Sydney Environmental Group

Detailed Site Investigation

43, 45, & 49 Warriewood Road, Warriewood NSW

Warriewood Developers (c/- Macpherson Kelley)

Report No: 2148-DSI-01-280723.v1f
Report Date: 28 July 2023

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DOCUMENT RECORD

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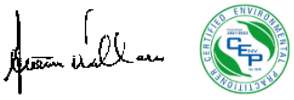
Author Signature		**Reviewer Signature**	
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Document Title:	Stage 2 Detailed Site Investigation, 43, 45 & 49 Warriewood Road, Warriewood NSW
Site Address:	43, 45 & 49 Warriewood Road, Warriewood NSW
Client Name:	Warriewood Developers Pty Ltd (c/- Macpherson Kelley Pty Ltd)
Site Size: **Area of Investigation**	≈ 2.21 ha ≈ 1.3 ha
Reference Number:	2148-DSI-01-280723.v1f
Project Type:	Detailed Site Investigation
Project Type Abbreviation:	DSI
Document Draft:	FINAL
Document Revision No.	v1

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EXECUTIVE SUMMARY

Sydney Environmental Group (SE) was engaged by Warriewood Developers Pty Ltd (c/- Macpherson Kelley Pty Ltd) (the client), to undertake a Detailed Site Investigation of the site located at 43, 45 & 49 Warriewood Road, Warriewood NSW (refer Figure 1 with the 'site' boundaries outlined in Figure 2).

SE has the following project appreciation:

- The entirety of the site covers an area of approximately 2.21 ha;
- The targeted intrusive assessment was undertaken within a 1.3 ha portion of the site;
- The site is proposed for demolition of existing structures and construction of two residential flat buildings and the associated residential subdivision of land;
- A Stage 1 Preliminary Site Investigation was undertaken for the site by NG Child & Associates in November 2021 (NG 2021);
- An updated Stage 1 Preliminary Site Assessment undertaken for the site by Sydney Environmental Group in July 2023 (SE 2023);
- A Detailed Site Investigation is required to characterise potential areas of environmental concern (PAECs) identified by SE (2023), identify any contamination that may be present, and provide advice on the suitability of the site for the proposed future land-use.

The objectives of this project were to:

- Assess the potential for contamination to be present on the site as a result of past and current land use activities;
- Target Potential Areas of Environmental Concern identified in previous contamination assessments undertaken;
- Provide advice on whether the site would be suitable (in the context of land contamination) for the proposed future land use setting; and
- Provide recommendations for further investigation, management and/or remediation (if warranted).

SE undertook the following scope of works to achieve the project objective:

- Review of the previous contamination assessment prepared for the site;
- The preparation of a Sampling and Analysis Quality Plan (SAQP);
- Laboratory analysis of selected samples collected during the field investigation; and
- An assessment of the contamination status of the fill materials within the site and the recommendation of any further remedial requirements associated with the redevelopment of the site (if necessary).

Based on SE's assessment of the desktop review information, fieldwork data and laboratory analytical data, in the context of the proposed redevelopment scenario, SE makes the following conclusions:

- Non-friable Asbestos Containing Materials (ACM) were identified within surficial soils (AEC02 and AEC03);
- The detected concentrations of the remaining identified contaminants of potential concern in the soils assessed are considered unlikely to present:
    - An unacceptable direct contact human health exposure risk; or
    - An unacceptable inhalation risk, with the exception of localised asbestos impacts (AEC02 and AEC03) discussed above; and
    - A petroleum hydrocarbon management risk;
- The detected concentrations of identified contaminants of potential concern in the soils characterised by samples assessed are considered unlikely to present an unacceptable ecological contamination risk;
- Underlying soil materials within AEC01 could not be assessed due to the presence of existing structures;

- Based on the assessments undertaken as part of this investigation, SE has concluded that the site is generally suitable for the proposed redevelopment subject to remediation of minor localised non-friable asbestos impacts (AEC02 and AEC03), and further characterisation of soils underlying existing on-site structures.

Based on the conclusions stated above and the background data gathered during the course of this investigation, SE recommends:

- Preparation of a Remedial Action Plan to outline the methodology to remediate minor localised shallow non-friable asbestos impacts and to further characterise previously inaccessible soils situated beneath the existing building footprints following demolition;
- Undertake a hazardous building materials survey of the structures present on-site prior to demolition;
- Following removal of hazardous building materials (if identified) and subsequent demolition of the onsite structures, a clearance inspection should be carried out by an appropriately qualified occupational hygienist / NSW LAA;
- A supplementary contamination assessment is to be undertaken beneath the building footprints following demolition by an appropriately experienced environmental scientist; and
- A waste classification assessment must be carried out on any soil materials proposed for disposal off-site as per the NSW EPA Waste Classification Guidelines (2014).

This report, including its conclusions and recommendations, must be read in conjunction with the limitations presented in **Section 15.**

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ABBREVIATIONS

AHD	Australian Height Datum
ANZECC	Australian and New Zealand Environment and Conservation Council
AST	Aboveground storage tank
Bgs	Below ground surface
BTEX	Benzene, Toluene, Ethylbenzene, Xylene
Btoc	Below top of casing
CoC	Chain of Custody
CSM	Conceptual Site Model
DSI	Detailed Site Investigation
EC	Electrical conductivity
EIL	Ecological Investigation Level
ESL	Ecological Screening Level
EPA	Environment Protection Authority
GS	Geological Survey of NSW
HIL	Health Investigation Levels
HSL	Health Screening Levels
IL	Investigation Levels
LOR	[Laboratory] Limit of reporting
NATA	National Association of Testing Laboratories
N/A	Not applicable
ND	Not detected
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
NSW EPA	NSW Environment Protection Authority
OCP	Organochlorine Pesticide
OPP	Organophosphorus Pesticide
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PID	Photo-ionisation detector
PSH	Phase separated hydrocarbon
PSI	Preliminary Site Investigation
QA/QC	Quality assurance/Quality control
RPD	Relative percentage difference
SAQP	Sampling Analysis and Quality Plan
SE	Sydney Environmental Group Pty Ltd
SVOC	Semi-volatile organic compound
TPH	Total petroleum hydrocarbon
USCS	Unified Soil Classification System
UST	Underground storage tank
VOC	Volatile organic compound

1. INTRODUCTION

1.1. Background

Sydney Environmental Group (SE) was engaged by Warriewood Developers Pty Ltd (c/- Macpherson Kelley Pty Ltd) (the client), to undertake a Detailed Site Investigation of the site located at 43, 45 & 49 Warriewood Road, Warriewood NSW (refer Figure 1 with the 'site' boundaries outlined in Figure 2).

SE has the following project appreciation:

- The entirety of the site covers an area of approximately 2.21 ha;
- The targeted intrusive assessment was undertaken within a 1.3 ha portion of the site;
- The site is proposed for demolition of existing structures and construction of two residential flat buildings and the associated residential subdivision of land;
- A Stage 1 Preliminary Site Investigation was undertaken for the site by NG Child & Associates in November 2021 (NG 2021);
- An updated Stage 1 Preliminary Site Assessment undertaken for the site by Sydney Environmental Group in July 2023 (SE 2023);
- A Detailed Site Investigation is required to characterise potential areas of environmental concern (PAECs) identified by SE (2023), identify any contamination that may be present, and provide advice on the suitability of the site for the proposed future land-use.

1.2. Proposed Development

The site is proposed for redevelopment comprising demolition of existing structures and construction of two residential flat buildings containing 34 apartments with basement parking and associated services, and the associated residential subdivision of land.

As the proposed future site use is proposed to include lots with accessible soil, SE considers it reasonable to adopt the 'HIL A' per NEPM ASC 2013, in order to conservatively assess the site for any future proposed land use as well as the current land use.

Currently under the *State Environmental Planning Policy (SEPP) (Resilience and Hazards)* - a consent authority must not consent to the carrying out of any redevelopment unless it has considered whether the land is contaminated. This report has been prepared to satisfy Clause 6 and 7 of SEPP and Council planning policies.

1.3. Objectives

The objectives of this project were to:

- Assess the potential for contamination to be present within the cleared portion of the site as a result of past and current land use activities;
- Provide advice on whether the site would be suitable (in the context of land contamination) for the proposed land use setting; and
- Provide recommendations for further investigation, management and/or remediation (if warranted).

1.4. Scope of Work

SE undertook the following scope of works to achieve the project objective:

- Review of the previous contamination assessment prepared for the site;
- The preparation of a Sampling and Analysis Quality Plan (SAQP);
- Laboratory analysis of selected samples collected during the field investigation; and
- An assessment of the contamination status of the fill materials within the site and the recommendation of any further remedial requirements associated with the redevelopment of the site (if necessary).

2. SITE IDENTIFICATION

The site identification details and associated information are presented in **Table 2.1.**

Table 2.1. Site Identification Information

Attribute	Description
Street Address	43, 45, and 49 Warriewood Road, Warriewood NSW
Lot and Deposited Plan (DP)	Lots 1 & 2 DP349085 and Lot 2 DP972209
Geographical Coordinates	33°41'13.36"S 151°17'52.71"E (Centre of site)
Site Area **Area of Investigation**	≈ 2.21 ha ≈ 1.3 ha
Local Government Area (LGA)	Northern Beaches Council
Parish	Narrabeen
County	Cumberland
Zoning	R3 – Medium Density Residential *(Pittwater Local Environmental Plan 2014)*

The locality of the site is set out in **Figure 1**.

The general layout and boundary of the site is set out in **Figure 2**.

A copy of a detail and level survey is presented in **Appendix A**.

3. GEOLOGY, ACID SULFATE SOILS, TOPOGRAPHY AND HYDROGEOLOGY

Regional geology, topography, soil landscape and hydrogeological information are presented in **Table 3.1.**

Table 3.1. Regional Setting Information

Attribute	Description
Climate	A review of the closest weather station to the site (Norah Head AWS, Station Number: 061366) indicated that the climate is relatively mild with average maximum temperatures ranging from 17.5 – 26.3 °C and minimum temperatures ranging from 9.9 – 20.0 °C. Rainfall is relatively varied across the year, ranging from 5.9 days of rain per month in August, to 10.0 average days of rainfall per month in March. Average monthly rainfall varied from 63.4 mm in September up to 145.7 mm in June.
Geology	A review of the Environment NSW 'eSpade V2.2' web application (environment.nsw.gov.au/eSpade2WebApp, accessed 4 July 2023), indicated that the western portion of the site is likely to be underlain by Terrigal Formation of the Narrabeen Group, comprising lithic and quartz sandstone and siltstone, minor sedimentary breccia, claystone and conglomerate. The eastern portion of the site is likely to be underlain by Narrabeen Group sediments, comprising interbedded laminate and shale with quartz to lithic quartz sandstone.
Acid Sulfate Soils (ASS)	A review of the Environment NSW 'eSpade V2.2' web application (environment.nsw.gov.au/eSpade2WebApp, accessed 4 July 2023), indicates that the site lies in an area mapped as ***'No Known Occurrence'*** with respect to acid sulfate soils. This infers that land management activities are not likely to be affected by acid sulfate soil materials. Further assessment of acid sulfate soils in the context of this investigation is considered by SE as not warranted.
Topography	Generally, the local landscape consists of rolling to steep hills on fine-grained Narrabeen Group sediments, with local relief 60 – 120 m and slopes >25%. The site topography slopes downward towards the south-west of site. SE understands that the site is located at an elevation approximately 6 m to 17 m Australian Height Datum (AHD).
Hydrology and Hydrogeology	Surface water courses proximal to the site include Narrabeen Creek, located immediately south-west of the site, Fern Creek, located 455 m west of the site and the South Pacific Ocean, located approximately 950 m east of the site. Based on distances to the nearest surface water course and the site topography, groundwater flow in the vicinity of the site is considered likely to be towards the west toward Narrabeen Creek. A review of the NSW Office of Water groundwater database undertaken on 4 July 2023 indicated there were four (4) registered groundwater features located within a 500m radius of the site: • GW106698 – monitoring bore, Standing Water Level (SWL) not specified, located approximately 110 m north-west of the site; • GW106697 – monitoring bore, SWL not specified, located approximately 75 m south-west of the site; • GW106699 – monitoring bore, SWL not specified, located approximately 200 m south-west of the site; and GW108034 – test bore, SWL not specified, located approximately 250 m north-west of the site.
Adjacent Sensitive Receptors	A review of the Bureau of Meteorology Groundwater Dependent Ecosystem Map was undertaken to determine the closest sensitive ecological receptors. The closest ecological receptor is the South Pacific Ocean, located approximately 950 m east of the site identified to contain a low dependent ecosystem. South Creek, located approximately 1.65 km south of the site identified to contain a highly dependent ecosystem. The closest sensitive human receptors are the residential properties surrounding the site's boundary and any future onsite construction workers/ builders.

4. PREVIOUS ASSESSMENTS

The following reports were reviewed during the project:

- NG Child & Associates (2021), 'Preliminary (Stage 1) Site Investigation, Proposed Residential Sub-Division, 45/49 Warriewood Road, Warriewood NSW', dated 16 November 2021, report ref: CA/20/126-2701.

- Sydney Environmental Group (SE 2023), 'Stage 1 Preliminary Site Investigation, 43, 45 & 49 Warriewood Road, Warriewood NSW', dated 7 July 2023, Ref: 2148-PSI-01-060723.v1f

A summary of the previous assessment is provided below.

4.1. NG (2021)

Creative Planning Solutions, on behalf of its client Mikara Developments Pty Ltd, was coordinating the planning and prospective delivery of a residential sub-division at 45/49 Warriewood Road, Warriewood NSW. The proposed development is subject to the regulatory control of the Northern Beaches Council, and relevant NSW Government departments and agencies. Northern Beaches Council were the consent authority for the proposed development. NG Child & Associates has undertaken a Stage 1 or Preliminary Site Investigation in relation to the proposed development. The findings are summarised below.

Preliminary Site Investigation

The site investigation and assessment were completed in accordance with all relevant guidelines and protocols, including those provided by in the NSW EPA document Guidelines for Consultants Reporting on Contaminated Sites (1997, reprinted 2000 & 2011), and included in particular:

- A detailed review and consideration of the history and past uses of the site, based on a search of available title and ownership records;
- A thorough physical inspection of the site and surrounding properties; and
- Sampling, physical examination and laboratory analysis of soil samples at varying depths from five soil bores drilled by mechanized hand augur at representative locations throughout the site area.

Site History

The site had in the past been used for market gardening, and a preliminary review of the physical appearance of representative soil samples from the site, together with appropriate supporting laboratory analysis, had been undertaken to ensure that chemical contamination form this past use of the land has not affected soil quality at the site, when assessed against the residential soil quality criteria relevant to the proposed development.

Site Inspection

Based on the site inspections undertaken the general environmental condition of the 45/49 Warriewood Road Warriewood site was considered to be sound, and a detailed physical inspection of the site had not indicated any significant environmental or contamination issues prejudicial to the residential land use proposed for the site. However, it is noted that materials containing asbestos are likely to be present within the existing buildings and structures at the site; and that it is possible that minor quantities of other potentially hazardous or dangerous materials may be identified during any future demolition or construction works at the site.

Soil Sampling & Analysis

Twenty-three (23) soil samples were collected from various depths at five soil bores installed by mechanized hand augur at representative locations throughout the site. These samples were carefully examined on-site for any indications of contamination. Fifteen of these samples, including one duplicate sample and three asbestos analysis samples, were forwarded to a NATA registered laboratory (Envirolab Services Pty Ltd) for detailed chemical analysis targeting a wide range of potential contaminants potentially relevant to land subject to prior market gardening use. The key findings of this assessment of soil quality are as follows.

- None of the 23 soil samples collected from and examined at the site provided any physical indication during the drilling and sampling process of contamination, either by discoloration, staining, odour or hydrocarbon residue response to examination by a photo-ionisation detector;
- No indication of any significant presence of contaminated fill was noted at the site;
- None of the 15 representative soil samples from the site sent to the NATA accredited laboratory of Envirolab Services for analysis indicated the presence of heavy metals, petroleum hydrocarbons, phenolic compounds and polyaromatic hydrocarbon species at levels of potential concern, or at levels in excess of relevant residential land use guidelines;
- Asbestos was not detected in any of the representative surface and near surface soil samples from the site;
- On this basis, the soils at the site are assessed as being free of contamination, and soil quality at the site is considered appropriate for the residential land use proposed; and
- The absence of volatile contaminants in the sub surface at the site indicates that vapour intrusion from sub surface soil strata through and into any future slab floor or basement areas that might be considered at the site will not present an environmental, indoor air quality or other contamination problem.

Overall Findings & Recommendations

The overall findings of this Preliminary or Stage 1 Site Investigation had established that the underlying soils at the site were free of contamination; that the site was suitable in general environmental and soil quality terms for the residential use proposed; and that no further or more detailed assessment was considered necessary to establish this finding. These findings are made subject to the following recommendations:

1. That appropriate handling and disposal practices, in accordance with relevant hazardous material handling and disposal guidelines, are observed in relation to any asbestos based materials encountered during future demolition and clearance works undertaken at the site;
2. That a Destructive Hazardous Material Survey per Australian Standard AS2601:2001 The Demolition of Structures and a supporting Demolition Management Plan should be prepared and implemented prior to the commencement of demolition and/or site clearance works;
3. That appropriate care is taken in respect of any other potentially hazardous or dangerous materials unexpectedly identified during any future demolition or clearance works involving the three existing dwellings at the site; and
4. That an appropriate “Unexpected Finds Protocol” is established and implemented during future site preparation and development works.

The original version of this report was completed in February 2020. The updated version included the final plans and drawings for the proposed development. The overall findings and recommendations of the February 2020 report have been reviewed and remain valid and applicable at the date of this revised report.

4.2. SE (2023)

Sydney Environmental Group Pty Ltd (SE) was engaged by Warriewood Developers Pty Ltd (c/- Macpherson Kelley Pty Ltd) (hereafter referred to as ‘the client’), to undertake a Stage 1 Preliminary Site Investigation of the property located at 43, 45, and 49 Warriewood Road, Warriewood NSW (hereafter referred to as ‘the site’)

The primary objective of the investigation was to provide a qualitative assessment of the environmental condition of the site, by appraising the potential for site contamination on the basis of field observations, historical land uses and anecdotal and documentary evidence supplemented by targeted soil sampling.

