climatic conditions and after wet/dry periods. However, given the low contaminant concentrations reported, the site history and the surrounding land uses, this is not considered to alter the conclusions of the investigation.

Appendix H: Field Work Documents

JKEnvironments

WATER QUALITY METER CALIBRATION FORM

Client:	School Infrastructure NSW		
Project:	Proposed School Upgrade		
Location:	Parramatta East Public School, PARRAMATTA, NSW		
Job Number:	E35073B		
DISSOLVED OXYGEN			
Make: YSI-5		Model:	
Date of calibration: 27/7/22		Name of Calibrator: NF	
Span value: 70% to 130%			
Measured value: 93			
Measured reading Acceptable (Yes)/No):			
pH			
Make: YSI-5		Model:	
Date of calibration: 27/7/22		Name of Calibrator: NF	
Buffer 1: Theoretical pH = 7.01± 0.01		Expiry date: 06/23	Lot No: 384001
Buffer 2: Theoretical pH = 4.01± 0.01		Expiry date: 06/23	Lot No: 380832
Measured reading of Buffer 1: 7.14			
Measured reading of Buffer 2: 3.95			
Slope:		Measured reading Acceptable (Yes)/No):	
EC			
Make: YSI-C		Model:	
Date: 27/7	Name of Calibrator: NF		Temperature: 10.8 °C
Calibration solution: Conductivity Standard		Expiry date: 12/23	Lot No: 381243
Theoretical conductivity at temperature (see solution container): 1035 µS/cm			
Measured conductivity: 1029 µS/cm		Measured reading Acceptable (Yes)/No):	
REDOX			
Make: YSI-5		Model:	
Date of calibration: 27/7		Name of Calibrator: NF	
Calibration solution: ORP Test Solution		Expiry date: 1/27	Lot No: 7352
Theoretical redox value: 240mV			
Measured redox reading: 233.6 mV		Measured reading Acceptable (Yes)/No):	

100.2

JKEnvironments

PID FIELD CALIBRATION FORM

Client:	School Infrastructure NSW
Project:	Proposed School Upgrade
Location:	Parramatta East Public School, PARRAMATTA, NSW
Job Number:	E35073B

PID

Make: MiniRaeLite	Model: PGM7350	Unit: Green PID [illegible]	Date of last factory calibration: 13/05/22
Date of calibration: 19/07/22		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):			

PID

Make: MiniRaeLite	Model: PGM7350	Unit: Green PID	Date of last factory calibration: 13/05/22
Date of calibration: 21/07/22		Name of Calibrator: AD	
Calibration gas: Iso-butylene		Calibration Gas Concentration:	100.0 ppm
Measured reading: 100.5 ppm		Error in measured reading: ±	ppm
Measured reading Acceptable (Yes/No):			

PID

Make: MiniRaeLite	Model: PGM7350	Unit: Green PID	Date of last factory calibration: 13/05/22
Date of calibration: 27/7/22		Name of Calibrator: ~~Alexis~~ AD.	
Calibration gas: Iso-butylene		Calibration Gas Concentration:	100.0 ppm
Measured reading: 100.2 ppm		Error in measured reading: ±	ppm
Measured reading Acceptable (Yes/No):			

PID

Make:	Model:	Unit:	Date of last factory calibration:
Date of calibration:		Name of Calibrator:	
Calibration gas: Iso-butylene		Calibration Gas Concentration:	100.0 ppm
Measured reading: ppm		Error in measured reading: ±	ppm
Measured reading Acceptable (Yes/No):			

PID

Make:	Model:	Unit:	Date of last factory calibration:
Date of calibration:		Name of Calibrator:	
Calibration gas: Iso-butylene		Calibration Gas Concentration:	100.0 ppm
Measured reading: ppm		Error in measured reading: ±	ppm
Measured reading Acceptable (Yes/No):			

JKEnvironments

Client:	School Infrastructure NSW	**Job No.:**	E35073B
Project:	Proposed School Upgrade	**Well No.:**	MW1
Location:	Parramatta East Public School, PARRAMATTA, NSW	**Depth (m):**	5.5m

WELL FINISH

✓	**Gatic Cover**		**Standpipe**		**Other (describe)**

WELL PURGE DETAILS:

Method:	Peristaltic Pump	**SWL – Before:**	3.27
Date:	27/7/22	**Time – Before:**	7:50 am
Undertaken By:	NF/AD	**Total Vol Removed:**	11.5
Pump Program No:	Low	**PID (ppm):**	3.5

PURGING / SAMPLING MEASUREMENTS

Time (min)	SWL (m)	Vol (L)	Notes	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
8:07am	3.44	0.5L		15.1	3.5	914	4.79	110.1
8:11	3.49	1		15	2.6	908	4.72	100.9
8:15	3.58	1.5		15.2	3.7	910	4.71	92.7
8:19	3.6	2		14.8	2.2	904	4.72	87.7
8:23	3.64	2.5		14.7	2.3	898	4.72	83.4
8:27	3.7	3		14.9	2.2	901	4.72	78.7
8:31	3.73	3.5		14.9	2.1	902	4.73	75.4
8:35	3.77	4		15.0	2.1	905	4.74	72.2
8:39	3.81	4.5		15	2.0	906	4.79	69.4
8:43	3.86	5		15	2.0	907	4.82	67.4
8:47	3.88	5.5		14.9	2.1	906	4.87	65.1
8:51	3.92	6		14.9	2.0	908	4.92	63.0
8:55	3.96	6.5		14.9	2.0	909	4.95	61.0
8:59	4.00	7.0		15.0	2.0	912	4.97	59.4
9:03	9.04	7.5		15.0	2.0	916	5.00	57.4
9:07	4.9	8		15.0	2.0	917	5.03	55.7
9:11am	4.12	8.5		15.1	2.0	920	5.06	54.4
9:15	4.15	9		15.1	2.3	924	5.07	52.4
9:19	4.18	9.5		15.0	2.1	923	5.09	51.0
9:23	4.21	10		15.1	2.0	926	5.07	~~51.3~~ 51.3
9:27	4.28	10.5		15.8	2.1	944	5.08	49.8
9:31	4.36	11		16.0	2.0	954	5.12	48.6
9:35	4.45	11.5		16.4	1.9	970	5.18	47.6
			Started sampling					