The key findings of the PSI were as follows:

- The site comprises a triple allotment (Lot 1 and 2 in Deposited Plan 349085, and Lot 2 in Deposit Plan 972209), covering a total area of approximately 2.21 hectares;

- Based on the available historical information, the site had been used for market gardens and greenhouses, and residential and associated structures which were constructed in the 1950's. Several of these structures have been demolished over the years, including all of the greenhouses;
- The site and neighbouring properties were free of statutory notices and licensing agreements issued under the *Contaminated Land Management Act 1997* and *Protection of the Environment Operations Act 1997*. The site was not included on the *List of NSW Contaminated Sites Notified to the EPA*;
- There were four (4) registered bores within a 500 m radius of the site, three (3) of which were in use as monitoring bores and one (1) in use as a test bore;
- During the site walkover, SE observed all existing structures to be in various states of disrepair. Several of which were noted to be Potentially Asbestos Containing Materials (PACM).
- Fill materials were observed in large stockpiles, on the western and eastern boundaries of the site.
- Surficial PACM was observed within localised locations across the soil surface in close proximity to the on-site structures. SE attributes the PACM to likely weathered building materials and structure disrepair.
- Six (6) areas of potential environmental concern (PAECs) were identified for the site.

Based on the findings of the PSI and with due consideration of SE's Statement of Limitations, it was concluded there was potential for contamination to exist on the site which requires further intrusive investigation, to address identified data gaps.

4 DATA INTEGRITY ASSESSMENT

SE has relied on the following sources of data while undertaking this investigation:

- SE field observations during the site walkover;
- Council Resources;
- Department of Land and Water Conservations;
- Department of Minerals and Energy;
- Department of Primary Industries – Water;
- Australian Soil Resource Information System;
- Google Earth;
- National Environment Protection Council;
- Nearmap;
- NSW Environment Protection Authority; and
- NSW Land and Property Information.

Based on SE's experience and professional judgement, the data obtained from the sources relied upon, is considered to be adequately precise, accurate, representative, complete and comparable within the objectives of this investigation and for the purpose of drawing conclusions regarding land contamination risks at the site.

5. CONCEPTUAL SITE MODEL DEVELOPMENT

5.1. Potential Areas of Environmental Concern and Contaminants of Potential Concern

The review of site history, previous contamination assessments and site walkover observations were assessed within the objectives of this investigation and in the context of the proposed development works. That assessment identified Potential Areas of Environmental Concern (PAEC) and Contaminants of Potential Concern (COPC) which have the potential to be present on site. The PAEC and associated COPC identified are presented in **Table 5.1.1**.

Table 5.1.1 PAEC and COPC

ID	Potential Area of Environmental Concern	Land Use Activity	Contaminants of Potential Concern
PAEC01	Fill Materials Across Former Market Gardens	Uncontrolled Filling, Pesticide Usage	Heavy metals, TRH, BTEX, PAH, OCP, OPP, PCB & Asbestos
PAEC02	On-site Structures	Hazardous Building Materials	Asbestos, Lead, SMF & PCB
PAEC03	Localised suspected ACM Impacts	Weathered Building Materials	Aesthetics & Asbestos
PAEC04	Fill material stockpiles along eastern and western boundaries of site	Uncontrolled Filling, Pesticide Usage	Heavy metals, TRH, BTEX, PAH, OCP, OPP, PCB & Asbestos
PAEC05	Former Chemical/Pesticide Storage within Sheds	Chemical/Pesticide Storage	Heavy metals, TRH, BTEX, PAH, OCP, OPP, PCB
PAEC06	Former Structure within 45 Warriewood Road	Uncontrolled Demolition	Heavy metals, TRH, BTEX, PAH, PCB & Asbestos

The potential contamination pathways are considered to be as follows:

- Inhalation/ingestion of contaminants released in dust during redevelopment; and
- Direct contact, ingestion or inhalation of soil.

Relevant potential receptors are considered to include:

- Onsite construction and maintenance workers;
- Third parties during construction (adjacent site users and adjacent residents);
- Onsite flora and fauna;
- Future residents/end users; and
- Neighbouring residential land users.

5.2. Land Use Setting

SE understands that the site is proposed for demolition of existing structures and construction of two residential flat buildings and the associated residential subdivision of land

As the proposed future site use is proposed to include lots with accessible soils, SE considers it reasonable to adopt the 'HIL A' per guidance provided in Section 2.2 of Schedule B (1) of the National Environment Protection Measure (Assessment of Site Contamination) 2013 (NEPM ASC 2013), in order to conservatively assess the site for any future proposed land use as well as the current land use.

5.3. Drinking Water Use

There are no groundwater bores onsite or down-gradient of the site, registered for drinking water use. It is noted that a reticulated mains potable water supply is available in the area. Therefore, further assessment of this groundwater drinking water value is considered not warranted.

5.4. Recreational Water Use

Surface water courses proximal to the site included Narrabeen Creek, located immediately south-west of the site, Fern Creek, located 455 m west of the site and the South Pacific Ocean, located approximately 950 m east of the site.

There is a potential, albeit low, that the usage of these surface water courses within proximity to the site would include swimming, fishing for consumption and / or water sports, and as such consideration of this pathway is considered warranted.

5.5. Aquatic Ecosystems

Surface water courses proximal to the site included Narrabeen Creek, located immediately south-west of the site, Fern Creek, located 455 m west of the site and the South Pacific Ocean, located approximately 950 m east of the site.

Based on historical and ongoing land-use there is a potential, for surface / groundwater contamination. As a conservative measure, consideration of this value is deemed warranted.

5.6. Direct Contact – Human Health

SE notes that the proposed development includes building footprints and hardstand pavement areas across some of the site, which would act as a direct contact barrier between potential land contamination and onsite receptors during operation of the site. However, it is understood that majority of the site will remain as open space / landscaping areas. The open space turfed / landscaping areas would act as a direct contact barrier assuming intrusive disturbance of the physical barrier was not undertaken following installation.

During construction, the public and construction employees, may complete the direct contact exposure pathway between potential contamination and receptors. As such, further consideration of this value is considered warranted.

5.7. Inhalation / Vapour Intrusion – Human Health

In order for a potentially unacceptable inhalation / vapour intrusion human health exposure risk to exist, a primary vapour source (e.g. underground storage tank) or secondary vapour source (e.g. significantly contaminated soil or groundwater) must be present onsite. The historical evidence review by SE indicated a very low likelihood for a potential primary source to be present on the site.

Based on the site walkover and the potential for asbestos containing materials (ACM) to be present within the site footprint, SE consider the need for further inhalation human health risk assessment to be warranted.

5.8. Aesthetics

Section 3.6.3 of NEPM ASC 2013 advises that there are no specific numeric aesthetic guidelines, however site assessment requires a balanced consideration of the quantity, type and distribution of foreign material or odours in relation to the specific land use and its sensitivity.

SE notes that the proposed development includes building footprints and hardstand pavement areas across some of the site, which would act as a direct contact barrier. The open space turfed areas would act as a direct contact barrier assuming intrusive disturbance of the physical barrier was not undertaken following installation.

Based on observations made within SE 2023, further consideration of this value is warranted.

5.9. Ecological Health - Terrestrial Ecosystems

Section 3.4.2 of Schedule B1 NEPM ASC 2013, advises a pragmatic risk-based approach should be taken in applying ecological investigation levels and ecological screening levels in residential and commercial / industrial land use settings.

SE notes that the proposed development would include landscaped areas on site as it is understood majority of the site will remain undeveloped.

Due to the presence of these areas and the distance to surface water courses proximal to the site, consideration to onsite and adjacent ecological receptors should be undertaken.

5.10. Management Limits for Petroleum Hydrocarbon Compounds

NEPM ASC 2013 notes that there are a number of policy considerations which reflect the nature and properties of petroleum hydrocarbons:

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

Schedule B1 of NEPM ASC 2013 includes 'management limits' to avoid or minimise these potential effects. Application of the management limits requires consideration of site-specific factors such as the depth of building basements and services and depth to groundwater, to determine the maximum depth to which the limits should apply. NEPM ASC 2013 also notes that management limits may have less relevance at operating industrial sites which have no or limited sensitive receptors in the area of potential impact, and when management limits are exceeded, further site-specific assessment and management may enable any identified risk to be addressed.

6. SITE ASSESSMENT CRITERIA

Taking into consideration the objectives of this project, and the conceptual site model and land use setting presented in **Section 5** of this project, the following assessment criteria have been adopted for this project:

- Human health direct contact – HILs in Table 1A (1) in NEPM ASC 2013 and HSLs in Table B4 of Friebel, E & Nadebaum, P (2011);
- Human health inhalation/vapour intrusion – HSLs in Table 1 (A) in NEPM ASC 2013;
- Human health (asbestos) – absence / presence for preliminary screening, and no visible ACM on surface;
- Petroleum hydrocarbon compounds (management limits) – Table 1 B (7) of NEPM ASC 2013;
- Ecological Investigation and Screening Levels as calculated per NEPM ASC 2013 Table 1 (B) 1-6; and
- Aesthetics – no highly malodorous site media (e.g. strong residual petroleum hydrocarbon odours, hydrogen sulphide in site media, organosulfur compounds), no hydrocarbon sheen on surface water, no discoloured chemical deposits or soil staining with chemical waste other than of a very minor nature, no large monolithic deposits of otherwise low risk material (e.g. gypsum as powder or plasterboard, cement kiln dust), no presence of putrescible refuse including material that may generate hazardous levels of methane such as a deep-fill profile of green waste or large quantities of timber waste, and no soils containing residue from animal burial (e.g. former abattoir sites).

7. DATA QUALITY OBJECTIVES

NEPM ASC 2013 provides guidance on the development of data quality objectives (DQO) using a seven-step process.

The DQO for this project are set out in **Sections 7.1** to **7.7** of this report.

7.1. Step 1: State the problem

The first step involves summarising the contamination problem that requires new environmental data and identifying resources available to solve the problem.

The objectives of this project are to:

- Assess the potential for contamination to be present on the site as a result of past and current land use activities;
- Provide advice on whether the site would be suitable (in the context of land contamination) for the proposed land use setting; and
- Provide recommendations for further investigation, management and/or remediation (if warranted).

The project is being undertaken because:

- The site is proposed for demolition of existing structures and construction of two residential flat buildings and the associated residential subdivision of land; and
- A Detailed Site Investigation is required to investigate potential contamination within the identified areas of environmental concern (AEC) as outlined in SE 2023.

The project team identified for this project consists of suitably experienced environmental consultants from SE.

The regulatory authorities identified for this project include NSW EPA and Northern Beaches Council.

7.2. Step 2: Identify the decision/goal of the study

The second step involves identifying decisions that need to be made about the contamination problem and the new environmental data required to make them.

The decisions that need to be made during this project include:

- Is the environmental data collected for the project, suitable for assessing relevant land contamination exposure risks?
- Do the concentrations of identified contaminants of potential concern (COPC) present an unacceptable exposure risk to identified receptors, for the proposed land use setting?
- Is the site suitable for the proposed land use setting, in the context of land contamination?

7.3. Step 3: Identify the information inputs

The third step involves identifying the information needed to support decisions and whether new environmental data will be needed.

The inputs required to make the decisions set out in **Section 7.2** for this project, will include:

- Data obtained during searches of the site's history;
- The nature and extent of sampling at the site, including both density and distribution;
- Samples of relevant site media;
- The measured physical and/or chemical parameters of the site media samples (including field screening and laboratory analysis, where relevant); and
- Assessment criteria adopted for each of the media sampled.

Taking into consideration the objectives of this project, and the conceptual site model and land use setting presented in **Section 5** of this project, the following assessment criteria relevant to the proposed land use setting have been adopted for this project:

- Human health direct contact – HILs in Table 1A (1) in NEPM ASC 2013 and HSLs in Table B4 of Friebel, E & Nadebaum, P (2011);
- Human health inhalation/vapour intrusion – HSLs in Table 1 (A) in NEPM ASC 2013;
- Human health (asbestos) – absence / presence for preliminary screening, and no visible ACM on surface;
- Petroleum hydrocarbon compounds (management limits) – Table 1 B (7) of NEPM ASC 2013; and
- Aesthetics – no highly malodorous site media (e.g. strong residual petroleum hydrocarbon odours, hydrogen sulphide in site media, organosulfur compounds), no hydrocarbon sheen on surface water, no discoloured chemical deposits or soil staining with chemical waste other than of a very minor nature, no large monolithic deposits of otherwise low risk material (e.g. gypsum as powder or plasterboard, cement kiln dust), no presence of putrescible refuse including material that may generate hazardous levels of methane such as a deep-fill profile of green waste or large quantities of timber waste, and no soils containing residue from animal burial (e.g. former abattoir sites).

7.4. Step 4: Define the boundaries of the study

The fourth step involves specifying the spatial and temporal aspects of the environmental media that the data must represent to support decisions.

The spatial extent of the project will be limited to the subject investigation area as defined by its boundaries (refer **Figure 2**).

The temporal boundaries of the project include:

- The project timeframe presented in the SE proposal for this project;
- Unacceptable weather conditions at the time of undertaking fieldwork, including rainfall, cold and/or heat;
- Access availability of the site (to be defined by the site owner/representative); and
- Availability of SE field staff (typically normal daylight working hours, Monday to Friday).

The lateral extent that contamination is expected to be distributed across, based on the conceptual site model, is defined by the inferred boundaries of the areas of environmental concern (AEC).

The vertical extent that contamination is expected to be distributed across, based on the conceptual site model and the project scope, is likely to be limited to shallow soils and fill material.

The scale of the decisions required will be based on the entire site.

Constraints which may affect the carrying out of this project may include access limitations, presence of above and below ground infrastructure, and hazards creating health and safety risks.

7.5. Step 5: Develop the analytical approach (or decision rule)

The fifth step involves defining the parameter of interest, specifying the action level, and integrating information from Steps 1 to 4 into a single statement that gives a logical basis for choosing between alternative actions.

7.5.1. Rinsate Blanks

Only disposable sampling equipment will be used during the field works on the day. As such, no rinsate blank will be collected.

7.5.2. Trip Spikes and Trip Blank Samples

One trip spike and trip blank sample will be used and scheduled for analysis, if site samples being collected that day are being analysed for volatile contaminants of concern (typically BTEX and/or TRH).

7.5.3. Field Duplicates and Field Triplicates

Field duplicate and field triplicates will be collected at a rate of one per twenty (5%) site samples collected. The duplicates and triplicates collected will be analysed for at least one of the analytes that the parent sample of the duplicate/triplicate is being scheduled for analysis for (with the exception of asbestos).

The relative percent difference (RPD) of concentrations of relevant analytes, between the parent sample and the duplicate/triplicate will be calculated.

7.5.4. Laboratory Analysis Quality Assurance / Quality Control

The analytical laboratory QA/QC program will typically include laboratory method blank samples, matrix spike samples, surrogate spike samples, laboratory control samples, and laboratory duplicate samples.

7.5.5. If/Then Decision Rules

SE has adopted the following 'if/then' decision rules for this project:

- If the result of the assessment of field data and laboratory analytical data is considered acceptable, then that field data and laboratory analytical data is suitable for interpretation within the scope of this project; and
- If the field data and laboratory analytical data is within the constraints of the assessment criteria adopted for this project (refer **Section 7.3**), then the contamination exposure risks to identified receptors, are considered acceptable.

In the event the assessment of field data and/or laboratory analytical data results in the data being not suitable for interpretation, then SE will determine if additional data is required to allow interpretation to be undertaken.

In the event that field data and/or laboratory analytical data exceeds the assessment criteria adopted for this project (refer **Section 7.3**), SE will undertake an assessment of the exceedance in the context of the project objectives to determine if additional data is required and whether management and/or remediation is required.

7.6. Step 6: Specify the performance or acceptance criteria

The sixth step involves specifying the decision maker's acceptable limits on decision errors, which are used to establish performance goals for limiting uncertainties in the data. When assessing contaminated land, there are generally two types of errors in decision making:

- Contamination exposure risks for a specific land use setting are acceptable, when they are not; and
- Contamination exposure risks for a specific land use setting are not acceptable, when they are.

SE will mitigate the risk of decision error by:

- Calculation of the 95% upper confidence limit (UCL) statistic to assess the mean concentration of relevant contaminants of potential concern where applicable i.e. where the highest concentration is less than 2.5 times the site adopted criteria, the standard deviation of the data is less than 50 % of the site adopted criteria, and the contaminant is not asbestos;
- Assignment of fieldwork tasks to suitably experienced SE consulting staff, and suitably experienced contractors;
- Assignment of laboratory analytical tasks to reputable NATA accredited laboratories; and
- Assignment of data interpretation tasks to suitably experienced SE consulting staff and outsourcing to technical experts where required.

SE will also adopt a range of data quality indicators (DQI) to facilitate assessment of the completeness, comparability, representativeness, precision and accuracy (bias).

Table 7.6.1 Performance and Acceptance Criteria Summary

Completeness			
Field Considerations	**Assessment Criterion**	**Laboratory Considerations**	**Assessment Criterion**
Critical locations sampled	Refer **Section 7.7.1**	Critical samples analysed according to DQO	Refer **Section 7.7.6**
Critical samples collected	Refer **Section 7.7.1**	Analytes analysed according to DQO	Refer **Section 7.7.6**
SOPs appropriate and complied with	100%	Appropriate laboratory analytical methods and LORs	Refer **Section 7.7.6**
Field documentation complete	All sampling point logs, calibration logs and chain of custody forms	Sample documentation complete	All sample receipt advices, all certificates of analysis
		Sample extraction and holding times complied with	Refer **Section 4.2.1**
Comparability			
Field Considerations	**Assessment Criterion**	**Laboratory Considerations**	**Assessment Criterion**
Same SOPs used on each occasion	100%	Same analytical methods used by primary laboratory	Refer **Section 4.2.1**
Climatic conditions	Samples stored in insulated containers with ice, immediately after collection	Same LORs at primary laboratory	Refer **Section 4.2.1**
Same types of samples collected, and handled/preserved in same manner	All soil samples same size, all stored in insulated containers with ice	Same laboratory for primary sample analysis	All primary samples to Eurofins | MGT
		Same analytical measurement units	Refer **Section 4.2.1**
Representativeness			
Field Considerations	**Assessment Criterion**	**Laboratory Considerations**	**Assessment Criterion**
Appropriate media sampled according to DQO	Refer **Section 7.7.6**	Samples analysed according to DQO	Refer **Section 7.7.6**
Media identified in DQO sampled	Refer **Section 7.7.6**		
Precision			
Field Considerations	**Assessment Criterion**	**Laboratory Considerations**	**Assessment Criterion**
Field duplicate / triplicate RPD	Minimum 5% duplicates and triplicates No limit for analytical results <10 times LOR 50% for analytical results 10-20 times LOR 30% for analytical results >10 times LOR	Laboratory duplicates	No exceedances of laboratory acceptance criteria
SOPs appropriate and complied with	100%		
Accuracy (bias)			
Field Considerations	**Assessment Criterion**	**Laboratory Considerations**	**Assessment Criterion**
Field trip spikes	Recoveries between 60% and 140%	Matrix spike recovery	No exceedances of laboratory acceptance criteria
Field trip blanks	Analyte concentration <LOR	Surrogate spike recovery	No exceedances of laboratory acceptance criteria

7.7. Step 7: Develop the plan for obtaining data

The seventh step involves identifying the most resource effective sampling and analysis design for generating the data that is required to satisfy the DQOs.

7.7.1. Sampling Point Density and Locations

Table A in NSW EPA *Sampling Design Guidelines* (2022) provides guidance on minimum sampling point densities required for site characterisation, based on detecting circular hot spots by using a systematic sampling pattern. This guidance assumes the investigator has little knowledge about the probable locations of the contamination, the distribution of the contamination is expected to be random (e.g. land fill sites) or the distribution of the contamination is expected to be fairly homogenous (e.g. agricultural lands).

As this project has included gathering data which provides a reasonable understanding of site history (in the context of potential areas of environmental concern on the site), accessibility constraints, and taking into consideration Table 1 in WA DOH (2009) and previous sampling by NG (2021), it is considered reasonable to adopt a systematic sampling pattern, with up to twenty-three (23) sampling points for the investigation area.

The locations of the sampling points are set out in **Figure 3**.

7.7.2. Sampling Methodology

The sampling point methodology presented in **Table 7.7.2** will be used for this project. The methodology is based on a range of factors considered relevant to this project, including:

- The identified contaminants of potential concern;
- The suspected laydown mechanisms for those contaminants of concern;
- The suspected likely depth of contamination; and
- Site specific constraints which affect the type of sampling techniques suited to the site.

Table 7.7.2 Proposed Sampling Methodology

AEC	Area	Sampling Point ID	Method	Target Depth of Sampling Point (m bgl)
PAEC01	Fill Materials Across Former Market Gardens	TP01-TP23	5 t excavator	1.0 m bgl, practical refusal or 0.3 m into inferred natural material, whichever occurs first.
PAEC02	On-site Structures	*Hazardous Building Materials Survey to be undertaken*		
PAEC03	Localised suspected ACM Impacts	TP01-TP23	5 t excavator	1.0 m bgl, practical refusal or 0.3 m into inferred natural material, whichever occurs first.
PAEC04	Fill material stockpiles along eastern and western boundaries of site	TP01-TP23	5 t excavator	1.0 m bgl, practical refusal or 0.3 m into inferred natural material, whichever occurs first.
PAEC05	Former Chemical/Pesticide Storage within Sheds	TP01-TP23	5 t excavator	1.0 m bgl, practical refusal or 0.3 m into inferred natural material, whichever occurs first.
PAEC06	Former Structure within 45 Warriewood Road	TP01-TP23	5 t excavator	1.0 m bgl, practical refusal or 0.3 m into inferred natural material, whichever occurs first.

Reference will also be made to Table 5 in WA DOH (2009) for the sampling and screening of fill soils for the presence of asbestos, where practical. The application of asbestos screening criteria published in NEPM ASC 2013 may be limited.

7.7.3. Identification, Storage and Handling of Samples

Sample identifiers will be used for each sample collected, based on the sampling point number and the depth/interval the sample was collected from, e.g. a sample collected from TP03 at a depth of 0.2m below ground level, would be identified as TP03-0.2.

Project samples will be stored in laboratory prepared glass and plastic containers (and zip lock bags if collected for asbestos or acid sulfate soil assessment).

Soil samples analysed for organic contaminants of concern (and acid sulfate soil samples) will be placed in insulated container/s with ice.

Samples will be transported to the relevant analytical laboratory, with chain of custody (COC) documentation that includes the following information:

- SE project identification number;
- Each sample identifier;
- Date each sample was collected;
- Sample type (e.g. soil or water);
- Container type/s for each sample collected;
- Preservation method used for each sample (e.g. ice);
- Analytical requirements for each sample and turnaround times; and
- Date and time of dispatch and receipt of samples (including signatures).

7.7.4. Decontamination

All sampling equipment used during the soil investigation consisted of location specific nitrile gloves, as such decontamination was deemed unnecessary. To avoid cross contamination via the excavator bucket, samples were collected from the centre of the soil formation, ensuring to avoid sampling materials which had come into contact with the excavator bucket.

Non-disposable equipment (if required) used during the investigation will be decontaminated before and in between sampling events, to mitigate potential for cross contamination between samples collected. The decontamination methodology to be adopted for this project will include:

- Washing relevant sampling equipment using potable water with a phosphate free detergent (i.e. Decon 90 or similar) mixed into water;
- Rinsing the washed non-disposable sampling equipment with distilled or de-ionised water; and
- Air drying as required.

7.7.5. Laboratory Selection

The analytical laboratories used for this project will be National Association of Testing Australia (NATA) accredited for the analysis undertaken.

7.7.6. Laboratory Analytical Schedule

Project samples will be scheduled for NATA accredited laboratory analysis, using a combination of:

- Observations made in the field of the media sampled; and
- The contaminants of potential concern (COPC) identified for the area of environmental concern that the sample was collected from.

4.2.1 Laboratory Holding Times, Analytical Methods and Limits of Reporting

The laboratory holding times, analytical methods and limits of reporting (LOR) being used for this project, are presented in **Table 7.7.1** and **Table 7.7.2** overleaf.

Table 7.7.1 Laboratory Holding Times, Analytical Methods, and Limit of Reporting (Primary Laboratory - Eurofins)

Analyte	Holding Time	Analytical Method	Limit of Reporting (mg/kg)
BTEX and TRH C_6-C_{10}	14 days	USEPA 5030, 8260B and 8020	0.2-0.5
TRH >C_{10}-C_{40}	14 days	USEPA 8015B & C	20-100
VOC	14 days	USEPA 8260	0.1-0.5
PAH	14 days	USEPA 8270	0.1-0.5
OCP	14 days	USEPA 8081	0.2
Nitrate	28 days	APHA 4500	5.0
Metals	6 months	USEPA 8015B & C	0.05 – 2
Asbestos	No limit	AS4964:2004	0.01 % w/w (qualitative)
Asbestos	No limit	Inhouse Method	0.001% w/w

Table 7.7.2 Laboratory Holding Times, Analytical Methods, and Limit of Reporting (Secondary Laboratory - ALS)

Analyte	Holding Time	Analytical Method	Limit of Reporting (mg/kg)
Metals	6 months	USEPA 200.8/3050/6010B	0.1-3
PAH	14 days	USEPA 8270	0.1

8. DETAILED SITE INVESTIGATION METHODOLOGY

Soil sampling and analysis were undertaken with reference to the following documents:

- NSW EPA 2022. *Contaminated Sites Sampling Design Guidelines,* NSW Environment Protection Authority.
- NEPM ASC 2013 *'National Environment Protection (Assessment of Site Contamination) Measure. Schedule B (2) Guideline on Data Collection, Sample Design and Reporting.'* National Environmental Protection Council, Adelaide.

8.1. Scope of Fieldworks

To clarify and quantify the existence of the potential contaminants, an indicative sampling analysis and quality plan (SAQP) was developed. The site works were performed on 19 July 2023 in accordance with the SAQP and supervised by SE environmental scientist at all times.

The scope of the investigation was developed based upon the findings of a Preliminary Site Investigation performed by SE and the SAQP subsequently developed. Based upon this approach the following scope of works was performed:

- Completion of a site-specific Safe Work Method Statement in accordance with SE health and safety policy;
- Completion of twenty-three (23) soil sampling locations within the cleared subject area (via 5 tonne excavator);
- Collection of discrete soil samples every 1.0 m recovered or change of strata from the soil test pits; and
- Analysis of twenty-three (23) primary soil samples and two (2) quality assurance / quality control (QA/QC) sample.

8.2. Laboratory Analysis

All soil samples will be forwarded to a NATA accredited laboratory for analysis of the analytes listed below. Eurofins | MGT Laboratory shall be used for the analysis of primary samples. ALS will be used for secondary / inter-laboratory QA/QC analysis.

9. FIELDWORK

9.1. Soil Sampling

Soil sampling was undertaken by SE on 19 July 2023. A total of twenty-three (23) test pits (TP01-TP23), were advanced across the accessible areas within the site using a 5-tonne excavator to a depth of 1.0 m bgs. Samples for potential analysis were collected from the near surface, at 1.0 m intervals within the soil profile or with change of strata, and in areas of observed contamination. Each soil sample was collected using a new clean pair of nitrile gloves and placed in the appropriate acid rinsed sample containers and plastic zip-lock bags provided by the laboratory.

Upon completion of the sampling, each borehole was backfilled with excavated soils at the completion of the sampling task at each sampling point. Soil borehole logs were maintained in the field by an SE environmental scientist for all exploratory locations. Field observations such as lithology, odours, staining, depth of water etc. were noted on the logs. The logs are presented in **Appendix B**.

Each sampling point established was marked on a site plan. The locations of these sampling points are presented in **Figure 3**.

9.2. Site Geology

Observations were made of soils encountered during sampling field work. These observations were recorded on environmental test pit logs. A copy of these logs is presented in **Appendix B**.

General soil materials encountered during the investigation included:

- 0 – 0.05 m bgs GRASS: Silty CLAY, high plasticity, dark grey-brown, dry; with high organic material;
- 0.05 – 0.3 m bgs TOPSOIL: Silty CLAY, high plasticity, dark grey-brown, dry; and
- 0.3 m+ m bgs INFERRED NATURAL: CLAY, medium plasticity, orange with red and grey mottle, dry to moist.

Fill materials encountered in TP02, TP05, TP13 and TP15 were generally found to comprise of the following stratigraphic units:

- 0 – 0.05 m bgs FILL: Silty CLAY, medium plasticity, dark grey-brown, dry, with high organic materials and foreign materials including glass;
- 0.05 – 0.4 m bgs FILL: Silty CLAY, medium plasticity, dark grey-brown, dry, with foreign materials including glass and some terra cotta;
- *TP04 and TP09:* 0 – 0.4 m bgs FILL: Silty SAND with gravel, coarse, well graded, medium grey-brown, dry-moist; and
- 0.4 m+ bgs: INFERRED NATURAL: CLAY, medium plasticity, grey / grey with orange and pale brown mottle, dry-moist.

Fill materials were encountered stockpiled materials in TP03, TP06, TP07, TP11, TP14, TP16, TP21 and TP23 consisting of:

- 0 – 0.05 m bgs FILL: Silty CLAY, medium plasticity, dark grey-brown, dry, with high organic materials and foreign materials including glass;
- 0.05 – 1.5 m bgs FILL: Silty CLAY, low plasticity, dark brown, dry to moist, with foreign materials including glass, some brick and terra cotta and plastics.

Refusal / bedrock was not encountered in any test pits extended across the site.

Photograph 9.2.1 Typical natural stratigraphy encountered within the site as observed in 'TP15'. As observed 19 July 2023.

Photograph 9.2.2 Natural clay materials identified through the site, as observed within 'TP12'. As observed 19 July 2023.

Photograph 9.2.3 FILL materials identified through portions of the site encountered within 'TP02', 'TP05', 'TP10', 'TP13' and 'TP15'. As observed 18 July 2023.

Photograph 9.2.4 FILL materials encountered within stockpiles across the site, encountered within 'TP03', 'TP06', 'TP07', 'TP11', 'TP14', 'TP16', 'TP21' and 'TP23'. As observed 18 July 2023.

Photograph 9.2.5 FILL materials identified through portions of the site encountered within 'TP04' and 'TP09'. As observed 18 July 2023.

9.3. Odours

Olfactory evidence of contamination was not observed across the remainder of the site or within any of the soil samples collected.

9.4. Staining

Visual evidence of staining was not observed across the site or within any of the soil samples collected.

9.5. Potential Asbestos Containing Materials

Suspected asbestos containing materials were identified in shallow soil materials at test pit locations 'TP08' and 'TP17', as well as on the residual soil surface within the vicinity of structures in the northern portion of the site. SE notes that due to vegetation overgrowth in the northern portion of the site visual assessment was generally limited to sampling point locations.

Due to the age on-site structures, there is a high potential for asbestos containing materials to be present within the building fabric. A hazardous building materials survey is required prior to any demolition works being undertaken.

Site Photograph 9.5.1 Potential Asbestos Containing Material observed within shallow fill materials encountered within TP17, as observed 18 July 2023.

Site Photograph 9.5.2 Stockpiled Potential Asbestos Containing Materials observed within the vicinity of TP17, as observed 18 July 2023.

Site Photograph 9.5.3 Overgrown vegetation encountered within the northern portion of the site, limiting visual assessment of surficial soils within the area, as observed 18 July 2023, facing east.

10. LABORATORY ANALYSIS

All samples collected were transported to the analytical laboratory, using chain of custody (COC) protocols. A selection of these samples was scheduled for analysis, with reference to the relevant COPC identified for the AEC that the samples were collected from.

All soil samples were forwarded to the NATA accredited laboratory for analysis of the analytes listed below. Eurofins Environment were used for the analysis of primary samples and SGS for the analysis of interlaboratory samples (if any).

Table 10.1 details the analysis undertaken for samples collected during the investigation.

Table 10.1 Sample Analytical Schedule

Sample ID	Analytical Suite									
	TRH	BTEX	PAH	Heavy Metals[1]	Asbestos Bulk ID[2]	OCP	PCBs	pH	CEC	Clay Content
TP02-0.2-0.3, TP04-0.2-0.3, TP06-0.2-0.3, TP08-0.2-0.3- TP10-0.2-0.3, TP12-0.2-0.3, TP14-0.2-0.3, TP16-0.2-0.3, TP18-0.2-0.3, TP20-0.2-0.3, TP22-0.2-0.3	x	x	x	x						
TP01-0.2-0.3, TP03-0.2-0.3, TP05-0.2-0.3, TP07-0.1-0.2, TP09-0.1-0.2 TP11-0.1-0.2, TP13-0.1-0.2, TP15-0.1-0.2	x	x	x	x		x	x			
EIL				X				x	x	x
TRIP BLANK / TRIP SPIKE		X								
DUP01, DUP01A, DUP02, DUP02A			x	x						

[1] 8 Metals: As, Cd, Cr, Cu, Hg, Ni, Pb, Zn; [2] Semi-quantitative asbestos identified per AS4986:2004

A copy of the analytical laboratory certificates of analysis, is presented in **Appendix C.**

The sample analytical results were tabulated and presented in the attached **Results Tables**.

11. DATA QUALITY INDICATOR ASSESSMENT

11.1. Completeness

An assessment of the completeness of data collected was undertaken, and the results presented in **Table 11.1**.

Table 11.1 Completeness DQI

Field Considerations	Target	Actual	Comment
Critical locations sampled	23	23	Performance against indicator considered acceptable.
Critical samples collected	23	23	Performance against indicator considered acceptable.
SOPs appropriate and complied with	100%	100%	Performance against indicator considered acceptable.
Field documentation complete	All sampling point logs, calibration logs and chain of custody forms	All sampling point logs, calibration logs and chain of custody forms	Performance against indicator considered acceptable.
Laboratory Considerations	**Target**	**Actual**	**Comment**
Critical samples analysed according to DQO	Refer **Section 7.7.6**	100%	Performance against indicator considered acceptable.
Analytes analysed according to DQO	Refer **Section 7.7.6**	100%	Performance against indicator considered acceptable.
Appropriate laboratory analytical methods and LORs	Refer **Section 4.2.1**	100%	Performance against indicator considered acceptable.
Sample documentation complete	All sample receipt advices, all certificates of analysis	100%	Performance against indicator considered acceptable.
Sample extraction and holding times complied with	Refer **Section 4.2.1**	100%	Performance against indicator considered acceptable.

The data collected is considered to be adequately complete within the objectives and constraints of the project.

11.2. Comparability

An assessment of the comparability of data collected was undertaken, and the results presented in **Table 11.2**.

Table 11.2 Comparability DQI

Field Considerations	Target	Actual	Comment
Same SOPs used on each occasion	100%	100%	Performance against indicator considered acceptable.
Climatic conditions	Samples stored in insulated containers with ice, immediately after collection	100%	Performance against indicator considered acceptable.
Same types of samples collected, and handled/preserved in same manner	All soil samples same size, all stored in insulated containers with ice	100%	Performance against indicator considered acceptable.
Laboratory Considerations	**Target**	**Actual**	**Comment**
Same analytical methods used by primary laboratory	Refer **Section 4.2.1**	100%	Performance against indicator considered acceptable.
Same LORs at primary laboratory	Refer **Section 4.2.1**	100%	Performance against indicator considered acceptable.
Same laboratory for primary sample analysis	All primary samples to Eurofins MGT	100%	Performance against indicator considered acceptable.
Same analytical measurement units	Refer **Section 4.2.1**	100%	Performance against indicator considered acceptable.

The data collected is considered to be adequately comparable within the objectives and constraints of the project.

11.3. Representativeness

An assessment of the representativeness of data collected was undertaken, and the results presented in **Table 11.3**.

Table 11.3. Representativeness DQI

Field Considerations	Target	Actual	Comment
Appropriate media sampled according to DQO	Refer **Section 7.7.2**	100%	Performance against indicator considered acceptable.
Media identified in DQO sampled	Refer **Section 7.7.2**	100%	Performance against indicator considered acceptable.
Laboratory Considerations	**Target**	**Actual**	**Comment**
Samples analysed according to DQO	Refer **Section 7.7.6**	Refer comments	Performance against indicator considered acceptable.

The data collected is considered to be adequately complete within the objectives and constraints of the project.

11.4. Precision

An assessment of the precision of data collected was undertaken, and the results presented in **Table 11.4**

Table 11.4. Precision DQI

Field Considerations	Target	Actual	Comment
Field duplicate / triplicate RPD	Minimum 5% duplicates and triplicates	8.7%	Parent duplicate/triplicate relationships are as follows: DUP01 – TP01-0.2-0.3; and DUP02 – TP19-0.2-0.3 Performance against indicator considered acceptable.
	No limit for analytical results <10 times LOR	Nil	
	50% for analytical results 10-20 times LOR	Nil	
	30% for analytical results >20 times LOR	Nil	
SOPs appropriate and complied with	100%	100%	Performance against indicator considered acceptable.
Laboratory Considerations	**Target**	**Actual**	**Comment**
Laboratory duplicates	No exceedances of laboratory acceptance criteria	Nil	Performance against indicator considered acceptable.

The data collected is considered to be adequately precise within the objectives and constraints of the project.

11.5. Accuracy

An assessment of the precision of data collected was undertaken, and the results presented in **Table 11.5**.