Comments: Odours (YES / (NO)), NAPL/PSH (YES / (NO)), Sheen (YES / (NO)), Steady State Achieved (YES / (NO))

Sampling Containers Used: 2x glass amber, 4x BTEX vials, 1x HNO3 plastic, ~~x H2SO4 plastic~~, 1 x unpreserved plastic ×2 PFAs

YSI used: WDUP1 ×2 Amber, 4x BTEX, ×1 HNO3 plastic ×2 PFAs

Tested By: ~~Alistair Mitchell~~ Natalie Froud	**Remarks:**
Date Tested: 27/7/22	- Steady state conditions
Checked By: VB	- difference in the pH less than 0.2 units, difference in conductivity less than 10%
Date: 9.09.2022	10% and SWL stable/not in drawdown

JKEnvironments

Client:	School Infrastructure NSW	**Job No.:**	E35073B
Project:	Proposed School Upgrade	**Well No.:**	MW3
Location:	Parramatta East Public School, PARRAMATTA, NSW	**Depth (m):**	6.1

WELL FINISH

X	Gatic Cover		Standpipe		Other (describe)

WELL PURGE DETAILS:

Method: P. Pump	Peristaltic Pump	**SWL – Before:**	2.6
Date: 27/7/22	27/7/22	**Time – Before:**	12:10pm
Undertaken By: NF/AD	AD/NF	**Total Vol Removed:**	7L
Pump Program No:		**PID (ppm):**	0.9

6.1
2.6
10.5

PURGING / SAMPLING MEASUREMENTS

Time (min)	SWL (m)	Vol (L)	Notes	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
12:25	2.75	0.5		17.4	2.2	152.0	4.90	32.5
12:29	~~2.95~~	1		18	1.2	153.6	4.8	32.5
12:33	3.04	1.5		18.1	0.9	154.2	4.75	31.3
12:37	3.14	2		18.1	0.8	154.4	4.72	29.5
12:41	3.21	2.5		18	0.9	154.4	4.72	28.4
12:45	3.26	3		18.1	1.4	154.4	4.72	27.5
12:49	3.31	3.5		18.1	0.9	154.4	4.72	26
12:53	3.33	4		18.1	0.8	154.8	4.72	25.0
12:57	3.35	5		18.2	0.8	154.8	4.71	24.1
1:01	3.35	5.5		18	0.7	154.6	4.72	23.7
1:05	3.35	6		17.8	1.0	154.0	4.75	23.1
1:09	3.35	6.5		17.9	0.9	154.3	4.74	23.3
1:13	3.35	7		18.0	0.8	155.0	4.74	23.1

Comments: Odours (YES / (NO)), NAPL/PSH (YES / (NO)), Sheen (YES / (NO)), Steady State Achieved (YES) / NO)

Sampling Containers Used: 2 x glass amber, 4 x BTEX vials, 1 x HNO3 plastic, x H2SO4 plastic, 1 x unpreserved plastic 2x PFAS

YSI used: WDUP2 2x Amber, 4x BTEX, 1x HNO_3 plastic ~~2x PFAS~~

Tested By: ~~Alistair Mitchell~~ NF/AD	**Remarks:**
Date Tested: 27/7/22	- Steady state conditions - difference in the pH less than 0.2 units, difference in conductivity less than 10%
Checked By: VB	10% and SWL stable/not in drawdown
Date: 9.09.2022	

JKEnvironments

Client:	School Infrastructure NSW	**Job No.:**	E35073B
Project:	Proposed School Upgrade	**Well No.:**	MW6
Location:	Parramatta East Public School, PARRAMATTA, NSW	**Depth (m):**	3.7m

WELL FINISH

X	Gatic Cover		Standpipe		Other (describe)

WELL PURGE DETAILS:

Method:	Peristaltic Pump	**SWL – Before:**	2.76m
Date:	27/07/22	**Time – Before:**	10:30am
Undertaken By:	AD/NF	**Total Vol Removed:**	1L
Pump Program No:		**PID (ppm):**	41.5

PURGING / SAMPLING MEASUREMENTS

Time (min)	SWL (m)	Vol (L)	Notes	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
10:47am	2.83	0.5		17.2	5.1	1564	5.07	111.1
10:51	3	1		17.5	4.9	1578	5.05	103.0

Comments: Odours (YES / (NO)), NAPL/PSH (YES / (NO)), Sheen (YES / (NO)), Steady State Achieved (YES / (NO))

Sampling Containers Used: 2 x glass amber, 4 x BTEX vials, | x HNO3 plastic, ~~x H2SO4 plastic~~, | x unpreserved plastic 2×PFAs

YSI used:

Tested By: ~~Alistair Mitchell~~ Natalie Froud, Alexis Diadati

Date Tested: 27/7/22

Checked By: VB

Date: 9.09.2022

Remarks:

- Steady state conditions
- difference in the pH less than 0.2 units, difference in conductivity less than 10%
10% and SWL stable/not in drawdown

JKEnvironments

WATER QUALITY METER CALIBRATION FORM

Client:	School Infrastructure NSW		
Project:	Proposed School Upgrade		
Location:	Parramatta East Public School, PARRAMATTA, NSW		
Job Number:	E35073B		
DISSOLVED OXYGEN			
Make: YSI S	Model:		
Date of calibration: 20/07/22	Name of Calibrator: NF/AD		
Span value: 70% to 130%			
Measured value: 107%			
Measured reading Acceptable (Yes/No):			
pH			
Make: YSI S	Model:		
Date of calibration: 20/07/22	Name of Calibrator: NF/AD		
Buffer 1: Theoretical pH = 7.01± 0.01	Expiry date: 06/23	Lot No: 372831	
Buffer 2: Theoretical pH = 4.01± 0.01	Expiry date: 09/23	Lot No: 386479	
Measured reading of Buffer 1: 6.91			
Measured reading of Buffer 2: 4.03			
Slope:	Measured reading Acceptable (Yes/No):		
EC			
Make: YSI S	Model:		
Date: 20/07/22	Name of Calibrator: NF/AD	Temperature: 12.4 °C	
Calibration solution: Conductivity Standard	Expiry date: 09/23	Lot No: 386922	
Theoretical conductivity at temperature (see solution container): 1062 µS/cm			
Measured conductivity: 1069 µS/cm	Measured reading Acceptable (Yes/No):		
REDOX			
Make: YSI S	Model:		
Date of calibration: 20/07/22	Name of Calibrator: NF/AD		
Calibration solution: ORP Test Solution	Expiry date: 11/26	Lot No: 7221	
Theoretical redox value: 240mV			
Measured redox reading: 253.7 mV	Measured reading Acceptable (Yes/No):		