Table 11.5. Accuracy DQI

Field Considerations	Target	Actual	Comment
Field trip blanks	Analyte concentration <LOR	Analyte concentrations were < LOR	Performance against indicator considered acceptable.
Field trip spike	Field trip spikes	Recoveries between 60% and 140%	Performance against indicator considered acceptable.
Laboratory Considerations	**Target**	**Actual**	**Comment**
Laboratory method blank	No exceedances of laboratory acceptance criteria	No exceedances of laboratory acceptance criteria	Performance against indicator considered acceptable.
Matrix spike recovery	No exceedances of laboratory acceptance criteria	No exceedances of laboratory acceptance criteria	Performance against indicator considered acceptable.
Surrogate spike recovery	No exceedances of laboratory acceptance criteria	No exceedances of laboratory acceptance criteria	Performance against indicator considered acceptable.
Laboratory control sample recovery	No exceedances of laboratory acceptance criteria	No exceedances of laboratory acceptance criteria	Performance against indicator considered acceptable.

The data collected is considered to be adequately accurate within the objectives and constraints of the project.

12. DISCUSSION

A discussion on comparison of laboratory analytical results and field observations, in the context of the assessment criteria adopted for this project, is presented in **Sections 12.1** to **12.6**.

12.1. Human Health (Residential A)

12.1.1. Benzene, Toluene, Ethylbenzene, Xylenes, and Naphthalene (BTEXN)

The concentration of benzene, toluene, ethyl benzene, xylenes, and naphthalene in the soil samples analysed was less than the site adopted criteria (HSL-A) for human health risk via the vapour intrusion exposure pathway.

12.1.2. Heavy Metals

The concentration of heavy metals (arsenic, cadmium, chromium, copper, lead, nickel, zinc and mercury) in the soil samples analysed was less than the laboratory limit of reporting or site adopted criteria (HIL-A) for human health risk via the direct contact exposure pathway.

12.1.3. Total Recoverable Hydrocarbons (TRH)

The concentration of total recoverable hydrocarbons (C_6-C_{10}>C_{10}-C_{16}, >C_{16}-C_{34} and >C_{34}-C_{40}) in the soil samples analysed, was less than the laboratory limit of reporting or site adopted criteria (HSL-A) for vapour intrusion exposure.

12.1.4. Organochlorine Pesticides (OCP)

The concentration of organochlorine pesticide (OCP) compounds detected in the soil samples analysed was less than the laboratory limit of reporting or site adopted criteria (HIL-A) for human health risk via the direct contact exposure pathway.

12.1.5. Polycyclic Aromatic Hydrocarbons (PAH)

The concentration of polycyclic aromatic hydrocarbons (PAH) (Total PAH, and PAHs as Benzo(a)pyrene Toxicity Equivalence (B(a)P TEQ) in the soil samples analysed was less than the laboratory limit of reporting or site adopted criteria (HIL-A) for human health risk via the direct contact exposure pathway.

12.1.6. Polychlorinated Biphenyls (PCB)

The concentration of PCBs detected in the soil samples analysed was less than the laboratory limit of reporting or site adopted criteria (HIL-A) for human health risk via the direct contact exposure pathway.

12.1.7. Asbestos

Non-Friable Asbestos was not detected in the soil samples above the laboratory limit of reporting or adopted health screening level (0.01 % w/w).

Asbestos was detected within the two (2) fibre cement fragment submitted for analysis. Sample 'FC01' measured 40 x 35 x 3 mm, and was detected to contain Chrysotile and Amosite Asbestos, while sample 'TP08-FC' measured 60 x 55 x 5 mm, and was detected to contain Chrysotile and Amosite Asbestos. As the fibre cement fragments analysed were greater than 7 mm in two or more dimensions, could not be crushed by hand and were in good condition, the asbestos materials were classified as **Non-Friable**.

Friable Asbestos (FA) / Asbestos Fines (AF) was not detected in the soil samples above the laboratory limit of reporting or adopted health screening level (0.001 % w/w).

12.2. Petroleum Hydrocarbon Management Limits (Residential A)

The concentrations of TRH C_6-C_{10}, >C_{10}-C_{16} and >C_{34}-C_{40} detected within the soil samples analysed, were less than the applicable adopted management limits or less than laboratory limits of reporting.

12.3. Aesthetics

There was evidence of minor levels of scattered wastes encountered across the site surface within the vicinity of the site structure, minor levels of glass were encountered within surficial soils within the central and south-eastern portion of the site and minor levels of brick, plastics and glass were encountered within stockpiled soil materials. It is assumed that the waste will be removed as part of the redevelopment works in due course. As such, the aesthetics assessment criteria adopted for this project, indicate that no further assessment/management of these wastes would be required.

12.4. Terrestrial Ecosystems

EILs apply principally to contaminants in the top 2 m of soil at the finished surface/ground level which corresponds to the root zone and habitation zone of many species.

12.4.1. Ecological Screening Levels (ESLs)

The concentrations of Naphthalene, TRH C_6-C_{10}, >C_{10}-C_{16}, >C_{16}-C_{34}, and >C_{34}-C_{40}, Benzene, Toluene, Ethylbenzene, and Xylenes were less than the site adopted Ecological Screening Level (ESL) criteria for the site.

12.4.1. Ecological Investigation Levels (EILs)

The concentrations of relevant contaminants of concern detected in the soil samples analysed were less than the applicable adopted site-specific ecological investigation levels (EIL), with the exception of soils identified within 'TP06-0.2-0.3' which were found to exceed the applicable site criteria for Zinc (440 mg/kg *c.f.* 260 mg/kg). As the Zinc exceedance (440 mg/kg) was less than 250% of the EIL (260 mg/kg) and the standard deviation was less than 50% of the EIL (SD: 98 mg/kg), a 95% Upper Confidence Level (UCL) calculation was undertaken. The 95% UCL calculation for site Zinc (120 mg/kg) was less than the EIL.

12.5. Groundwater and Surface Water

Based on the historical and ongoing site use, visual assessment of the surface and fill materials within the site, and CoPC present within the soil samples collected, the contamination risk to surface and groundwater receptors was considered to be low.

13. REVISED CONCEPTUAL SITE MODEL

Following a review of site history and subsequent intrusive field analysis, areas of environmental concern (AEC) and contaminants of concern (COC) have been identified. The AECs identified and associated COC are presented in **Table 13.1** and **Figure 4.**

Table 13.1. Revised AEC and COPC

ID	Area of Environmental Concern	Source	Contaminants of Concern	Affected mediums	Exposure risk
AEC01	On Site Structures	Hazardous Building Materials	Asbestos, Lead, SMF, PCB	Building Materials	Human Health
AEC02	Site Footprints / Hardstand	Uncontrolled Filling and Demolition	Heavy metals, TRH, BTEX, PAH, OCP, OPP, PCB & Asbestos	Soil	Human Health, Ecological Health and Aesthetics
AEC03	Shallow Asbestos Impacted Fill Materials	Uncontrolled Filling and Demolition	Asbestos	Soil	Human Health
AEC04	Surficial Asbestos Materials	Uncontrolled Demolition	Asbestos	Soil	Human Health

The potential contamination pathways are considered to be as follows:

- Inhalation/ingestion of contaminants released in dust during redevelopment; and
- Direct contact, ingestion or inhalation of soil.

Relevant potential receptors are considered to include:

- Onsite construction and maintenance workers;
- Third parties during construction (adjacent site users and adjacent residents);
- Onsite flora and fauna;
- Future residents/end users; and
- Neighbouring residential land users.

14. CONCLUSIONS AND RECOMMENDATIONS

Based on SE's assessment of the desktop review information, fieldwork data and laboratory analytical data, in the context of the proposed redevelopment scenario, SE makes the following conclusions:

- Non-friable Asbestos Containing Materials (ACM) were identified within surficial soils (AEC02 and AEC03);
- The detected concentrations of the remaining identified contaminants of potential concern in the soils assessed are considered unlikely to present:
    - An unacceptable direct contact human health exposure risk; or
    - An unacceptable inhalation risk, with the exception of localised asbestos impacts (AEC02 and AEC03) discussed above; and
    - A petroleum hydrocarbon management risk;
- The detected concentrations of identified contaminants of potential concern in the soils characterised by samples assessed are considered unlikely to present an unacceptable ecological contamination risk;
- Underlying soil materials within AEC01 could not be assessed due to the presence of existing structures;
- Based on the assessments undertaken as part of this investigation, SE has concluded that the site is generally suitable for the proposed redevelopment subject to remediation of minor localised non-friable asbestos impacts (AEC02 and AEC03), and further characterisation of soils underlying existing on-site structures.

Based on the conclusions stated above and the background data gathered during the course of this investigation, SE recommends:

- Preparation of a Remedial Action Plan to outline the methodology to remediate minor localised shallow non-friable asbestos impacts and to further characterise previously inaccessible soils situated beneath the existing building footprints following demolition;
- Undertake a hazardous building materials survey of the structures present on-site prior to demolition;
- Following removal of hazardous building materials (if identified) and subsequent demolition of the onsite structures, a clearance inspection should be carried out by an appropriately qualified occupational hygienist / NSW LAA;
- A supplementary contamination assessment is to be undertaken beneath the building footprints following demolition by an appropriately experienced environmental scientist; and

A waste classification assessment must be carried out on any soil materials proposed for disposal off-site as per the NSW EPA Waste Classification Guidelines (2014). This report, including its conclusions and recommendations, must be read in conjunction with the limitations presented in **Section 15.**

15. STATEMENT OF LIMITATIONS

The findings presented in this report are based on specific searches of relevant, government historical databases and anecdotal information that were made available during the course of this investigation. To the best of our knowledge, these observations represent a reasonable interpretation of the general condition of the site at the time of report completion.

This report has been prepared solely for the use of the client to whom it is addressed and no other party is entitled to rely on its findings.

No warranties are made as to the information provided in this report. All conclusions and recommendations made in this report are of the professional opinions of personnel involved with the project and while normal checking of the accuracy of data has been conducted, any circumstances outside the scope of this report or which are not made known to personnel and which may impact on those opinions is not the responsibility of Sydney Environmental Group Pty Ltd. Should information become available regarding conditions at the site including previously unknown sources of contamination, SE reserves the right to review the report in the context of the additional information.

This report must be reviewed in its entirety and in conjunction with the objectives, scope and terms applicable to SE's engagement. The report must not be used for any purpose other than the purpose specified at the time SE was engaged to prepare the report.

Logs, figures, and drawings are generated for this report based on individual SE consultant interpretations of nominated data, as well as observations made at the time site walkover/s were completed.

Data and/or information presented in this report must not be redrawn for its inclusion in other reports, plans or documents, nor should that data and/or information be separated from this report in any way.

Should additional information that may impact on the findings of this report be encountered or site conditions change, SE reserves the right to review and amend this report.

16. REFERENCES

Sydney Environmental Group (SE 2023), 'Stage 1 Preliminary Site Investigation, 43, 45 & 49 Warriewood Road, Warriewood NSW', dated 7 July 2023, report ref: 2148-PSI-01-060723.v1f

NG Child & Associates (2021), 'Preliminary (Stage 1) Site Investigation, Proposed Residential Sub-Division, 45/49 Warriewood Road, Warriewood NSW', dated 16 November, report ref: CA/20/126-2701

NEPM ASC 2013, '*National Environmental Protection (Assessment of Site Contamination) Measure'.*

NSW EPA 2017, '*Contaminated Sites: Guidelines for the NSW Site Auditor Scheme (3rd edition)'.*

NSW EPA 2012, *'Guidelines for the Assessment and Management of Sites Impacted by Hazardous Ground Gases'*

NSW EPA 2020, '*Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites'*.

NSW EPA 2022, '*Contaminated Sites: Sampling Design Guidelines'.*

WA DOH 2009, '*Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia'* dated May 2009.

FIGURES

Source: Google Maps (Google.com/maps)

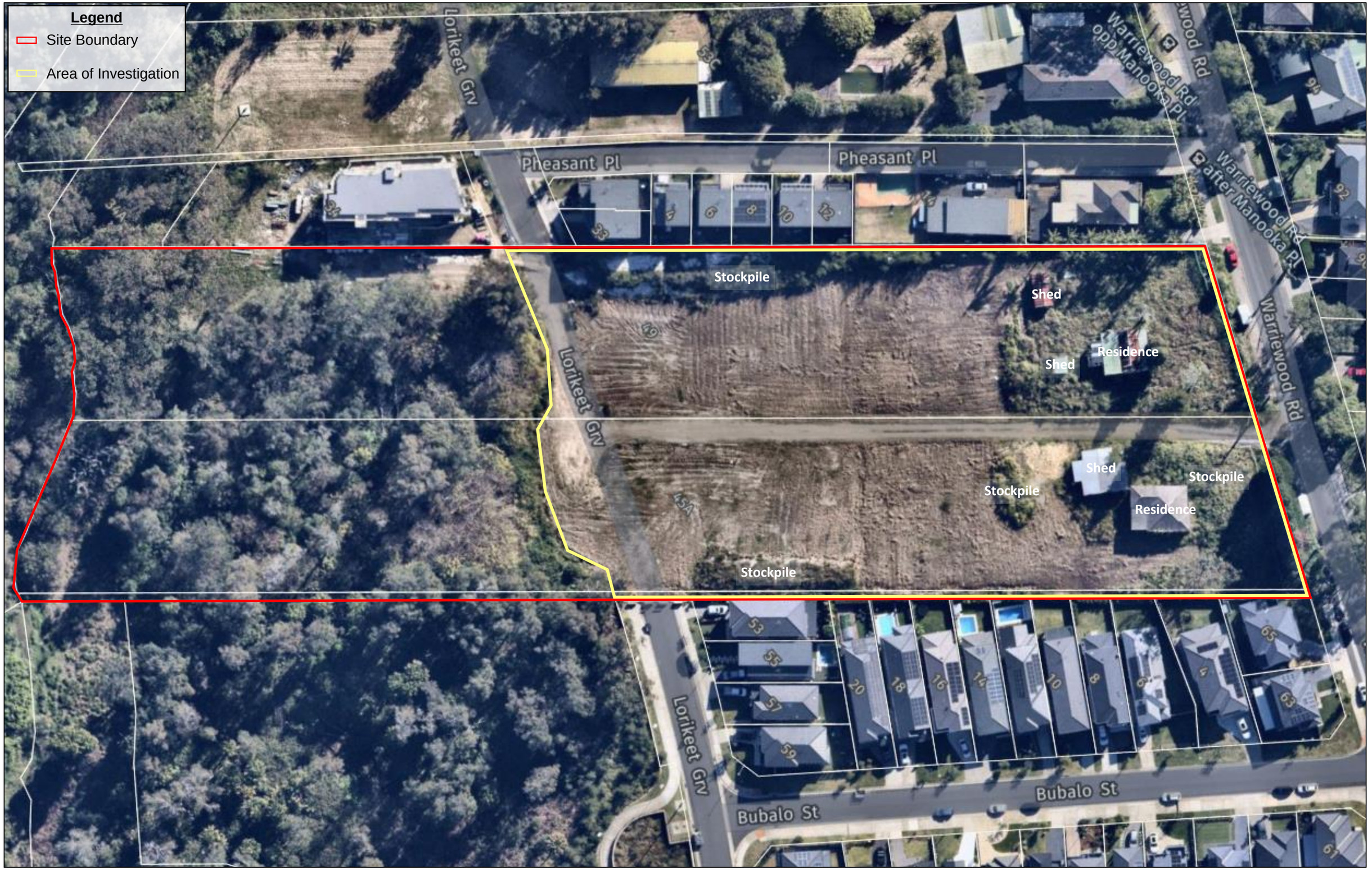
Subject Site
43-49 Warriewood Road, Warriewood NSW

Source: Nearmap (apps.nearmap.com.au)

Sydney Environmental Group

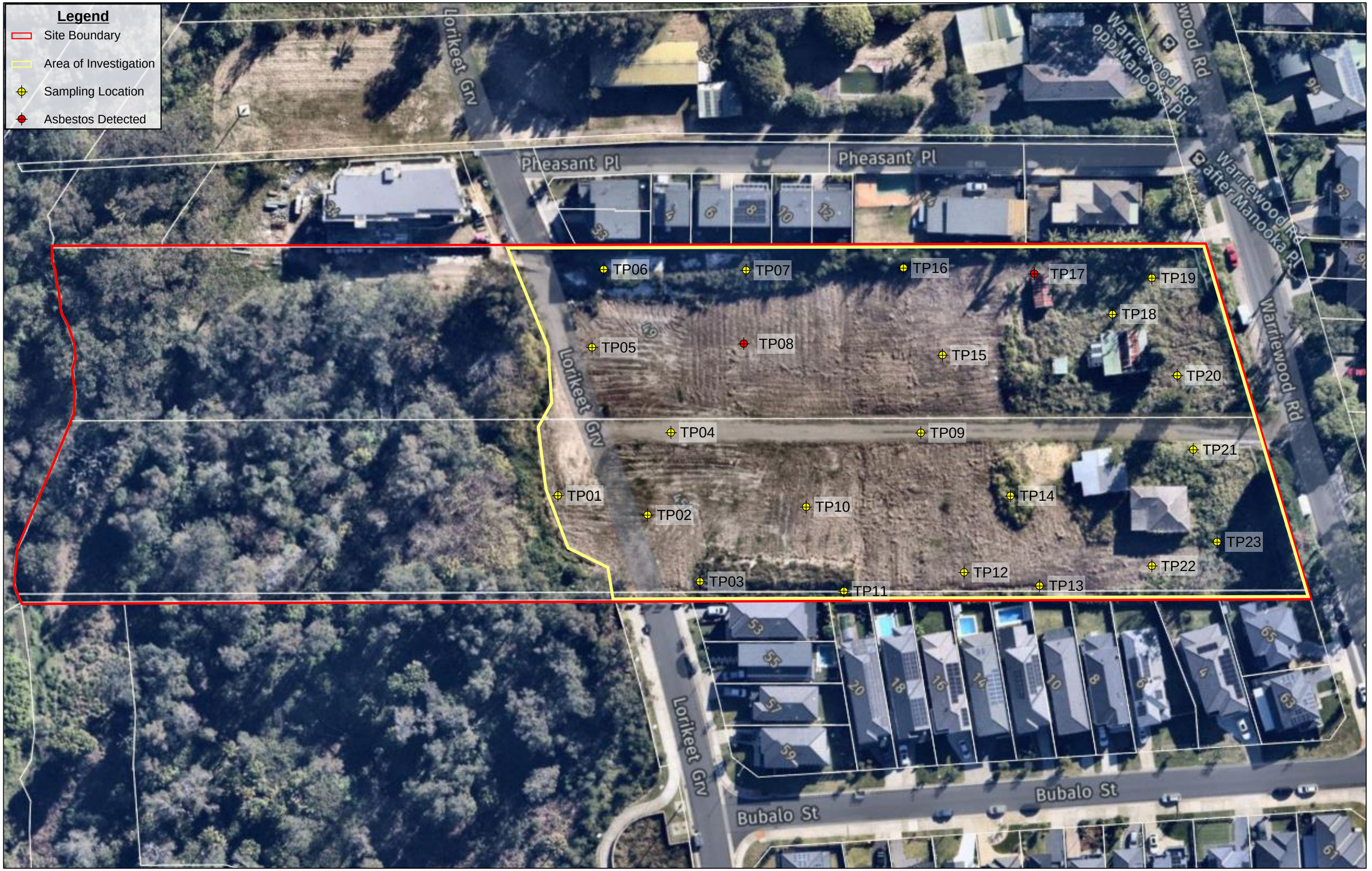
Scale:	100 m — Site Locality		
Client Name:	Universal Property Group (c/- Macpherson Kelley)	Figure Number:	1
Project Name:	Stage 2 Detailed Site Investigation	Figure Date:	24 July 2023
Project Location:	43, 45 & 49 Warriewood Road, Warriewood NSW	Report Number:	2148-DSI-01-280723.v1f

N



Scale:	25 m — Site Layout		
Client Name:	Universal Property Group (c/- Macpherson Kelley)	Figure Number:	2
Project Name:	Stage 2 Detailed Site Investigation	Figure Date:	24 July 2023
Project Location:	43, 45 & 49 Warriewood Road, Warriewood NSW	Report Number:	2148-DSI-01-280723.v1f

Sydney Environmental Group



Sydney Environmental Group	Scale: 25 m	Sampling Locations	
Client Name:	Universal Property Group (c/- Macpherson Kelley)		Figure Number: 3
Project Name:	Stage 2 Detailed Site Investigation		Figure Date: 24 July 2023
Project Location:	43, 45 & 49 Warriewood Road, Warriewood NSW		Report Number: 2148-DSI-01-280723.v1f

Scale:	25 m	Potential Areas of Environmental Concern	
Client Name:	Universal Property Group (c/- Macpherson Kelley)	Figure Number:	4
Project Name:	Stage 2 Detailed Site Investigation	Figure Date:	24 July 2023
Project Location:	43, 45 & 49 Warriewood Road, Warriewood NSW	Report Number:	2148-DSI-01-280723.v1f

Sydney Environmental Group

TABLES

				Site Adopted Criteria Residential A 0 m to <1 m | CLAY			Sample ID / Reference / Sample Date							TP01_0.2_0.3	TP02_0.2_0.3	TP03_0.2_0.3	TP04_0.2_0.3	TP05_0.2_0.3	TP06_0.2_0.3	TP07_1.1_1.2	TP08_0.2_0.3	TP09_0.2_0.3	TP10_0.2_0.3	TP11_0.2_0.3	TP12_0.2_0.3	TP13_0.2_0.3	TP14_0.2_0.3	TP15_0.2_0.3	TP16_0.2_0.3	TP17_0.2_0.3	TP18_0.2_0.3	TP19_0.2_0.3	TP20_0.2_0.3	TP21_0.2_0.3	TP22_0.2_0.3	TP23_0.2_0.3	DUP01	DUP02	EIL	DUP01a	DUP02a
Group	Analyte	Units	PQL	Health Investigation / Screening Level (HIL / HSL)	Environmental Investigation / Screening Level (EIL / ESL)	Petroleum Hydrocarbon Management Level (PHML)	# Samples	# Detects	Minimum	Average	Standard Deviation	95% UCL	Maximum	S23-J0041444 19/07/23	S23-J0041445 19/07/23	S23-J0041446 19/07/23	S23-J0041447 19/07/23	S23-J0041448 19/07/23	S23-J0041449 19/07/23	S23-J0041450 19/07/23	S23-J0041451 19/07/23	S23-J0041452 19/07/23	S23-J0041453 19/07/23	S23-J0041454 19/07/23	S23-J0041455 19/07/23	S23-J0041456 19/07/23	S23-J0041457 19/07/23	S23-J0041458 19/07/23	S23-J0041459 19/07/23	S23-J0041460 19/07/23	S23-J0041461 19/07/23	S23-J0041462 19/07/23	S23-J0041463 19/07/23	S23-J0041464 19/07/23	S23-J0041465 19/07/23	S23-J0041466 19/07/23	S23-J0041467 19/07/23	S23-J0041468 19/07/23	S23-J0041469 19/07/23	ES2324402001 19/07/23	ES2324402002 19/07/23
Metals	Arsenic	mg/kg	2	100	100	-	28	24	ND	4	3	-	15	3.7	4.6	5.6	3	9.8	15	4.7	3.1	4.7	< 2	5.1	4.1	5.8	2.7	5.2	4.1	3	4.1	< 2	5.9	5.6	4.8	7.3	3.6	3.5	< 2	6	< 5
	Cadmium	mg/kg	0.4	20	-	-	28	4	ND	0	0	-	0.6	< 0.4	0.6	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	0.4	0.5	< 0.4	< 0.4	< 0.4	0.5	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 1	< 1
	Chromium (Total)[1]	mg/kg	5	100	400	-	28	26	ND	16	16	-	81	11	45	18	13	28	8.6	11	13	23	12	27	15	81	5.7	< 5	13	8.2	6.5	< 5	11	22	6.4	15	10	6	10	28	5
	Copper	mg/kg	5	6000	130	-	28	21	ND	10	7	-	33	9	26	14	14	5.9	16	16	22	33	7.3	14	10	19	< 5	7.7	12	< 5	5.5	< 5	< 5	15	10	22	8.2	< 5	< 5	6	< 5
	Lead	mg/kg	5	300	1100	-	28	28	9	26	9	-	47	41	21	24	28	29	29	28	22	33	23	25	18	35	18	36	16	14	30	19	47	33	37	23	30	21	11	30	9
	Mercury (Inorganic)	mg/kg	0.1	40	-	-	28	5	ND	0	1	-	2	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	2	< 2
	Nickel	mg/kg	5	400	220	-	28	4	ND	1	0	-	8.8	< 5	< 5	< 5	8.2	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	8.8	< 5	< 5	< 5	< 5	8.7	< 5	8.8	< 5	< 5	< 5	< 0.1	<0.1
	Zinc	mg/kg	5	7400	260	-	28	27	ND	77	95	120	440	42	210	85	62	39	**440**	71	210	250	9.7	95	39	120	29	32	50	44	35	19	14	49	63	67	42	8.5	< 5	36	6
PAH	Acenaphthene	mg/kg	0.5	-	-	-	27	0	ND	NC	NC	-	ND	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5
	Acenaphthylene	mg/kg	0.5	-	-	-	27	0	ND	NC	NC	-	ND	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5
	Anthracene	mg/kg	0.5	-	-	-	27	0	ND	NC	NC	-	ND	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5
	Benzo(a)anthracene	mg/kg	0.5	-	-	-	27	0	ND	NC	NC	-	ND	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5
	Benzo(a)pyrene	mg/kg	0.5	-	0.7	-	27	0	ND	NC	NC	-	ND	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5
	BaP TEQ - Low[2]	mg/kg	0.5	3	-	-	27	0	ND	NC	NC	1.6	ND	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5
	BaP TEQ - Medium[2]	mg/kg	0.6	3	-	-	27	27	0.6	0.6	0.0	1.2	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	-	0.6	0.6
	BaP TEQ - High[2]	mg/kg	1.2	3	-	-	27	27	1.2	1.2	0.0	1.8	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	-	1.2	1.2
	Benzo(b&j)fluoranthene	mg/kg	0.5	-	-	-	27	0	ND	NC	NC	-	ND	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5
	Benzo(ghi)perylene	mg/kg	0.5	-	-	-	27	0	ND	NC	NC	-	ND	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5
	Benzo(k)fluoranthene	mg/kg	0.5	-	-	-	27	0	ND	NC	NC	-	ND	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5
	Chrysene	mg/kg	0.5	-	-	-	27	0	ND	NC	NC	-	ND	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5
	Dibenzo(ah)anthracene	mg/kg	0.5	-	-	-	27	0	ND	NC	NC	-	ND	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5
	Fluoranthene	mg/kg	0.5	-	-	-	27	0	ND	NC	NC	-	ND	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5
	Fluorene	mg/kg	0.5	-	-	-	27	0	ND	NC	NC	-	ND	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5
	Indeno(1,2,3-cd)pyrene	mg/kg	0.5	-	-	-	27	0	ND	NC	NC	-	ND	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5
	Naphthalene	mg/kg	0.5	-	170	-	27	0	ND	NC	NC	-	ND	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5
	Phenanthrene	mg/kg	0.5	-	-	-	27	0	ND	NC	NC	-	ND	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5
	Pyrene	mg/kg	0.5	-	-	-	27	0	ND	NC	NC	-	ND	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5
	Total PAH (18)	mg/kg	0.5	300	-	-	27	0	ND	NC	NC	-	ND	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5
TRH	TRH C10-C36 Total	mg/kg	50	-	-	-	23	0	ND	NC	NC	-	ND	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	-	-	-	-	-
	TRH C10-C14	mg/kg	20	-	-	-	23	0	ND	NC	NC	-	ND	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	-	-	-	-	-
	TRH C15-C28	mg/kg	50	-	-	-	23	0	ND	NC	NC	-	ND	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	-	-	-	-	-
	TRH C29-C36	mg/kg	50	-	-	-	23	0	ND	NC	NC	-	ND	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	-	-	-	-	-
	TRH C6-C9	mg/kg	20	-	-	-	23	0	ND	NC	NC	-	ND	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	-	-	-	-	-
	Naphthalene	mg/kg	0.5	-	170	-	23	0	ND	NC	NC	-	ND	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-	-	-	-	-
	TRH >C10-C16 (F2)	mg/kg	50	-	120	1000	23	0	ND	NC	NC	-	ND	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	-	-	-	-	-
	TRH >C10-C16 (F2) - Naphthalene	mg/kg	50	280	-	-	23	0	ND	NC	NC	-	ND	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	-	-	-	-	-
	TRH C10-C40 Total (F bands)	mg/kg	100	-	-	-	23	0	ND	NC	NC	-	ND	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
	TRH >C16-C34 (F3)	mg/kg	100	-	1300	3500	23	0	ND	NC	NC	-	ND	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
	TRH >C34-C40 (F4)	mg/kg	100	-	5600	10000	23	0	ND	NC	NC	-	ND	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
	TRH C6-C10	mg/kg	20	-	180	800	23	0	ND	NC	NC	-	ND	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	-	-	-	-	-
	TRH C6-C10 minus BTEX (F1)	mg/kg	20	50	-	-	23	0	ND	NC	NC	-	ND	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	-	-	-	-	-
BTEX	Benzene	mg/kg	0.1	0.7	65	-	23	0	ND	NC	NC	-	ND	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	-	-	-	-	-
	Ethylbenzene	mg/kg	0.1	NL	125	-	23	0	ND	NC	NC	-	ND	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	-	-	-	-	-
	m/p-xylene	mg/kg	0.2	-	-	-	23	0	ND	NC	NC	-	ND	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	-	-	-	-
	o-xylene	mg/kg	0.1	-	-	-	23	0	ND	NC	NC	-	ND	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	-	-	-	-	-
	Toluene	mg/kg	0.1	480	105	-	23	0	ND	NC	NC	-	ND	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	-	-	-	-	-
	Total Xylenes	mg/kg	0.3	110	45	-	23	0	ND	NC	NC	-	ND	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	-	-	-	-	-
OCP	4.4 - DDD	mg/kg	0.5	-	-	-	11	0	0.0	NC	NC	-	ND	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	-	-	-	-
	4.4 - DDE	mg/kg	0.5	-	-	-	11	1	0.1	0.0	NC	-	0.06	-	0.06	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	-	-	-	-
	4.4 - DDT	mg/kg	0.5	-	-	-	11	0	0.0	NC	NC	-	ND	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	-	-	-	-
	a-HCH	mg/kg	0.5	-	-	-	11	0	0.0	NC	NC	-	ND	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	-	-	-	-
	Aldrin	mg/kg	0.5	-	-	-	11	0	0.0	NC	NC	-	ND	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	-	-	-	-
	Aldrin + Dieldrin (total)	mg/kg	0.5	6	-	-	11	0	0.00	NC	NC	-	ND	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	-	-	-	-
	b-HCH	mg/kg	0.5	-	-	-	11	0	0.0	NC	NC	-	ND	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	-	-	-	-
	Chlordanes (total)	mg/kg	0.1	50	-	-	11	0	ND	NC	NC	-	ND	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	-	-	-	-	-
	d-HCH	mg/kg	0.1	-	-	-	11	0	ND	NC	NC	-	ND	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	-	-	-	-
	DDT + DDE + DDD (total)	mg/kg	0.1	240	-	-	11	1	ND	0.0	NC	-	0.06	-	0.06	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	-	-	-	-
	Dieldrin	mg/kg	0.1	-	-	-	11	0	ND	NC	NC	-	ND	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	-	-	-	-
	Endosulfan 1	mg/kg	0.1	-	-	-	11	0	ND	NC	NC	-	ND	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	-	-	-	-
	Endosulfan 2	mg/kg	0.1	-	-	-	11	0	ND	NC	NC	-	ND	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	-	-	-	-
	Endosulfan sulphate	mg/kg	0.1	-	-	-	11	0	ND	NC	NC	-	ND	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	-	-	-	-
	Endosulfan (Total)	mg/kg	0.1	270	-	-	11	0	ND	NC	NC	-	ND	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	-	-	-	-
	Endrin	mg/kg	0.1	10	-	-	11	0	ND	NC	NC	-	ND	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	-	-	-	-
	Endrin Aldehyde	mg/kg	0.1	-	-	-	11	0	ND	NC	NC	-	ND	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	-	-	-	-
	Endrin Ketone	mg/kg	0.1	-	-	-	11	0	ND	NC	NC	-	ND	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	-	-	-	-
	g-HCH (Lindane)	mg/kg	0.1	-	-	-	11	0	ND	NC	NC	-	ND	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	-	-	-	-
	Heptachlor	mg/kg	0.1	6	-	-	11	0	ND	NC	NC	-	ND	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	-	-	-	-
	Heptachlor epoxide	mg/kg	0.1	-	-	-	11	0	ND	NC	NC	-	ND	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	-	-	-	-
	Hexachlorobenzene	mg/kg	0.1	10	-	-	11	0	ND	NC	NC	-	ND	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	-	-	-	-
	Methoxychlor	mg/kg	0.2	300	-	-	11	0	0.0	NC	NC	-	ND	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	-	-	-	-
	Vic EPA IWRG 621 OCP (total)	mg/kg	0.1	-	-	-	11	0	ND	NC	NC	-	ND	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	-	-	-	-	-
	Vic EPA IWRG 621 Other OCP (total)	mg/kg	0.2	-	-	-	11	0	0.0	NC	NC	-	ND	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	-	-	-	-	-
PCBs	Total PCBs	mg/kg	0.5	1	-	-	11	0	0.0	NC	NC	-	ND	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	-	-	-	-	-

General Notes to Table: | - = Not Analysed | BTEX = Benzene, Toluene, Ethylbenzene, and Xylene | OCP = Organochlorine Pesticides | NC = Not Calculated | ND = Non-Detect | NL = Not Limiting | PAH = Polyaromatic Hydrocarbon |
| PCBs = Polychlorinated Biphenyls | PQL = Practical Quantification Limit | TRH = Total Recoverable Hydrocarbons | TEQ = Toxicity Equivalence Quotient | UCL = Upper Confidence Limit |

Notes to Statistical Calculations: The average and Standard Deviation are calculated with non-detects replaced with a null (0) proxy value. Where all values are non-detect, a "NC" value is ouputted.

Additional Notes: [1] HIL limits are for Chromuium (VI) only, and EIL limits are for Chromium (III) only, total Chromium measured for initial screening [2] Non-detect values are replaced with a proxy value with the proxy value being, Low: 0, Medium: 1/2 PQL, and High: PQL

Value	Highlighted concentration exceeds the site adopted criteria (HIL/HSL)
Value	Highlighted concentration exceeds the site adopted criteria (EIL/ESL)
Value	Highlight concentration exceeds the site adopted criteria (Petroleum Management Limit)
Value	Highlighted concentration exceeds multiple site adopted criterion

		Group	Asbestos		
		Analyte	Asbestos Sample Mass/Dimensions	Asbestos Sample Description	ACM
		Units	-	-	% w/w
		PQL	-	-	0.01
		Health Sceening Level (HSL)	-	-	0.01
	Site Adopted Criteria Residential A				
Sample ID	Reference / Sample Date			# Samples	25
				# Detects	0
				Minimum	ND
				Average	NC
				Standard Deviation	NC
				Maximum	ND
TP01_0.2_0.3	S23-JI0041444 19/07/23		101g	Brown coarse-grained sandy soil, sand stone, glass and rocks	< 0.01
TP02_0.2_0.3	S23-JI0041445 19/07/23		47g	Brown fine-grained clayey soil, organic debris and rocks	< 0.01
TP03_0.2_0.3	S23-JI0041446 19/07/23		62g	Brown fine-grained clayey soil, glass, plastic, organic debris and rocks	< 0.01
TP04_0.2_0.3	S23-JI0041447 19/07/23		64g	Brown fine-grained clayey soil, cement and rocks	< 0.01
TP05_0.2_0.3	S23-JI0041448 19/07/23		60g	Brown fine-grained clayey soil, organic debris and rocks	< 0.01
TP06_0.2_0.3	S23-JI0041449 19/07/23		76g	Brown fine-grained clayey soil, organic debris and rocks	< 0.01
TP07_1.1_1.2	S23-JI0041450 19/07/23		72g	Brown fine-grained clayey soil, organic debris, brick, cement and rocks	< 0.01
TP08_0.2_0.3	S23-JI0041451 19/07/23		37g	Brown fine-grained clayey soil, organic debris and rocks	< 0.01
TP09_0.2_0.3	S23-JI0041452 19/07/23		36g	Brown fine-grained clayey soil, organic debris, cement and rocks	< 0.01
TP10_0.2_0.3	S23-JI0041453 19/07/23		55g	Brown fine-grained clayey soil, organic debris and rocks	< 0.01
TP11_0.2_0.3	S23-JI0041454 19/07/23		87g	Brown fine-grained clayey soil, organic debris and rocks	< 0.01
TP12_0.2_0.3	S23-JI0041455 19/07/23		127g	Brown fine-grained clayey soil, organic debris and rocks	< 0.01
TP13_0.2_0.3	S23-JI0041456 19/07/23		67g	Brown fine-grained clayey soil, organic debris and rocks	< 0.01
TP14_0.2_0.3	S23-JI0041457 19/07/23		110g	Brown fine-grained clayey soil, organic debris and rocks	< 0.01
TP15_0.2_0.3	S23-JI0041458 19/07/23		75g	Brown coarse-grained sandy soil, organic debris and rocks	< 0.01
TP16_0.2_0.3	S23-JI0041459 19/07/23		102g	Brown coarse-grained sandy soil, organic debris and rocks	< 0.01
TP17_0.2_0.3	S23-JI0041460 19/07/23		68g	Brown coarse-grained sandy soil, organic debris and rocks	< 0.01
TP18_0.2_0.3	S23-JI0041461 19/07/23		53g	Brown coarse-grained sandy soil, organic debris and rocks	< 0.01
TP19_0.2_0.3	S23-JI0041462 19/07/23		29g	Brown coarse-grained sandy soil, organic debris and rocks	< 0.01
TP20_0.2_0.3	S23-JI0041463 19/07/23		46g	Brown coarse-grained sandy soil, organic debris and rocks	< 0.01
TP21_0.2_0.3	S23-JI0041464 19/07/23		83g	Brown coarse-grained sandy soil, organic debris and rocks	< 0.01
TP22_0.2_0.3	S23-JI0041465 19/07/23		87g	Brown coarse-grained sandy soil, organic debris, cement and rocks	< 0.01
TP23_0.2_0.3	S23-JI0041466 19/07/23		41g	Brown coarse-grained sandy soil, organic debris, bitumen and rocks	< 0.01
FC-01	S23-JI0041478 19/07/23		10 g	Grey fibre cement fragment (40 x 35 x 3 mm)	Chrysotile and Amosite Asbestos
TP08-FC	S23-JI0041479 19/07/23		40 g	Grey fibre cement fragment (60 x 55 x 5 mm)	Chrysotile and Amosite Asbestos

General Notes to Table: | - = Not Analysed | ACM = Asbestos Containing Material | AF = Asbestos Fines | FA = Fibrous Asbestos | NC = Not Calculated | ND = Non-Detect |

| NL = Not Limiting |PQL = Practical Quantification Limit

Notes to Statistical Calculations: The Average and Standard Deviation are calculated with non-detects replaced with a null (0) proxy value. Where all values are non-detect, a "NC" value is ouputted.