JKEnvironments

Client:	School Infrastructure NSW	Job No.:	E35073B
Project:	Proposed School Upgrade	Well No.:	MW1
Location:	Parramatta East Public School, PARRAMATTA, NSW	Depth (m):	5.5m

WELL FINISH DETAILS

	Gatic Cover ☒	Standpipe ☐	Other (describe) ☐

WELL DEVELOPMENT DETAILS

Method:	Development pump	SWL – Before (m):	3.65m
Date:	20/07/22	Time – Before:	8:46am
Undertaken By:	NF/AD	SWL – After (m):	Dry
Total Vol. Removed:	5L	Time – After:	8:55am
PID Reading (ppm):	2.4		

1-85m
5-5L ≈

Comments:

DEVELOPMENT MEASUREMENTS

Volume Removed (L)	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
1L	15.5	8.0	526	5.17	166.5
2L	17.7	3.5	997	4.97	158.8
3	18.1	2.9	996	4.96	156.2
4	18.2	2.8	1003	4.99	154.3
5	18.5	1.7	1046	5.20	150.3
		well dry			

Comments: Odours (YES / (NO)), NAPL/PSH (YES / (NO)), Sheen (YES / (NO)), Steady State Achieved (YES / (NO))

YSI Used: 5

Low recharge, high silt load

Tested By:	NF/AD	**Remarks:**
Date Tested:	20/07/22	- 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:	9.09.2022	

JKEnvironments

Client:	School Infrastructure NSW	**Job No.:**	E35073B
Project:	Proposed School Upgrade	**Well No.:**	MW3
Location:	Parramatta East Public School, PARRAMATTA, NSW	**Depth (m):**	6.1m

WELL FINISH DETAILS

	Gatic Cover ☒	Standpipe ☐	Other (describe) ☐

≈9.63

WELL DEVELOPMENT DETAILS

Method:	Development pump.	**SWL – Before (m):**	2.89m
Date:	20/7/22	**Time – Before:**	11:04am
Undertaken By:	NF/AD	**SWL – After (m):**	Dry
Total Vol. Removed:	9L	**Time – After:**	11:15am
PID Reading (ppm):	3.9		

Comments:

DEVELOPMENT MEASUREMENTS

Volume Removed (L)	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
1	18.7	2.7	164.4	5.13	15.2
2	19.5	0.9	164.8	5.03	16.3
3	19.5	0.8	168.0	5.04	16.7
4	19.2	1.1	166	5.08	16.6
5	19.1	1.3	166.0	5.10	16.6
6	19.2	1.1	180.4	5.02	17.7
7	19.4	0.8	208.3	5.06	18.8
8	19.7	1.1	199.0	5.11	17.2
9	19.8	0.9	180.0	5.10	16.7
			Well Dry		

Comments: Odours (YES / (NO)), NAPL/PSH (YES / (NO)), Sheen (YES / (NO)), Steady State Achieved (YES / (NO))

YSI Used: 5 Low recharge, high silt load

Tested By:	NF/AD
Date Tested:	20/07/22
Checked By:	VB
Date:	9.09.2022

Remarks:

- Steady state conditions
- Difference in the pH less than 0.2 units, difference in the conductiveity less than 10% and SWL stable/not in drawdown
- Minimum 3 monitoring well volumes purged, unless well purged until it is effectively dry

JKEnvironments

Client:	School Infrastructure NSW	**Job No.:**	E35073B
Project:	Proposed School Upgrade	**Well No.:**	MW6
Location:	Parramatta East Public School, PARRAMATTA, NSW	**Depth (m):**	3.7m

WELL FINISH DETAILS

	Gatic Cover ☒	Standpipe ☐	Other (describe) ☐

WELL DEVELOPMENT DETAILS

Method:	Bailer	**SWL – Before (m):**	2.81m
Date:	20/07/22	**Time – Before:**	10:36am
Undertaken By:	NF/AD	**SWL – After (m):**	well dry
Total Vol. Removed:	2.5L	**Time – After:**	10:49am
PID Reading (ppm):	29.6		

Comments:

DEVELOPMENT MEASUREMENTS

Volume Removed (L)	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
1	17.3	6.3	1194	6.69	38.8
1.5	17.7	5.3	1250	5.61	38.8
2.0	17.9	5.3	1321	5.35	38.9
2.5	18.0	5.1	1324	5.30	39.1
		well dry			

2.8
3.7m

Comments: Odours (YES / (NO)) NAPL/PSH (YES / (NO)) Sheen (YES / (NO)) Steady State Achieved (YES / (NO))

YSI Used: 5

Low recharge, high silt load

Tested By:	NF/AD
Date Tested:	20/07/22
Checked By:	VB
Date:	9.09.2022

Remarks:

- Steady state conditions
- Difference in the pH less than 0.2 units, difference in the conductiveity less than 10% and SWL stable/not in drawdown
- Minimum 3 monitoring well volumes purged, unless well purged until it is effectively dry

Appendix I: Guidelines and Reference Documents

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Appendix J: Sampling, Analysis & Quality Plan

APPENDIX J

REPORT TO

SCHOOLS INFRASTRUCTURE NSW

ON

SAMPLING, ANALYSIS AND QUALITY PLAN (SAQP)

FOR

DETAILED SITE CONTAMINATION INVESTIGATION

AT

PARRAMATTA EAST PUBLIC SCHOOL,

PARRAMATTA, NSW

Date: 12 July 2022

Ref: E35073Brpt2 - SAQP

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APPENDIX J

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Appendix C: Guidelines and Reference Documents

Abbreviations

Asbestos Fines/Fibrous Asbestos	**AF/FA**
Ambient Background Concentrations	**ABC**
Added Contaminant Limits	**ACL**
Asbestos Containing Material	**ACM**
Australian Drinking Water Guidelines	**ADWG**
Area of Environmental Concern	**AEC**
Australian Height Datum	**AHD**
Acid Sulfate Soil	**ASS**
Above-Ground Storage Tank	**AST**
Below Ground Level	**BGL**
Benzo(a)pyrene Toxicity Equivalent Factor	**BaP TEQ**
Bureau of Meteorology	**BOM**
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**
Dial Before You Dig	**DBYD**
Data Quality Indicator	**DQI**
Data Quality Objective	**DQO**
Detailed Site Investigation	**DSI**
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**
JK Geotechnics	**JKG**
Lab Control Spike	**LCS**
Light Non-Aqueous Phase Liquid	**LNAPL**
Map Grid of Australia	**MGA**
National Association of Testing Authorities	**NATA**
National Environmental Protection Measure	**NEPM**
Organochlorine Pesticides	**OCP**
Organophosphate Pesticides	**OPP**
Polycyclic Aromatic Hydrocarbons	**PAH**
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**

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**
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

Schools Infrastructure NSW ('the client') commissioned JK Geotechnics (JKG) to prepare a sampling analysis and quality plan (SAQP) for the detailed (stage 2) site contamination investigation (DSI) to be undertaken for the proposed school development at Parramatta East Public School (PEPS), Parramatta, NSW. The site location is shown on Figure 1 and the proposed sampling locations for the DSI is shown on Figure 2 attached in the appendices.

This report has been prepared to document the SAQP for the DSI. Any changes to the SAQP will be documented in the DSI report.

JKG have previously prepared a preliminary (stage 1) site contamination investigation (PSI) report for the proposed development (Ref: E35073Brpt, dated 11 July 2022)[1]. A summary of information relevant to this SAQP is included in Section 2. This report should be read in conjunction with the PSI report.

A geotechnical investigation will be undertaken in conjunction with the DSI.

1.1 Proposed Development Details

Based on the details provided, we understand that the proposed development is at conceptual design stage, includes demolition of the current buildings and construction of several one to two-storey buildings.

1.2 Aims and Objectives

The primary aim of the DGI is to characterise the soil and groundwater contamination conditions at the site. A secondary aim is to provide information on acid sulfate soil (ASS) conditions, dryland salinity conditions and preliminary waste classification information for the proposed development.

The DSI objectives are to:

- Review of previous PSI and SAQP reports;
- Assess the current site conditions and use(s) via a site walkover inspection;
- Assess the soil and groundwater contamination, ASS and dryland salinity conditions via implementation of the SAQP;
- Assess the potential risks posed by contamination to the receptors identified in the Conceptual Site Model (CSM) (Tier 1 assessment);
- Provide a preliminary waste classification for the in-situ soil;
- Assess the need for an ASS management plan (ASSMP) or salinity management plan (SMP) for the proposed development;
- 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] JKG, (2022). *Report to Schools Infrastructure NSW on Preliminary (Stage 1) Site Investigation for Proposed School Development at Parramatta East Public School, Parramatta, NSW*. (Report ref: E35073Brpt, dated 12 July 2022) (referred to as PSI)

1.3 Scope of Work

The SAQP was prepared generally in accordance with Section 3 of JKG proposal (Ref: EP56054Brev1) of 6 April 2022 and written acceptance from the client of 30 May 2022. The JKG proposal also included a scope to complete a Detailed Site Contamination Investigation (DSI) based on the results of the PSI. The results for the DSI will be presented in a separate report.

The scope of work for the SAQP included the following:

- Review of previous PSI report;
- Review of the CSM prepared for the site;
- Design and implementation of a sampling, analysis and quality plan (SAQP);
- Design the Site Assessment Criteria (SAC) to be used for the DSI;
- Design the Data Quality Assessment to be adopted for the DSI; and
- Preparation of the SAQP report.

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

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

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

2 SITE INFORMATION

2.1 Preliminary (Stage 1) Site Contamination Investigation (PSI)

JKG completed a PSI for the proposed development in July 2022. The purpose of the PSI was to make a preliminary assessment of site contamination. 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 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/areas of environmental concern (AEC) and contaminants of potential concern (CoPC);
- Prepare a conceptual site model (CSM); and
- Assess whether an intrusive investigation is required.

The scope of work for the PSI included the following:

- Review of site information, including background and site history information from various sources outlined in the report;
- A walkover site inspection; and
- Preparation of a PSI report presenting the results of the assessment, including a CSM.

A review of the site history information indicated the following land use at the site.

Year(s)	On-site - Potential Land Use / Activities	Off-site - Potential Land Use / Activities
1930-1943	Agricultural (grazing), subdivision and construction of residential properties within the southern section.	Agricultural (grazing) and residential subdivision.
1943-1970	Subdivision of the site with construction of both primary school buildings and residential properties.	Large scale residential subdivision of area. An electrical substation to the south west and three motor garage service stations to the south.
1970-1991	Primary school, demolition and clearing of southern residential properties into school playground area.	Residential, substation (south west) and motor garage service stations (south).
1994-2022	Primary school with construction of several new buildings and a playground.	Residential and substation (south west). Demolition of motor garages (south) with construction of commercial or high density residential.

Based on the scope of work undertaken for this PSI, the following potential contamination sources/AEC were identified:

- Historical filling of the site to achieve the existing levels;
- Historical agricultural use of the site;
- Use of pesticides beneath buildings and around the site; and

- Hazardous building materials present including a fibre cement fragment (FCF1) found onsite see Figure 2.