Value Highlighted concentration exceeds the site adopted criteria (HIL)

Group	Analyte	Units	Eurofins PQL	SGS PQL	Sample ID	DUP01	TP01_0.2_0.3	RPD Limit	RPD	DUP01	dup02a	RPD Limit	RPD	DUP02	TP19_0.2_0.3	RPD Limit	RPD	DUP02	DUP02a	RPD Limit	RPD
					Reference /Sample Date	S23-Jl0041467 19/07/23	S23-Jl0041444 19/07/23			S23-Jl0041467 19/07/23	00/01/00			S23-Jl0041468 19/07/23	S23-Jl0041462 19/07/23			S23-Jl0041468 19/07/23	ES2324402002 19/07/23		
Metals	Arsenic	mg/kg	2	1		3.6	3.7	NL	3	3.6	6	NL	50	3.5	< 2	NL	NC	3.5	< 5	NL	NC
	Cadmium	mg/kg	0.4	0.3		< 0.4	< 0.4	NL	NC	< 0.4	< 1	NL	NC	< 0.4	< 0.4	NL	NC	< 0.4	< 1	NL	NC
	Chromium (Total)	mg/kg	5	1		10	11	NL	10	10	28	NL	95	6	< 5	NL	NC	6	5	NL	18
	Copper	mg/kg	5	1		8.2	9	NL	9	8.2	6	NL	31	< 5	< 5	NL	NC	< 5	< 5	NL	NC
	Lead	mg/kg	5	1		30	41	NL	31	30	30	NL	0	21	19	NL	10	21	9	NL	80
	Mercury (Inorganic)	mg/kg	0.1	0.05		< 0.1	< 0.1	NL	NC	< 0.1	2	NL	NC	< 0.1	< 0.1	NL	NC	< 0.1	< 2	NL	NC
	Nickel	mg/kg	5	1		< 5	< 5	NL	NC	< 5	< 0.1	NL	NC	< 5	< 5	NL	NC	< 5	<0.1	NL	NC
	Zinc	mg/kg	5	2		42	42	NL	0	42	36	NL	15	8.5	19	NL	76	8.5	6	NL	34
PAH	Acenaphthene	mg/kg	0.5	0.1		< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC
	Acenaphthylene	mg/kg	0.5	0.1		< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC
	Anthracene	mg/kg	0.5	0.1		< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC
	Benzo(a)anthracene	mg/kg	0.5	0.1		< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC
	Benzo(a)pyrene	mg/kg	0.5	0.1		< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC
	BaP TEQ - Low[2]	mg/kg	0.5	0.2		< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC
	BaP TEQ - Medium[2]	mg/kg	0.6	0.3		0.6	0.6	NL	0	0.6	0.6	NL	0	0.6	0.6	NL	0	0.6	0.6	NL	0
	BaP TEQ - High[2]	mg/kg	1.2	0.2		1.2	1.2	NL	0	1.2	1.2	NL	0	1.2	1.2	NL	0	1.2	1.2	NL	0
	Benzo(b&j)fluoranthene	mg/kg	0.5	0.1		< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC
	Benzo(ghi)perylene	mg/kg	0.5	0.1		< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC
	Benzo(k)fluoranthene	mg/kg	0.5	0.1		< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC
	Chrysene	mg/kg	0.5	0.1		< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC
	Dibenzo(ah)anthracene	mg/kg	0.5	0.1		< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC
	Fluoranthene	mg/kg	0.5	0.1		< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC
	Fluorene	mg/kg	0.5	0.1		< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC
	Indeno(1,2,3-cd)pyrene	mg/kg	0.5	0.1		< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC
	Naphthalene	mg/kg	0.5	0.1		< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC
	Phenanthrene	mg/kg	0.5	0.1		< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC
	Pyrene	mg/kg	0.5	0.1		< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC
	Total PAH (18)	mg/kg	0.5	0.8		< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC	< 0.5	< 0.5	NL	NC

	TRIP SPIKE	TRIP BLANK
	TRIP SPIKE	TRIP BLANK
	Soil	Soil
	Recovery (%)	Concentration
Analyte	%	mg/kg
Benzene	110	< 0.1
Ethylbenzene	98	< 0.1
m/p-Xylene	97	< 0.2
o-Xylene	96	< 0.1
Toluene	98	< 0.1
Total Xylenes	97	< 0.3

Value **Value outside assessment criteria**

General Notes to Table: | - = Not Analysed | NC = Not Calculated | ND = Non-Detect | PAH = Polyaromatic Hydrocarbon |

| PQL = Practical Quantification Limit | RPD = Relative Percentage Difference | TEQ = Toxicity Equivalence Quotient |

Notes to RPD limits: Limits vary according based on a comparison of the parent sample concentration and the PQL for each analyte.

The following RPD limits apply: analyte concentration < 10x PQL: No RPD limit; > 10x < 20x PQL, 50% RPD limit; > 20x PQL, 30% RPD limit.

Value Highlighted value exceeds the site adopted RPD criteria

APPENDIX A

TEST PIT LOGS

Sydney Environmental Group

Environmental Test Pit TP01

PROJECT NUMBER 2148
PROJECT NAME DSI
CLIENT Macpherson Kelly
ADDRESS 43-49 Warriewood Road, Warriewood NSW

WORKS DATE 18/07/2023
EXCAVATION METHOD Excavator
EXCAVATOR CO. Smart Scan
OPERATOR Paris
TOTAL DEPTH 1.5 m

LOGGED BY TB
CHECKED BY MK

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0			CL	FILL: Silty CLAY with sands, pale brown, low plasticity, dry, high organic matter.	Foreign materials including bricks, timber and concrete observed.
0.1			CL	FILL: Silty CLAY with sands, pale brown, low plasticity, dry.	
0.2	TP01-0.2-0.3				
0.3					
0.4					
0.5					
0.6					
0.7					
0.8			CL	TOPSOIL: Silty CLAY, medium plasticity, dark brown, moist.	No contamination indicators observed.
0.9					
1					
1.1					
1.2			CL	INFERRED NATURAL: CLAY, medium plasticity, grey, moist.	
1.3					
1.4					
1.5				Termination Depth: 1.5 m	
1.6					
1.7					
1.8					
1.9					

Sydney Environmental Group

Environmental Test Pit TP02

PROJECT NUMBER 2148
PROJECT NAME DSI
CLIENT Macpherson Kelly
ADDRESS 43-49 Warriewood Road, Warriewood

WORKS DATE 18/07/2023
EXCAVATION METHOD Excavator
EXCAVATOR CO. Smart Scan
OPERATOR Paris
TOTAL DEPTH 0.7m

LOGGED BY TB
CHECKED BY MK

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			CL	FILL: Silty CLAY, dark grey, medium plasticity, dry-moist, high organic matter.	Foreign materials such as glass observed.
0.2	TP02-0.2-0.3		CL	FILL: Silty CLAY, dark grey, medium plasticity, dry-moist.	
0.3					
0.4			CL	INFERRED NATURAL: CLAY, medium plasticity, medium grey, dry-moist.	No contamination indicators observed.
0.5				▽	
0.6					
0.7				Termination Depth: 0.7m	
0.8					
0.9					
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

Sydney Environmental Group

Environmental Test Pit TP03 (SP)

PROJECT NUMBER 2148
PROJECT NAME DSI
CLIENT Macpherson Kelly
ADDRESS 43-49 Warriewood Road, Warriewood

WORKS DATE 18/07/2023
EXCAVATION METHOD Excavator
EXCAVATOR CO. Smart Scan
OPERATOR Paris
TOTAL DEPTH 1.8 m

LOGGED BY TB
CHECKED BY MK

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.0			CL	FILL: Silty CLAY, pale-medium brown, low plasticity, dry, high organic matter.	Foreign materials such as glass and terracotta observed.
0.1			CL	FILL: Silty CLAY, pale-medium brown, low plasticity, dry.	
0.2	TP03-0.2-0.3				
0.3					
0.4					
0.5					
0.6					
0.7					
0.8					
0.9					
1					
1.1					
1.2					
1.3					
1.4					
1.5			CL	INFERRED NATURAL: CLAY, medium plasticity, medium grey, dry-moist.	No contamination indicators observed.
1.6					
1.7					
1.8				Termination Depth: 1.8 m	
1.9					

Sydney Environmental Group

Environmental Test Pit TP04

PROJECT NUMBER 2148
PROJECT NAME DSI
CLIENT Macpherson Kelly
ADDRESS 43-49 Warriewood Road, Warriewood

WORKS DATE 18/07/2023
EXCAVATION METHOD Excavator
EXCAVATOR CO. Smart Scan
OPERATOR Paris
TOTAL DEPTH 0.9 m

LOGGED BY TB
CHECKED BY MK

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			CL	FILL: Silty CLAY with course gravel, grey-brown, low plasticity, dry.	Foreign materials such as glass observed.
0.2	TP04-0.2-0.3				
0.3					
0.4			CL	FILL: Silty CLAY, dark grey, medium plasticity, dry-moist.	
0.5					
0.6			CL	INFERRED NATURAL: CLAY, medium plasticity, medium grey, dry-moist.	No contamination indicators observed.
0.7					
0.8					
0.9				Termination Depth: 0.9 m	
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

Sydney Environmental Group

Environmental Test Pit TP05

PROJECT NUMBER 2148
PROJECT NAME DSI
CLIENT Macpherson Kelly
ADDRESS 43-49 Warriewood Road, Warriewood

WORKS DATE 18/07/2023
EXCAVATION METHOD Excavator
EXCAVATOR CO. Smart Scan
OPERATOR Paris
TOTAL DEPTH 0.9 m

LOGGED BY TB
CHECKED BY MK

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			CL	FILL: Silty CLAY, dark grey, medium plasticity, dry-moist, high organic matter.	Foreign materials such as glass observed.
0.2	TP05-0.2-0.3		CL	FILL: Silty CLAY, dark grey, medium plasticity, dry-moist.	
0.3					
0.4					
0.5					
0.6			CL	INFERRED NATURAL: CLAY, medium plasticity, medium grey, dry-moist.	No contamination indicators observed.
0.7					
0.8					
0.9				Termination Depth: 0.9 m	
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

Sydney Environmental Group

Environmental Test Pit TP06 (SP)

PROJECT NUMBER 2148
PROJECT NAME DSI
CLIENT Macpherson Kelly
ADDRESS 43-49 Warriewood Road, Warriewood

WORKS DATE 18/07/2023
EXCAVATION METHOD Excavator
EXCAVATOR CO. Smart Scan
OPERATOR Paris
TOTAL DEPTH 1.8 m

LOGGED BY TB
CHECKED BY MK

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			CL	FILL: Silty CLAY, pale-medium brown, low plasticity, dry, high organic matter.	Foreign materials such as glass and terracotta observed.
0.2	TP06-0.2-0.3		CL	FILL: Silty CLAY, pale-medium brown, low plasticity, dry.	
0.3					
0.4					
0.5					
0.6					
0.7					
0.8					
0.9					
1					
1.1					
1.2					
1.3					
1.4					
1.5			CL	INFERRED NATURAL: CLAY, medium plasticity, medium grey, dry-moist.	No contamination indicators observed.
1.6					
1.7					
1.8				Termination Depth: 1.8 m	
1.9					

Sydney Environmental Group

Environmental Test Pit TP07 (SP)

PROJECT NUMBER 2148
PROJECT NAME DSI
CLIENT Macpherson Kelly
ADDRESS 43-49 Warriewood Road, Warriewood

WORKS DATE 18/07/2023
EXCAVATION METHOD Excavator
EXCAVATOR CO. Smart Scan
OPERATOR Paris
TOTAL DEPTH 1.8 m

LOGGED BY TB
CHECKED BY MK

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			CL	FILL: Silty CLAY, pale-medium brown, low plasticity, dry, high organic matter.	Foreign materials such as glass and terracotta observed.
0.2	TP07-0.2-0.3		CL	FILL: Silty CLAY, pale-medium brown, low plasticity, dry.	
0.3					
0.4					
0.5					
0.6					
0.7					
0.8					
0.9					
1					
1.1	TP07-0.2-0.3				
1.2					
1.3					
1.4					
1.5			CL	INFERRED NATURAL: CLAY, medium plasticity, medium grey, dry-moist.	No contamination indicators observed.
1.6					
1.7					
1.8				Termination Depth: 1.8 m	
1.9					

Sydney Environmental Group

Environmental Test Pit TP08

PROJECT NUMBER 2148
PROJECT NAME DSI
CLIENT Macpherson Kelly
ADDRESS 43-49 Warriewood Road, Warriewood

WORKS DATE 18/07/2023
EXCAVATION METHOD Excavator
EXCAVATOR CO. Smart Scan
OPERATOR Paris
TOTAL DEPTH 0.6 m

LOGGED BY TB
CHECKED BY MK

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			CL	FILL: Silty CLAY, pale-medium brown, low plasticity, dry, high organic matter.	No contamination indicators observed.
0.2	TP08-0.2-0.3		CL	FILL: Silty CLAY, dark brown, medium plasticity, moist.	Foreign materials such as asbestos, glass and concrete observed.
0.3			CL	INFERRED NATURAL: CLAY, medium plasticity, medium grey, dry-moist.	No contamination indicators observed.
0.6				Termination Depth: 0.6 m	
0.7					
0.8					
0.9					
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

Sydney Environmental Group

Environmental Test Pit TP09

PROJECT NUMBER 2148
PROJECT NAME DSI
CLIENT Macpherson Kelly
ADDRESS 43-49 Warriewood Road, Warriewood

WORKS DATE 18/07/2023
EXCAVATION METHOD Excavator
EXCAVATOR CO. Smart Scan
OPERATOR Paris
TOTAL DEPTH 0.8 m

LOGGED BY TB
CHECKED BY MK

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			CL	FILL: Silty CLAY, grey-brown, low plasticity, dry.	No contamination indicators observed.
0.2	TP09-0.2-0.3				
0.3					
0.4					
0.5			CL	INFERRED NATURAL: CLAY, high plasticity, medium brown, dry-moist.	
0.6					
0.7					
0.8				Termination Depth: 0.8 m	
0.9					
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

Sydney Environmental Group

Environmental Test Pit TP10

PROJECT NUMBER 2148
PROJECT NAME DSI
CLIENT Macpherson Kelly
ADDRESS 43-49 Warriewood Road, Warriewood

WORKS DATE 18/07/2023
EXCAVATION METHOD Excavator
EXCAVATOR CO. Smart Scan
OPERATOR Paris
TOTAL DEPTH 0.6 m

LOGGED BY TB
CHECKED BY MK

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			CL	FILL: Silty CLAY, grey-brown, low plasticity, dry, high organic matter.	Foreign materials such as glass and concrete observed.
0.2	TP10-0.2-0.3		CL	FILL: Silty CLAY, grey-brown, low plasticity, dry.	
0.3			CL	INFERRED NATURAL: CLAY, high plasticity, medium brown, dry-moist.	No contamination indicators observed.
0.6				Termination Depth: 0.6 m	

Disclaimer This log is intended for environmental not geotechnical purposes.