Considering the above, and based on a qualitative assessment of various lines of evidence as discussed in the PSI report, we are of the opinion that there is a potential for site contamination. Further investigation of the contamination conditions is considered to be required.

The site has been used for agricultural purposes which is listed in Table 1 of the SEPP55 Planning Guidelines as an activity that may cause contamination. On this basis, a detailed (Stage 2) site investigation (DSI) is required.

The PSI report concluded that the historical land uses and potential sources of contamination identified would not preclude the proposed development. The PSI report stated that the client had engaged JKG to undertake a DSI to better characterise the site contamination conditions and establish whether the site is suitable for the proposed development, or whether remediation is required.

Considering the timeframe in which several school buildings were constructed, the PSI recommended assessment of the buildings onsite with a hazardous building materials survey. This should be undertaken prior to demolition of the buildings. Following demolition of the buildings (and preferably prior to removal of the hardstand), an asbestos clearance certificate should be obtained by a Licensed Asbestos Assessor (LAA).

2.2 Site Identification

Table 2-1: Site Identification

Site Address:	Parramatta East Public School Parramatta NSW
Lot & Deposited Plan:	Lot 1 and 2 Section 59 in DP758788, Lot 1 and 2 DP188872, Lot A and B DP90685 and Lot 1,2 and 14 DP794926
Current Land Use:	Primary School
Proposed Land Use:	Primary School
Local Government Authority:	City of Parramatta Council
Current Zoning:	R3: Medium Density Residential
Site Area (m^2) (approx.):	17,700
RL (AHD in m) (approx.):	16 to 25
Geographical Location (decimal degrees) (approx.):	Latitude: -33.805887 Longitude: 151.017599
Site Plan:	Appendix A

2.3 Site Description Summary

A walkover inspection of the site was undertaken for the PSI on 16 June 2022. The inspection was limited to accessible areas of the site and immediate surrounds. An internal inspection of buildings was not undertaken.

At the time of the inspection, the site was occupied by a primary school. Several buildings were located onsite constructed of a variety of materials including concrete, brick, steel, glass and cement fibre. Around 17 of these buildings had cement fibre eaves which appeared in good or average condition. The site had secure fencing on all sides, and had no signs of erosion. No indicators were evident onsite at the time of the inspection.

Fill was evident from the exposed soil onsite with inclusions of igneous gravel and concrete fragments. A fibre cement fragment (FCF1) was found onsite in the southern section (see Figure 2). FCF1 has the potential to be asbestos containing material (ACM) and was sampled for testing as part of the DSI.

The drainage onsite is expected to flow towards the south with the topography into the Gaggin and Brabyn Street stormwater infrastructure. Sensitive environments such as wetlands, ponds, creeks or extensive areas of natural vegetation were not identified on site or in the immediate surrounds.

An assortment of trees and shrubs were located along the boundaries of the site which appeared in good condition. Grass was located throughout the site and appeared in poor condition with signs of stress and dieback.

During the site inspection, the following observations were made regarding the land uses in the immediate surrounds:

- North – Albert Street East with residential beyond;
- South – Residential;
- East – Gaggin Street with a playground and residential beyond; and
- West – Brabyn Street with residential beyond.

We did not observe any land uses in the immediate surrounds that were identified as potential contamination sources for the site.

2.4 Underground Services

The ‘Dial Before You Dig’ (DBYD) 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. DBYD will be reviewed for the DSI.

3 GEOLOGY AND HYDROGEOLOGY

3.1 Regional Geology

Regional geological information was reviewed for the PSI. The information was sourced from the Lotsearch report attached to the JKG PSI report. The report indicates that the site is underlain by Ashfield Shale of the Wianamatta Group, which typically consists of black to dark grey shale and laminite.

3.2 Acid Sulfate Soil (ASS) Risk and Planning

The site is not located in an ASS risk area according to the risk maps prepared by the Department of Land and Water Conservation.

ASS information presented in the Lotsearch report indicated 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.

3.3 Dryland Salinity

The site is located in an area mapped as having a moderately salinity potential in the Dryland Salinity Potential of Western Sydney map prepared by the NSW Office of Environment and Heritage. The moderate classification is attributed to scattered areas of scalding and indicator vegetation, in areas where concentrations have not been mapped. Saline areas may occur in this zone, which have not been identified or may occur if risk factors change adversely.

3.4 Hydrogeology

Hydrogeological information was reviewed for the PSI. The information was sourced from the Lotsearch report attached in the JKG PSI report. 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 55 registered bores within the report buffer of 2,000m. In summary:

- The nearest registered bore was located approximately 517m from the site. This was utilised for monitoring purposes;
- The majority of the bores were registered for monitoring purposes;
- There were no nearby bores (i.e. within 1,280m) registered for water supply uses; and
- The drillers log information from the closest registered bores typically identified fill and/or clay soil to depths of 0.4-8.0m, underlain by siltstone or sandstone bedrock. Standing water levels (SWLs) in the bores ranged from 2.68m below ground level (BGL) to 10.0mBGL.

The information reviewed for the PSI indicates that the subsurface conditions at the site are expected to consist of moderate to high permeability (alluvial) soils overlying shallow bedrock. The potential for viable groundwater abstraction and use of groundwater under these conditions is considered to be 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.

Considering the local topography and surrounding land features, we anticipate groundwater to flow towards the south west.

3.5 Receiving Water Bodies

Surface water bodies were not identified in the immediate vicinity of the site. The nearest down-gradient surface water body is Parramatta River which is located approximately 1,000m to the south of the site. The river, the ecological environment and recreational water users are considered to be potential receptors in relation to groundwater contamination migration from the site (although we consider the potential for direct migration of contamination from the site to the river to be unlikely given the river's distance from the site).

4 REVIEW OF 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. A review of the PSI CSM for the site is presented in the following table and is based on the site information (including the site inspection information) and the review of site history information undertaken for the PSI.

Table 4-1: Review of CSM

Contaminant source(s) and contaminants of concern	**Contamination sources:** historically imported fill soil; historical agricultural use, use of pesticides beneath buildings and around the site and hazardous building materials. **Contaminants of potential concern (CoPC) in soil include:** 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. The CoPC in groundwater include: Heavy metals; TRHs; BTEX; PAHs; and VOCs.
Affected media	Soil has been identified as the potentially affected medium. The potential for groundwater impacts is considered to be relatively low. However, groundwater would need to be considered in the event significant contamination was identified in soil.
Receptor identification	Human receptors include site users (including adults and children), construction workers and intrusive maintenance workers. Off-site human receptors include adjacent land users and recreational water users within Parramatta River. Ecological receptors include terrestrial organisms and plants within unpaved areas (including the proposed landscaped areas), and freshwater ecology in Parramatta River.
Exposure pathways and mechanisms	Potential exposure pathways relevant to the human receptors include ingestion, dermal absorption and inhalation of dust (all contaminants) and vapours (volatile TRH, naphthalene and BTEX). 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 is unlikely to occur in the Parramatta River through direct migration, however groundwater has the potential to enter the river via the stormwater system (which is expected to discharge into the river) 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; and • Migration of groundwater off-site and into nearby water bodies, including aquatic ecosystems and those being used for recreation.

5 SAMPLING, ANALYSIS AND QUALITY PLAN

5.1 Data Quality Objectives (DQO)

Data Quality Objectives (DQOs) were developed to define the type and quality of data required to achieve the project objectives outlined in Section 1.2. The DQOs were prepared with reference to the process outlined in Schedule B2 of NEPM (2013). The seven-step DQO approach for this project is outlined in the following sub-sections.

5.1.1 Step 1 - State the Problem

The PSI 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. A screening of soil for acid sulfate soil (ASS) and dryland salinity conditions is also required as part of the DSI.

The DQOs were developed by the author of this report and checked by the reviewer. Both the author and reviewer were joint decision-makers in relation to Step 2 of the DQO process.

5.1.2 Step 2 - Identify the Decisions of the Study

The objectives of the DSI investigation are outlined in Section 1.2. The decisions to be made reflect these objectives and are as follows:

- Did the site inspection 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 management of ASS and/or dryland salinity required for the proposed development?

5.1.3 Step 3 - Identify Information Inputs

The primary information inputs required to address the decisions outlined in Step 2 include the following:

- Existing relevant site history information from the PSI reports
- Site observations;
- Sampling of potentially affected media, including soil and groundwater;
- Observations of sub-surface variables such as soil type, photo-ionisation detector (PID) concentrations, odours and staining, and groundwater physiochemical parameters;
- Laboratory analysis of soils, fibre cement and groundwater for the CoPC identified in the CSM; and
- Field and laboratory QA/QC data.

5.1.4 Step 4 - Define the Study Boundary

The sampling will be confined to the site boundaries as shown in Figure 2 and will be limited vertically to nominated sampling depths of approximately 6mBGL (spatial boundary) or prior refusal of boreholes. The soil and groundwater sampling will be completed in July 2022 (temporal boundary).

5.1.5 Step 5 - Develop an Analytical Approach (or Decision Rule)

5.1.5.1 Tier 1 Screening Criteria

The laboratory data will be assessed against relevant Tier 1 screening criteria (referred to as SAC) in accordance with NEPM (2013), as outlined in the DSI.

5.1.5.2 Field and Laboratory QA/QC

Field QA/QC will include analysis of inter-laboratory duplicates (minimum of 5% of primary samples), intra-laboratory duplicates (minimum of 5% of primary samples), and trip spike (for volatiles), trip blank (for volatiles) and rinsate (for volatiles) samples (minimum of one for each medium sampled to assess the adequacy of field practices).

The suitability of the laboratory data is assessed against the laboratory QA/QC criteria which is outlined in the laboratory reports attached to the DSI. These criteria were 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.

5.1.5.3 Appropriateness of Practical Quantitation Limits (PQLs)

The PQLs of the analytical methods are 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.

5.1.6 Step 6 – Specify Limits on Decision Errors

To limit the potential for decision errors, a range of quality assurance processes are adopted. A quantitative assessment of the potential for false positives and false negatives in the analytical results is 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 has been adopted which is that, there is considered to be a

complete SPR linkage for the CoPC identified in the CSM unless this linkage can be proven not to (or unlikely to) exist. The null hypothesis has been adopted for this investigation.

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.

Statistical analysis will not apply to 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

Acceptable targets for trip blank samples will be less than the PQL for organic analytes. Metals will be considered on a case-by-case basis with regards to the reference material used as the blank medium.

Trip Spikes

Acceptable targets for trip spike samples will be 70% to 130%.

Laboratory QA/QC

The suitability of the laboratory data will be assessed against the laboratory QA/QC criteria. These criteria are developed and implemented in accordance with the laboratory's NATA accreditation and align with the acceptable limits for QA/QC samples as outlined in NEPM (2013) and other relevant guidelines.

A summary of the typical limits is provided below:

RPDs

- Results that are <5 times the PQL, any RPD is acceptable; and
- Results >5 times the PQL, RPDs between 0-50% are acceptable.

Laboratory Control Samples (LCS) and Matrix Spikes

- 70-130% recovery acceptable for metals and inorganics; and
- 60-140% recovery acceptable for organics.

Surrogate Spikes

- 60-140% recovery acceptable for general organics.

Method Blanks

- All results less than PQL.

In the event that acceptable limits are not met by the laboratory analysis, other lines of evidence will be reviewed (e.g. field observations of samples, preservation, handling etc) and, where required, consultation with the laboratory is to be undertaken in an effort to establish the cause of the non-conformance. Where uncertainty exists, we will adopt the most conservative concentration reported.

5.1.7 Step 7 - Optimise the Design for Obtaining Data

The most resource-effective design will be used in an optimum manner to achieve the investigation objectives. Adjustment of the investigation design can occur following consultation or feedback from project stakeholders. For this investigation, the design was 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 were collected.

The sampling plan and methodology are outlined in the following sub-sections.