Sydney Environmental Group

Environmental Test Pit TP11 (SP)

PROJECT NUMBER 2148
PROJECT NAME DSI
CLIENT Macpherson Kelly
ADDRESS 43-49 Warriewood Road, Warriewood

WORKS DATE 18/07/2023
EXCAVATION METHOD Excavator
EXCAVATOR CO. Smart Scan
OPERATOR Paris
TOTAL DEPTH 1.1 m

LOGGED BY TB
CHECKED BY MK

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0			CL	FILL: Silty CLAY, grey-brown, low plasticity, dry, high organic matter.	Foreign materials such as glass observed.
0.1			CL	FILL: Silty CLAY, grey-brown, low plasticity, dry.	
0.2	TP11-0.2-0.3				
0.3					
0.4					
0.5					
0.6					
0.7					
0.8			CL	INFERRED NATURAL: CLAY, low plasticity, grey, dry.	No contamination indicators observed.
0.9					
1					
1.1				Termination Depth: 1.1 m	
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

Sydney Environmental Group

Environmental Test Pit TP12

PROJECT NUMBER 2148
PROJECT NAME DSI
CLIENT Macpherson Kelly
ADDRESS 43-49 Warriewood Road, Warriewood

WORKS DATE 18/07/2023
EXCAVATION METHOD Excavator
EXCAVATOR CO. Smart Scan
OPERATOR Paris
TOTAL DEPTH 0.7 m

LOGGED BY TB
CHECKED BY MK

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			CL	TOPSOIL: Silty CLAY, grey-brown, low plasticity, dry, high organic matter.	No contamination indicators observed.
0.2	TP12-0.2-0.3		CL	TOPSOIL: Silty CLAY, dark grey-brown, high plasticity, dry.	
0.3			CL	INFERRED NATURAL: CLAY, medium plasticity, orange with red-grey mottling, dry-moist.	
0.4					
0.5					
0.6					
0.7				Termination Depth: 0.7 m	
0.8					
0.9					
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

Sydney Environmental Group

Environmental Test Pit TP13

PROJECT NUMBER 2148
PROJECT NAME DSI
CLIENT Macpherson Kelly
ADDRESS 43-49 Warriewood Road, Warriewood

WORKS DATE 18/07/2023
EXCAVATION METHOD Excavator
EXCAVATOR CO. Smart Scan
OPERATOR Paris
TOTAL DEPTH 0.8 m

LOGGED BY TB
CHECKED BY MK

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			CL	FILL: Silty CLAY, grey-brown, low plasticity, dry, high organic matter.	No contamination indicators observed.
0.2	TP13-0.2-0.3		CL	FILL: Silty CLAY, dark grey-brown, high plasticity, dry.	Foreign materials such as terracotta and metal observed.
0.3					
0.4					
0.5			CL	INFERRED NATURAL: CLAY, medium plasticity, orange with red-grey mottling, dry-moist.	No contamination indicators observed.
0.6					
0.7					
0.8				Termination Depth: 0.8 m	
0.9					
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

Sydney Environmental Group

Environmental Test Pit TP14 (SP)

PROJECT NUMBER 2148
PROJECT NAME DSI
CLIENT Macpherson Kelly
ADDRESS 43-49 Warriewood Road, Warriewood

WORKS DATE 18/07/2023
EXCAVATION METHOD Excavator
EXCAVATOR CO. Smart Scan
OPERATOR Paris
TOTAL DEPTH 0.9 m

LOGGED BY TB
CHECKED BY MK

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.0			CL	FILL: Silty CLAY, grey-brown, low plasticity, dry, high organic matter.	No contamination indicators observed.
0.1			CL	FILL: Silty CLAY, dark grey, medium plasticity, dry-moist.	Foreign materials such as glass and plastic observed.
0.2	TP14-0.2-0.3				
0.3					
0.4					
0.5					
0.6			CL	INFERRED NATURAL: CLAY, medium plasticity, orange with red-grey mottling, dry-moist.	No contamination indicators observed.
0.7					
0.8					
0.9				Termination Depth: 0.9 m	
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

Sydney Environmental Group

Environmental Test Pit TP15

PROJECT NUMBER 2148
PROJECT NAME DSI
CLIENT Macpherson Kelly
ADDRESS 43-49 Warriewood Road, Warriewood

WORKS DATE 18/07/2023
EXCAVATION METHOD Excavator
EXCAVATOR CO. Smart Scan
OPERATOR Paris
TOTAL DEPTH 0.7 m

LOGGED BY TB
CHECKED BY MK

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			CL	TOPSOIL: Silty CLAY, grey-brown, low plasticity, dry, high organic matter.	No contamination indicators observed.
0.2	TP15-0.2-0.3		CL	TOPSOIL: Silty CLAY, dark grey-brown, high plasticity, dry.	
0.3			CL	INFERRED NATURAL: CLAY, medium plasticity, orange with red-grey mottling, dry-moist.	
0.7				Termination Depth: 0.7 m	

Disclaimer This log is intended for environmental not geotechnical purposes.

Sydney Environmental Group

Environmental Test Pit TP16

PROJECT NUMBER 2148
PROJECT NAME DSI
CLIENT Macpherson Kelly
ADDRESS 43-49 Warriewood Road, Warriewood

WORKS DATE 18/07/2023
EXCAVATION METHOD Excavator
EXCAVATOR CO. Smart Scan
OPERATOR Paris
TOTAL DEPTH 0.9 m

LOGGED BY TB
CHECKED BY MK

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			CL	FILL: Silty CLAY, grey-brown, low plasticity, dry, high organic matter.	No contamination indicators observed.
0.2	TP16-0.2-0.3		CL	FILL: Silty CLAY, dark grey, medium plasticity, dry-moist.	Foreign materials such as glass and plastic observed.
0.3					
0.4					
0.5					
0.6			CL	INFERRED NATURAL: CLAY, medium plasticity, orange with red-grey mottling, dry-moist.	No contamination indicators observed.
0.7					
0.8					
0.9				Termination Depth: 0.9 m	
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

Sydney Environmental Group

Environmental Test Pit TP17

PROJECT NUMBER 2148
PROJECT NAME DSI
CLIENT Macpherson Kelly
ADDRESS 43-49 Warriewood Road, Warriewood

WORKS DATE 18/07/2023
EXCAVATION METHOD Excavator
EXCAVATOR CO. Smart Scan
OPERATOR Paris
TOTAL DEPTH 0.6 m

LOGGED BY TB
CHECKED BY MK

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			CL	FILL: Silty CLAY, dark grey-brown, high plasticity, dry, high organic matter.	Foreign materials such as asbestos observed.
			CL	FILL: Silty CLAY, dark grey-brown, high plasticity, dry.	
0.2	TP17-0.2-0.3		CL	INFERRED NATURAL: CLAY, medium plasticity, orange with red-grey mottling, dry-moist.	No contamination indicators observed.
0.3					
0.4					
0.5					
0.6				Termination Depth: 0.6 m	
0.7					
0.8					
0.9					
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

Sydney Environmental Group

Environmental Test Pit TP18

PROJECT NUMBER 2148
PROJECT NAME DSI
CLIENT Macpherson Kelly
ADDRESS 43-49 Warriewood Road, Warriewood

WORKS DATE 18/07/2023
EXCAVATION METHOD Excavator
EXCAVATOR CO. Smart Scan
OPERATOR Paris
TOTAL DEPTH 0.7 m

LOGGED BY TB
CHECKED BY MK

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			CL	TOPSOIL: Silty CLAY, grey-brown, low plasticity, dry, high organic matter.	No contamination indicators observed.
0.2	TP18-0.2-0.3		CL	TOPSOIL: Silty CLAY, dark grey-brown, high plasticity, dry.	
0.3			CL	INFERRED NATURAL: CLAY, medium plasticity, orange with red-grey mottling, dry-moist.	
0.7				Termination Depth: 0.7 m	

Disclaimer This log is intended for environmental not geotechnical purposes.

Sydney Environmental Group

Environmental Test Pit TP19

PROJECT NUMBER 2148
PROJECT NAME DSI
CLIENT Macpherson Kelly
ADDRESS 43-49 Warriewood Road, Warriewood

WORKS DATE 18/07/2023
EXCAVATION METHOD Excavator
EXCAVATOR CO. Smart Scan
OPERATOR Paris
TOTAL DEPTH 0.7 m

LOGGED BY TB
CHECKED BY MK

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0			CL	TOPSOIL: Silty CLAY, grey-brown, low plasticity, dry, high organic matter.	No contamination indicators observed.
0.1			CL	TOPSOIL: Silty CLAY, dark grey-brown, high plasticity, dry.	
0.2	TP19-0.2-0.3				
0.3			CL	INFERRED NATURAL: CLAY, medium plasticity, orange with red-grey mottling, dry-moist.	
0.4					
0.5					
0.6					
0.7				Termination Depth: 0.7 m	
0.8					
0.9					
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

Sydney Environmental Group

Environmental Test Pit TP20

PROJECT NUMBER 2148
PROJECT NAME DSI
CLIENT Macpherson Kelly
ADDRESS 43-49 Warriewood Road, Warriewood

WORKS DATE 18/07/2023
EXCAVATION METHOD Excavator
EXCAVATOR CO. Smart Scan
OPERATOR Paris
TOTAL DEPTH 0.7 m

LOGGED BY TB
CHECKED BY MK

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			CL	TOPSOIL: Silty CLAY, grey-brown, low plasticity, dry, high organic matter.	No contamination indicators observed.
0.2	TP20-0.2-0.3		CL	TOPSOIL: Silty CLAY, dark grey-brown, high plasticity, dry.	
0.3			CL	INFERRED NATURAL: CLAY, medium plasticity, orange with red-grey mottling, dry-moist.	
0.7				Termination Depth: 0.7 m	

Disclaimer This log is intended for environmental not geotechnical purposes.

Environmental Test Pit TP21 (SP)

PROJECT NUMBER 2148
PROJECT NAME DSI
CLIENT Macpherson Kelly
ADDRESS 43-49 Warriewood Road, Warriewood

WORKS DATE 18/07/2023
EXCAVATION METHOD Excavator
EXCAVATOR CO. Smart Scan
OPERATOR Paris
TOTAL DEPTH 1.1 m

LOGGED BY TB
CHECKED BY MK

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			CL	FILL: Silty CLAY, dark brown, medium plasticity, dry, high organic matter.	Foreign materials such as brick observed.
0.2	TP21-0.2-0.3		CL	FILL: Silty CLAY, dark brown, medium plasticity, dry.	
0.3					
0.4					
0.5					
0.6					
0.7					
0.8			CL	INFERRED NATURAL: CLAY, medium plasticity, orange with red-grey mottling, dry-moist.	No contamination indicators observed.
0.9					
1					
1.1				Termination Depth: 1.1 m	
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

Sydney Environmental Group

Environmental Test Pit TP22

PROJECT NUMBER 2148
PROJECT NAME DSI
CLIENT Macpherson Kelly
ADDRESS 43-49 Warriewood Road, Warriewood

WORKS DATE 18/07/2023
EXCAVATION METHOD Excavator
EXCAVATOR CO. Smart Scan
OPERATOR Paris
TOTAL DEPTH 0.7 m

LOGGED BY TB
CHECKED BY MK

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0			CL	TOPSOIL: Silty CLAY, grey-brown, low plasticity, dry, high organic matter.	No contamination indicators observed.
0.1			CL	TOPSOIL: Silty CLAY, dark grey-brown, high plasticity, dry.	
0.2	TP22-0.2-0.3				
0.3			CL	INFERRED NATURAL: CLAY, medium plasticity, orange with red-grey mottling, dry-moist.	
0.4					
0.5					
0.6					
0.7				Termination Depth: 0.7 m	
0.8					
0.9					
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

Sydney Environmental Group

Environmental Test Pit TP23

PROJECT NUMBER 2148
PROJECT NAME DSI
CLIENT Macpherson Kelly
ADDRESS 43-49 Warriewood Road, Warriewood

WORKS DATE 18/07/2023
EXCAVATION METHOD Excavator
EXCAVATOR CO. Smart Scan
OPERATOR Paris
TOTAL DEPTH 1.1 m

LOGGED BY TB
CHECKED BY MK

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0			CL	FILL: Silty CLAY, dark brown, medium plasticity, dry, high organic matter.	Foreign materials such as brick observed.
0.1			CL	FILL: Silty CLAY, dark brown, medium plasticity, dry.	
0.2	TP23-0.2-0.3				
0.3					
0.4					
0.5					
0.6					
0.7					
0.8			CL	INFERRED NATURAL: CLAY, medium plasticity, orange with red-grey mottling, dry-moist.	No contamination indicators observed.
0.9					
1					
1.1				Termination Depth: 1.1 m	
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

APPENDIX B

LABORATORY DOCUMENTATION

Sydney Environmental Group Pty Ltd
Unit 63/45 Huntley St
Alexandria
NSW 2015

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Mitchell Kirby**

Report **1009382-S**
Project name WARRIEWOOD DSI
Project ID 2148
Received Date Jul 19, 2023

Client Sample ID			**TP01_0.2_0.3**	**TP02_0.2_0.3**	**TP03_0.2_0.3**	**TP04_0.2_0.3**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S23-Jl0041444**	**S23-Jl0041445**	**S23-Jl0041446**	**S23-Jl0041447**
Date Sampled			**Jul 19, 2023**	**Jul 19, 2023**	**Jul 19, 2023**	**Jul 19, 2023**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	130	64	80	90
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			TP01_0.2_0.3	TP02_0.2_0.3	TP03_0.2_0.3	TP04_0.2_0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S23-JI0041444	S23-JI0041445	S23-JI0041446	S23-JI0041447
Date Sampled			Jul 19, 2023	Jul 19, 2023	Jul 19, 2023	Jul 19, 2023
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	83	85	90	91
p-Terphenyl-d14 (surr.)	1	%	74	78	79	81
Heavy Metals						
Arsenic	2	mg/kg	3.7	4.6	5.6	3.0
Cadmium	0.4	mg/kg	< 0.4	0.6	< 0.4	< 0.4
Chromium	5	mg/kg	11	45	18	13
Copper	5	mg/kg	9.0	26	14	14
Lead	5	mg/kg	41	21	24	28
Mercury	0.1	mg/kg	< 0.1	0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5	8.2
Zinc	5	mg/kg	42	210	85	62
Sample Properties						
% Moisture	1	%	15	29	9.1	8.4
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	-	< 0.1
4.4'-DDD	0.05	mg/kg	-	< 0.05	-	< 0.05
4.4'-DDE	0.05	mg/kg	-	0.06	-	< 0.05
4.4'-DDT	0.05	mg/kg	-	< 0.05	-	< 0.05
a-HCH	0.05	mg/kg	-	< 0.05	-	< 0.05
Aldrin	0.05	mg/kg	-	< 0.05	-	< 0.05
b-HCH	0.05	mg/kg	-	< 0.05	-	< 0.05
d-HCH	0.05	mg/kg	-	< 0.05	-	< 0.05
Dieldrin	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan I	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan II	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin ketone	0.05	mg/kg	-	< 0.05	-	< 0.05
g-HCH (Lindane)	0.05	mg/kg	-	< 0.05	-	< 0.05
Heptachlor	0.05	mg/kg	-	< 0.05	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	-	< 0.05
Methoxychlor	0.05	mg/kg	-	< 0.05	-	< 0.05
Toxaphene	0.5	mg/kg	-	< 0.5	-	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	0.06	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.1	-	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.1	-	< 0.1
Dibutylchlorendate (surr.)	1	%	-	76	-	66
Tetrachloro-m-xylene (surr.)	1	%	-	78	-	79

Client Sample ID			TP01_0.2_0.3	TP02_0.2_0.3	TP03_0.2_0.3	TP04_0.2_0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S23-JI0041444	S23-JI0041445	S23-JI0041446	S23-JI0041447
Date Sampled			Jul 19, 2023	Jul 19, 2023	Jul 19, 2023	Jul 19, 2023
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1221	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1232	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1242	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1248	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1254	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1260	0.1	mg/kg	-	< 0.1	-	< 0.1
Total PCB*	0.1	mg/kg	-	< 0.1	-	< 0.1
Dibutylchlorendate (surr.)	1	%	-	76	-	66
Tetrachloro-m-xylene (surr.)	1	%	-	78	-	79

Client Sample ID			TP05_0.2_0.3	TP06_0.2_0.3	TP07_1.1_1.2	TP08_0.2_0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S23-JI0041448	S23-JI0041449	S23-JI0041450	S23-JI0041451
Date Sampled			Jul 19, 2023	Jul 19, 2023	Jul 19, 2023	Jul 19, 2023
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	90	131	125	136
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			TP05_0.2_0.3	TP06_0.2_0.3	TP07_1.1_1.2	TP08_0.2_0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S23-JI0041448	S23-JI0041449	S23-JI0041450	S23-JI0041451
Date Sampled			Jul 19, 2023	Jul 19, 2023	Jul 19, 2023	Jul 19, 2023
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	95	87	91	88
p-Terphenyl-d14 (surr.)	1	%	78	81	83	75
Heavy Metals						
Arsenic	2	mg/kg	9.8	15	4.7	3.1
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	0.4
Chromium	5	mg/kg	28	8.6	11	13
Copper	5	mg/kg	5.9	16	16	22
Lead	5	mg/kg	29	29	28	22
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	39	440	71	210
Sample Properties						
% Moisture	1	%	17	19	16	16
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	-	< 0.1
4.4'-DDD	0.05	mg/kg	-	< 0.05	-	< 0.05
4.4'-DDE	0.05	mg/kg	-	< 0.05	-	< 0.05
4.4'-DDT	0.05	mg/kg	-	< 0.05	-	< 0.05
a-HCH	0.05	mg/kg	-	< 0.05	-	< 0.05
Aldrin	0.05	mg/kg	-	< 0.05	-	< 0.05
b-HCH	0.05	mg/kg	-	< 0.05	-	< 0.05
d-HCH	0.05	mg/kg	-	< 0.05	-	< 0.05
Dieldrin	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan I	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan II	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin ketone	0.05	mg/kg	-	< 0.05	-	< 0.05
g-HCH (Lindane)	0.05	mg/kg	-	< 0.05	-	< 0.05
Heptachlor	0.05	mg/kg	-	< 0.05	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	-	< 0.05
Methoxychlor	0.05	mg/kg	-	< 0.05	-	< 0.05
Toxaphene	0.5	mg/kg	-	< 0.5	-	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	< 0.05	-	< 0.05

Client Sample ID			TP05_0.2_0.3	TP06_0.2_0.3	TP07_1.1_1.2	TP08_0.2_0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S23-JI0041448	S23-JI0041449	S23-JI0041450	S23-JI0041451
Date Sampled			Jul 19, 2023	Jul 19, 2023	Jul 19, 2023	Jul 19, 2023
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.1	-	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.1	-	< 0.1
Dibutylchlorendate (surr.)	1	%	-	106	-	98
Tetrachloro-m-xylene (surr.)	1	%	-	82	-	80
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1221	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1232	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1242	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1248	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1254	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1260	0.1	mg/kg	-	< 0.1	-	< 0.1
Total PCB*	0.1	mg/kg	-	< 0.1	-	< 0.1
Dibutylchlorendate (surr.)	1	%	-	106	-	98
Tetrachloro-m-xylene (surr.)	1	%	-	82	-	80

Client Sample ID			TP09_0.2_0.3	TP10_0.2_0.3	TP11_0.2_0.3	TP12_0.2_0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S23-JI0041452	S23-JI0041453	S23-JI0041454	S23-JI0041455
Date Sampled			Jul 19, 2023	Jul 19, 2023	Jul 19, 2023	Jul 19, 2023
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	86	78	106	144
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			TP09_0.2_0.3	TP10_0.2_0.3	TP11_0.2_0.3	TP12_0.2_0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S23-JI0041452	S23-JI0041453	S23-JI0041454	S23-JI0041455
Date Sampled			Jul 19, 2023	Jul 19, 2023	Jul 19, 2023	Jul 19, 2023
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	86	88	91	91
p-Terphenyl-d14 (surr.)	1	%	76	71	76	79
Heavy Metals						
Arsenic	2	mg/kg	4.7	< 2	5.1	4.1
Cadmium	0.4	mg/kg	0.5	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	23	12	27	15
Copper	5	mg/kg	33	7.3	14	10
Lead	5	mg/kg	33	23	25	18
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	250	9.7	95	39
Sample Properties						
% Moisture	1	%	7.1	16	11	15
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	-	< 0.1
4.4'-DDD	0.05	mg/kg	-	< 0.05	-	< 0.05
4.4'-DDE	0.05	mg/kg	-	< 0.05	-	< 0.05
4.4'-DDT	0.05	mg/kg	-	< 0.05	-	< 0.05
a-HCH	0.05	mg/kg	-	< 0.05	-	< 0.05
Aldrin	0.05	mg/kg	-	< 0.05	-	< 0.05
b-HCH	0.05	mg/kg	-	< 0.05	-	< 0.05
d-HCH	0.05	mg/kg	-	< 0.05	-	< 0.05
Dieldrin	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan I	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan II	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin ketone	0.05	mg/kg	-	< 0.05	-	< 0.05