5.2 Soil Sampling Plan and Methodology

The soil sampling plan and methodology to be adopted for the DIS investigation is outlined in the table below:

Table 5-1: Soil Sampling Plan and Methodology

Aspect	Input
Sampling Density	Soil samples for the DSI will be obtained from 28 sampling locations based on a grid based sampling plan. The approximate DSI sampling locations are shown on the attached Figure 2. The actual locations may vary based on site constraints such as buildings and services. The total number of locations meets the minimum sampling density as outlined in the NSW EPA Contaminated Sites Sampling Design Guidelines (1995)[4]. Sampling for ASS and dryland salinity conditions will also be obtained from selected sampling locations. Soil sampling for the DSI will be limited to approximately 0.5-1m into natural soils, and are anticipated to be limited to depths of approximately 1-3mBGL. Three selected boreholes will be

[4] NSW EPA, (1995), *Contaminated Sites Sampling Design Guidelines.* (referred to as EPA Sampling Design Guidelines 1995)

Aspect	Input
	extended to depths of approximately 6mBGL (or prior auger refusal) for the installation of groundwater monitoring wells.
Sampling Plan	The sampling locations will be placed on a systematic plan with a grid spacing of approximately 25m 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 are only applied were appropriate and in accordance with the DQOs). The actual locations may vary based on site constraints such as buildings and services and will be documented in the DSI.
Set-out and Sampling Equipment	Sampling locations will be set out using a tape measure or a hand-held GPS unit (with an accuracy of ±5m). 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 tools and drill rig equipped with spiral flight augers (150mm diameter) or push tube drill rig and 150mm diameter auger. Soil samples will be obtained from a Standard Penetration Test (SPT) split-spoon sampler, and/or directly from the auger or from disposable polyethylene push tube samplers and directly from the auger. Each borehole obtained via push tube samplers will be initially advanced using push tubes for standard contamination sampling, then subsequently using a 150mm diameter auger to facilitate the asbestos quantification sampling.
Sample Collection and Field QA/QC	All locations will be logged to an appropriate standard in accordance with NEPM (2013) and all samples will be documented on the logs. Samples will be placed in glass jars with plastic caps and Teflon seals with minimal headspace. Samples for asbestos analysis will be placed in zip-lock plastic bags. During sampling, soil at selected depths will be split into primary and duplicate samples for field QA/QC analysis. The field splitting procedure included alternately filling the sampling containers to obtain a representative split sample.
Field Screening	A portable Photoionisation Detector (PID) fitted with a 10.6mV lamp will be used to screen the samples for the presence of volatile organic compounds (VOCs). PID screening for VOCs will be undertaken on soil samples using the soil sample headspace method. VOC data will be obtained from partly filled zip-lock plastic bags following equilibration of the headspace gases. PID calibration records are maintained on file by JKG. The field screening for asbestos quantification from the boreholes will included the following: • A representative bulk sample (approximately 10L sample, to the extent achievable based on sample return) will be collected from fill at 1m intervals, or from each distinct fill profile. The quantity of material may vary based on whatever return can be achieved using the auger. The bulk sample intervals will be shown on the borehole logs attached to the DSI; • Each sample will be weighed using an electronic scale; • Each bulk sample will be either passed through a sieve with a 7.1mm aperture and inspected for the presence of fibre cement or due to the cohesive nature of the soils, the sample will be 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

Aspect	Input
	• 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) and summarised in the DSI report.
Decontami-nation 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 Decon90) will not be used during the decontamination process for borehole locations converted to monitoring wells as they may result in interference during PFAS analysis. Soil samples will be preserved by immediate storage in an insulated sample container with ice. On completion of the fieldwork, the samples may be temporarily stored in a fridge at the JKG office, before being delivered in the insulated sample container to a NATA registered laboratory for analysis under standard COC procedures.

5.3 Groundwater Sampling Plan and Methodology

The groundwater sampling plan and methodology is outlined in the table below:

Table 5-2: Groundwater Sampling Plan and Methodology

Aspect	Input
Sampling Plan	Groundwater monitoring wells will be installed in selected boreholes positioned to establish baseline groundwater conditions at the site. This will include an up-gradient area of the site and would be expected to provide an indication of groundwater flowing onto (beneath) the site from the north and intermediate to down-gradient area of the site and would be expected to provide an indication of groundwater flowing across (beneath) the site and beyond the down-gradient site boundary. The final locations will be subject to site assess limitation associated with existing site buildings and/or services, other site constraints.
Monitoring Well Installation Procedure	The monitoring well construction details will be documented on the corresponding borehole log. The wells are to be installed to approximately 6mBGL and generally constructed as follows: • 50mm diameter Class 18 PVC (machine slotted screen) installed in the lower section of the well to intersect groundwater; • 50mm diameter Class 18 PVC casing installed in the upper 1m of the well (screw fixed); • A 2mm sand filter pack around the screen section for groundwater infiltration; • A hydrated bentonite seal/plug 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 well construction is considered to be appropriate for screening purposes to assess general aquifer conditions with regards to the recommended monitoring well installation requirements 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. The monitoring wells will be developed until steady state conditions are achieved or the well is effectively dry. 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 was less than 10%, and when the SWL was not in drawdown.

Aspect	Input
	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 five to seven days after development prior to sampling. Prior to sampling, the monitoring wells will be checked for the presence of Light Non-Aqueous Phase Liquids (LNAPLs) 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/disposable plastic bailer. During sampling, 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 was less than 10%, and when the SWL was not in drawdown. Groundwater samples will be obtained directly from the single use PVC tubing and placed in the sample containers. Duplicate samples will 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 JKG 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	During development, the pump and hose will be flushed between monitoring wells with a potable water and Decon solution, followed by a pulse of potable water. The pump tubing will be discarded after each sampling event and replaced with new tubing when necessary. 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 JKG office, before being delivered in the insulated sample container to a NATA registered laboratory for analysis under standard COC procedures.

5.4 Laboratory Analysis

Selected soil and groundwater samples obtained during the investigation will be sent to National Association of Testing Authorities, Australia (NATA) accredited laboratories for analysis in accordance with the NEPM 2013. The analytical schedule for the DSI will include the following:

- Up to 28 selected soil samples will be analysed for: heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc); polycyclic aromatic hydrocarbons (PAHs); total recoverable hydrocarbons (TRH); monocyclic aromatic hydrocarbons (BTEX); organochlorine (OC) and organophosphate (OP) pesticides; polychlorinated biphenyls (PCBs); and asbestos (500mL);
- Up to 10 selected deeper soil samples will be analysed for: heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc); PAHs; TRH; BTEX;
- Up to six selected soil samples will be analysed for Per- and Polyfluoroalkyl Substances (PFAS);

- Up to four selected fill/natural soil samples will be analysed for: pH; cation exchange capacity (CEC); and clay content (%);
- Up to four selected fibre cement fragments (FCF), if found on or in soil, will be analysed for asbestos;
- Up to 24 selected soil samples will be analysed for ASS using the pH field test method (pH_F and pH_{FOX});
- Up to 16 selected soil samples will be analysed for pH, electrical conductivity (EC), resistivity (calculated from EC results), sulphate and chloride;
- Up to four selected soil samples will be analysed for soil texture;
- A nominal allowance for TCLP leachability analysis for PAHs, PFAS and selected metals has been included to provide a preliminary waste classification for the off-site disposal of soil in accordance with NSW EPA Waste Classification Guidelines - Part 1: Classifying Waste (2014);
- Up to three groundwater samples will be analysed for the following: heavy metals; TRH/BTEX; low level PAHs; Volatile Organic Compounds (VOCs); PFAS; pH; EC; sulphate and chloride; and
- Collection and analysis of QA/QC samples (including intra- and inter-laboratory duplicates, trip blank/spike and rinsate blanks).

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.

5.5 Reporting Requirements

A DSI report will be prepared presenting the results of the investigation, in accordance with the NSW EPA Consultants Reporting on Contaminated Land, Contaminated Land Guidelines (2020)[5], NEPM 2013 and other guidelines made under the Contaminated Land Management Act 1997.

[5] NSW EPA, (2020). *Consultants Reporting on Contaminated Land, Contaminated Land Guidelines*

6 LIMITATIONS

The report limitations are outlined below:

- JKG 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 JKG proposal; and terms of contract between JKG 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, JKG has not undertaken any verification process, except where specifically stated in the report;
- JKG 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;
- JKG 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;
- JKG 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. JKG 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.

Appendix A: Report Figures

APPENDIX J



AERIAL IMAGE SOURCE: MAPS.AU.NEARMAP.COM

This plan should be read in conjunction with the report.

Title: **SITE LOCATION PLAN**

Location: PARRAMATTA EAST PUBLIC SCHOOL, PARRAMATTA, NSW

Report No: E35073B

Figure No: 1

JKGeotechnics

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APPENDIX J



LEGEND

APPROXIMATE SITE BOUNDARY	
FCF(Surface)	FIBRE CEMENT FRAGMENT LOCATION, NUMBER AND DEPTH (Surface/m)
	PROPOSED JKG BOREHOLE
	PROPOSED JKE BOREHOLE

AERIAL IMAGE SOURCE: MAPS.AU.NEARMAP.COM

0 10 20 30 40 50

SCALE 1:1000 @A3 METRES

This plan should be read in conjunction with the report.

Title: **PROPOSED SAMPLE LOCATION PLAN**

Location: PARRAMATTA EAST PUBLIC SCHOOL, PARRAMATTA, NSW

Report No: E35073B

Figure No: 2

JKGeotechnics

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Appendix B: Report Explanatory Notes

QA/QC Definitions

The QA/QC terms used in this report are defined below. The definitions are in accordance with US EPA publication SW-846, entitled *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (1994)[6] methods and those described in *Environmental Sampling and Analysis, A Practical Guide,* (1991)[7]. 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;

[6] US EPA, (1994). *SW-846: Test Methods for Evaluating Solid Waste, Physical/Chemical Methods.* (US EPA SW-846)

[7] Keith., H, (1991). *Environmental Sampling and Analysis, A Practical Guide*

- All laboratory duplicate and RPDs calculated;
- All surrogate spike data reported;
- All matrix spike and lab control spike (LCS) data reported and RPDs calculated;
- Spike recovery acceptable limits reported; and
- NATA stamp on reports.

F. Comparability

Comparability is the evaluation of the similarity of conditions (e.g. sample depth, sample homogeneity) under which separate sets of data are produced. Data comparability checks include a bias assessment that may arise from the following sources:

- Collection and analysis of samples by different personnel; Use of different techniques;
- Collection and analysis by the same personnel using the same methods but at different times; and
- Spatial and temporal changes (due to environmental dynamics).

G. Blanks

The purpose of laboratory and field blanks is to check for artefacts and interferences that may arise during sampling, transport and analysis.

H. Matrix Spikes

Samples are spiked with laboratory grade standards to detect interactive effects between the sample matrix and the analytes being measured. Matrix Spikes are reported as a percent recovery and are prepared for 1 in every 20 samples. Sample batches that contain less than 20 samples may be reported with a Matrix Spike from another batch. The percent recovery is calculated using the formula below. Acceptable recovery limits are 70% to 130%.

$$\frac{\text{(Spike Sample Result – Sample Result) x 100}}{\text{Concentration of Spike Added}}$$

I. Surrogate Spikes

Samples are spiked with a known concentration of compounds that are chemically related to the analyte being investigated but unlikely to be detected in the environment. The purpose of the Surrogate Spikes is to check the accuracy of the analytical technique. Surrogate Spikes are reported as percent recovery.

J. Duplicates

Laboratory duplicates measure precision, expressed as Relative Percent Difference. Duplicates are prepared from a single field sample and analysed as two separate extraction procedures in the laboratory. The RPD is calculated using the formula where D1 is the sample concentration and D2 is the duplicate sample concentration:

$$\frac{(D1 - D2) \times 100}{\{(D1 + D2)/2\}}$$

Appendix C: Guidelines and Reference Documents

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, (1995). Contaminated Sites Sampling Design Guidelines

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

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