Client Sample ID			TP09_0.2_0.3	TP10_0.2_0.3	TP11_0.2_0.3	TP12_0.2_0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S23-JI0041452	S23-JI0041453	S23-JI0041454	S23-JI0041455
Date Sampled			Jul 19, 2023	Jul 19, 2023	Jul 19, 2023	Jul 19, 2023
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
g-HCH (Lindane)	0.05	mg/kg	-	< 0.05	-	< 0.05
Heptachlor	0.05	mg/kg	-	< 0.05	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	-	< 0.05
Methoxychlor	0.05	mg/kg	-	< 0.05	-	< 0.05
Toxaphene	0.5	mg/kg	-	< 0.5	-	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	< 0.05	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.1	-	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.1	-	< 0.1
Dibutylchlorendate (surr.)	1	%	-	86	-	85
Tetrachloro-m-xylene (surr.)	1	%	-	78	-	79
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1221	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1232	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1242	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1248	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1254	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1260	0.1	mg/kg	-	< 0.1	-	< 0.1
Total PCB*	0.1	mg/kg	-	< 0.1	-	< 0.1
Dibutylchlorendate (surr.)	1	%	-	86	-	85
Tetrachloro-m-xylene (surr.)	1	%	-	78	-	79

Client Sample ID			TP13_0.2_0.3	TP14_0.2_0.3	TP15_0.2_0.3	TP16_0.2_0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S23-JI0041456	S23-JI0041457	S23-JI0041458	S23-JI0041459
Date Sampled			Jul 19, 2023	Jul 19, 2023	Jul 19, 2023	Jul 19, 2023
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1

Client Sample ID			TP13_0.2_0.3	TP14_0.2_0.3	TP15_0.2_0.3	TP16_0.2_0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S23-JI0041456	S23-JI0041457	S23-JI0041458	S23-JI0041459
Date Sampled			Jul 19, 2023	Jul 19, 2023	Jul 19, 2023	Jul 19, 2023
Test/Reference	LOR	Unit				
BTEX						
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	86	136	138	131
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	93	85	91	96
p-Terphenyl-d14 (surr.)	1	%	75	78	86	77
Heavy Metals						
Arsenic	2	mg/kg	5.8	2.7	5.2	4.1
Cadmium	0.4	mg/kg	0.5	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	81	5.7	< 5	13
Copper	5	mg/kg	19	< 5	7.7	12
Lead	5	mg/kg	35	18	36	16
Mercury	0.1	mg/kg	0.2	0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5	8.8
Zinc	5	mg/kg	120	29	32	50
Sample Properties						
% Moisture	1	%	18	15	14	9.7
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	-	< 0.1
4.4'-DDD	0.05	mg/kg	-	< 0.05	-	< 0.05
4.4'-DDE	0.05	mg/kg	-	< 0.05	-	< 0.05
4.4'-DDT	0.05	mg/kg	-	< 0.05	-	< 0.05
a-HCH	0.05	mg/kg	-	< 0.05	-	< 0.05
Aldrin	0.05	mg/kg	-	< 0.05	-	< 0.05
b-HCH	0.05	mg/kg	-	< 0.05	-	< 0.05
d-HCH	0.05	mg/kg	-	< 0.05	-	< 0.05
Dieldrin	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan I	0.05	mg/kg	-	< 0.05	-	< 0.05

Client Sample ID			TP13_0.2_0.3	TP14_0.2_0.3	TP15_0.2_0.3	TP16_0.2_0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S23-JI0041456	S23-JI0041457	S23-JI0041458	S23-JI0041459
Date Sampled			Jul 19, 2023	Jul 19, 2023	Jul 19, 2023	Jul 19, 2023
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Endosulfan II	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin ketone	0.05	mg/kg	-	< 0.05	-	< 0.05
g-HCH (Lindane)	0.05	mg/kg	-	< 0.05	-	< 0.05
Heptachlor	0.05	mg/kg	-	< 0.05	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	-	< 0.05
Methoxychlor	0.05	mg/kg	-	< 0.05	-	< 0.05
Toxaphene	0.5	mg/kg	-	< 0.5	-	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	< 0.05	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.1	-	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.1	-	< 0.1
Dibutylchlorendate (surr.)	1	%	-	82	-	76
Tetrachloro-m-xylene (surr.)	1	%	-	74	-	81
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1221	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1232	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1242	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1248	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1254	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1260	0.1	mg/kg	-	< 0.1	-	< 0.1
Total PCB*	0.1	mg/kg	-	< 0.1	-	< 0.1
Dibutylchlorendate (surr.)	1	%	-	82	-	76
Tetrachloro-m-xylene (surr.)	1	%	-	74	-	81

Client Sample ID			TP17_0.2_0.3	TP18_0.2_0.3	TP19_0.2_0.3	TP20_0.2_0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S23-JI0041460	S23-JI0041461	S23-JI0041462	S23-JI0041463
Date Sampled			Jul 19, 2023	Jul 19, 2023	Jul 19, 2023	Jul 19, 2023
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100

Client Sample ID			TP17_0.2_0.3	TP18_0.2_0.3	TP19_0.2_0.3	TP20_0.2_0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S23-JI0041460	S23-JI0041461	S23-JI0041462	S23-JI0041463
Date Sampled			Jul 19, 2023	Jul 19, 2023	Jul 19, 2023	Jul 19, 2023
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	131	57	73	83
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	91	87	70	86
p-Terphenyl-d14 (surr.)	1	%	76	74	58	76
Heavy Metals						
Arsenic	2	mg/kg	3.0	4.1	< 2	5.9
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	8.2	6.5	< 5	11
Copper	5	mg/kg	< 5	5.5	< 5	< 5
Lead	5	mg/kg	14	30	19	47
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	44	35	19	14
Sample Properties						
% Moisture	1	%	15	14	15	15
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	-	< 0.1
4.4'-DDD	0.05	mg/kg	-	< 0.05	-	< 0.05
4.4'-DDE	0.05	mg/kg	-	< 0.05	-	< 0.05
4.4'-DDT	0.05	mg/kg	-	< 0.05	-	< 0.05
a-HCH	0.05	mg/kg	-	< 0.05	-	< 0.05

Client Sample ID			TP17_0.2_0.3	TP18_0.2_0.3	TP19_0.2_0.3	TP20_0.2_0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S23-JI0041460	S23-JI0041461	S23-JI0041462	S23-JI0041463
Date Sampled			Jul 19, 2023	Jul 19, 2023	Jul 19, 2023	Jul 19, 2023
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Aldrin	0.05	mg/kg	-	< 0.05	-	< 0.05
b-HCH	0.05	mg/kg	-	< 0.05	-	< 0.05
d-HCH	0.05	mg/kg	-	< 0.05	-	< 0.05
Dieldrin	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan I	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan II	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin ketone	0.05	mg/kg	-	< 0.05	-	< 0.05
g-HCH (Lindane)	0.05	mg/kg	-	< 0.05	-	< 0.05
Heptachlor	0.05	mg/kg	-	< 0.05	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	-	< 0.05
Methoxychlor	0.05	mg/kg	-	< 0.05	-	< 0.05
Toxaphene	0.5	mg/kg	-	< 0.5	-	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	< 0.05	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.1	-	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.1	-	< 0.1
Dibutylchlorendate (surr.)	1	%	-	79	-	85
Tetrachloro-m-xylene (surr.)	1	%	-	75	-	75
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1221	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1232	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1242	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1248	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1254	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1260	0.1	mg/kg	-	< 0.1	-	< 0.1
Total PCB*	0.1	mg/kg	-	< 0.1	-	< 0.1
Dibutylchlorendate (surr.)	1	%	-	79	-	85
Tetrachloro-m-xylene (surr.)	1	%	-	75	-	75

Client Sample ID			TP21_0.2_0.3	TP22_0.2_0.3	TP23_0.2_0.3	DUP01
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S23-JI0041464	S23-JI0041465	S23-JI0041466	S23-JI0041467
Date Sampled			Jul 19, 2023	Jul 19, 2023	Jul 19, 2023	Jul 19, 2023
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	-
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	-
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	-
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	-
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	-
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	-
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	-

Client Sample ID			TP21_0.2_0.3	TP22_0.2_0.3	TP23_0.2_0.3	DUP01
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S23-JI0041464	S23-JI0041465	S23-JI0041466	S23-JI0041467
Date Sampled			Jul 19, 2023	Jul 19, 2023	Jul 19, 2023	Jul 19, 2023
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	-
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	-
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	-
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	-
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	138	138	149	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	96	87	89	84
p-Terphenyl-d14 (surr.)	1	%	70	69	80	72
Heavy Metals						
Arsenic	2	mg/kg	5.6	4.8	7.3	3.6
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	22	6.4	15	10
Copper	5	mg/kg	15	10	22	8.2
Lead	5	mg/kg	33	37	23	30
Mercury	0.1	mg/kg	< 0.1	0.1	< 0.1	< 0.1
Nickel	5	mg/kg	8.7	< 5	8.8	< 5
Zinc	5	mg/kg	49	63	67	42
Sample Properties						
% Moisture	1	%	12	35	12	14

Client Sample ID			TP21_0.2_0.3	TP22_0.2_0.3	TP23_0.2_0.3	DUP01
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S23-JI0041464	S23-JI0041465	S23-JI0041466	S23-JI0041467
Date Sampled			Jul 19, 2023	Jul 19, 2023	Jul 19, 2023	Jul 19, 2023
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	-	-
4.4'-DDD	0.05	mg/kg	-	< 0.05	-	-
4.4'-DDE	0.05	mg/kg	-	< 0.05	-	-
4.4'-DDT	0.05	mg/kg	-	< 0.05	-	-
a-HCH	0.05	mg/kg	-	< 0.05	-	-
Aldrin	0.05	mg/kg	-	< 0.05	-	-
b-HCH	0.05	mg/kg	-	< 0.05	-	-
d-HCH	0.05	mg/kg	-	< 0.05	-	-
Dieldrin	0.05	mg/kg	-	< 0.05	-	-
Endosulfan I	0.05	mg/kg	-	< 0.05	-	-
Endosulfan II	0.05	mg/kg	-	< 0.05	-	-
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	-	-
Endrin	0.05	mg/kg	-	< 0.05	-	-
Endrin aldehyde	0.05	mg/kg	-	< 0.05	-	-
Endrin ketone	0.05	mg/kg	-	< 0.05	-	-
g-HCH (Lindane)	0.05	mg/kg	-	< 0.05	-	-
Heptachlor	0.05	mg/kg	-	< 0.05	-	-
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	-	-
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	-	-
Methoxychlor	0.05	mg/kg	-	< 0.05	-	-
Toxaphene	0.5	mg/kg	-	< 0.5	-	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05	-	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	< 0.05	-	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.1	-	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.1	-	-
Dibutylchlorendate (surr.)	1	%	-	91	-	-
Tetrachloro-m-xylene (surr.)	1	%	-	74	-	-
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1221	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1232	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1242	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1248	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1254	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1260	0.1	mg/kg	-	< 0.1	-	-
Total PCB*	0.1	mg/kg	-	< 0.1	-	-
Dibutylchlorendate (surr.)	1	%	-	91	-	-
Tetrachloro-m-xylene (surr.)	1	%	-	74	-	-

Client Sample ID			DUP02	EIL	TRIP SPIKE	TRIP BLANK
Sample Matrix			Soil	Soil	Trip Spike (solid)	Trip Blank (solid)
Eurofins Sample No.			S23-Jl0041468	S23-Jl0041469	S23-Jl0041470	S23-Jl0041471
Date Sampled			Jul 19, 2023	Jul 19, 2023	Jul 19, 2023	Jul 19, 2023
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	-	-	-	< 20
TRH C6-C10	20	mg/kg	-	-	-	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	-	-	< 20
BTEX						
Benzene	0.1	mg/kg	-	-	-	< 0.1
Toluene	0.1	mg/kg	-	-	-	< 0.1
Ethylbenzene	0.1	mg/kg	-	-	-	< 0.1
m&p-Xylenes	0.2	mg/kg	-	-	-	< 0.2
o-Xylene	0.1	mg/kg	-	-	-	< 0.1
Xylenes - Total*	0.3	mg/kg	-	-	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	-	-	88
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	-	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-	-	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	-	-
Acenaphthene	0.5	mg/kg	< 0.5	-	-	-
Acenaphthylene	0.5	mg/kg	< 0.5	-	-	-
Anthracene	0.5	mg/kg	< 0.5	-	-	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	-	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	-	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	-	-	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	-	-	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	-	-
Chrysene	0.5	mg/kg	< 0.5	-	-	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-	-	-
Fluoranthene	0.5	mg/kg	< 0.5	-	-	-
Fluorene	0.5	mg/kg	< 0.5	-	-	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-	-	-
Naphthalene	0.5	mg/kg	< 0.5	-	-	-
Phenanthrene	0.5	mg/kg	< 0.5	-	-	-
Pyrene	0.5	mg/kg	< 0.5	-	-	-
Total PAH*	0.5	mg/kg	< 0.5	-	-	-
2-Fluorobiphenyl (surr.)	1	%	89	-	-	-
p-Terphenyl-d14 (surr.)	1	%	75	-	-	-
Heavy Metals						
Arsenic	2	mg/kg	4.1	< 2	-	-
Cadmium	0.4	mg/kg	< 0.4	< 0.4	-	-
Chromium	5	mg/kg	7.0	10.0	-	-
Copper	5	mg/kg	< 5	< 5	-	-
Lead	5	mg/kg	25	11	-	-
Mercury	0.1	mg/kg	< 0.1	< 0.1	-	-
Nickel	5	mg/kg	< 5	< 5	-	-
Zinc	5	mg/kg	9.9	< 5	-	-
Sample Properties						
% Moisture	1	%	14	17	-	-

Client Sample ID			DUP02	EIL	TRIP SPIKE	TRIP BLANK
Sample Matrix			Soil	Soil	Trip Spike (solid)	Trip Blank (solid)
Eurofins Sample No.			S23-Jl0041468	S23-Jl0041469	S23-Jl0041470	S23-Jl0041471
Date Sampled			Jul 19, 2023	Jul 19, 2023	Jul 19, 2023	Jul 19, 2023
Test/Reference	LOR	Unit				
% Clay	1	%	-	25	-	-
Conductivity (1:5 aqueous extract at 25 °C as rec.)	10	uS/cm	-	52	-	-
pH (1:5 Aqueous extract at 25 °C as rec.)	0.1	pH Units	-	5.8	-	-
TRH C6-C10	1	%	-	-	100	-
Naphthalene[N02]	0.5	mg/kg	-	-	-	< 0.5
Cation Exchange Capacity						
Cation Exchange Capacity*	0.5	meq/100g	-	6.1	-	-
Total Recoverable Hydrocarbons						
Naphthalene	1	%	-	-	89	-
TRH C6-C9	1	%	-	-	100	-
BTEX						
Benzene	1	%	-	-	110	-
Ethylbenzene	1	%	-	-	98	-
m&p-Xylenes	1	%	-	-	97	-
o-Xylene	1	%	-	-	96	-
Toluene	1	%	-	-	98	-
Xylenes - Total	1	%	-	-	97	-
4-Bromofluorobenzene (surr.)	1	%	-	-	66	-

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Contam Suite 2 (TRH/BTEX/PAH/Metals/OCP/PCB/Asbestos)			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Jul 21, 2023	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jul 21, 2023	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jul 21, 2023	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Jul 21, 2023	14 Days
- Method: LTM-ORG-2010 BTEX and Volatile TRH			
Polycyclic Aromatic Hydrocarbons	Sydney	Jul 21, 2023	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Sydney	Jul 21, 2023	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Organochlorine Pesticides	Sydney	Jul 21, 2023	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Polychlorinated Biphenyls	Sydney	Jul 21, 2023	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Total Recoverable Hydrocarbons	Sydney	Jul 21, 2023	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
% Moisture	Sydney	Jul 20, 2023	14 Days
- Method: LTM-GEN-7080 Moisture			
% Clay	Brisbane	Jul 24, 2023	14 Days
- Method: LTM-GEN-7040			
pH (1:5 Aqueous extract at 25 °C as rec.)	Sydney	Jul 21, 2023	7 Days
- Method: LTM-GEN-7090 pH by ISE			
Conductivity (1:5 aqueous extract at 25 °C as rec.)	Sydney	Jul 21, 2023	7 Days
- Method: LTM-INO-4030 Conductivity			
Cation Exchange Capacity	Melbourne	Jul 25, 2023	28 Days
- Method: LTM-MET-3060 Cation Exchange Capacity by bases & Exchangeable Sodium Percentage			

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Company Name: Sydney Environmental Group Pty Ltd
Address: Unit 63/45 Huntley St
Alexandria
NSW 2015

Project Name: WARRIEWOOD DSI
Project ID: 2148

Order No.:
Report #: 1009382
Phone: 1300 884 164
Fax:

Received: Jul 19, 2023 7:15 PM
Due: Jul 24, 2023
Priority: 3 Day
Contact Name: Mitchell Kirby

Eurofins Analytical Services Manager : Asim Khan

Sample Detail						% Clay	HOLD	pH (1:5 Aqueous extract at 25 °C as rec.)	Polycyclic Aromatic Hydrocarbons	Metals M8	Moisture Set	Cation Exchange Capacity	BTEXN and Volatile TRH	BTEXN and Volatile TRH	Contam Suite 1 (TRH/BTEX/PAH/Metals/ Asbestos)	Contam Suite 2 (TRH/BTEX/PAH/Metals/OCP/PCB/Asbestos
Melbourne Laboratory - NATA # 1261 Site # 1254												X				
Sydney Laboratory - NATA # 1261 Site # 18217							X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794						X										
External Laboratory																
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**											
1	TP01_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041444						X				X	
2	TP02_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041445						X					X
3	TP03_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041446						X				X	
4	TP04_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041447						X					X
5	TP05_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041448						X				X	
6	TP06_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041449						X					X
7	TP07_1.1_1.2	Jul 19, 2023		Soil	S23-Jl0041450						X				X	
8	TP08_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041451						X					X
9	TP09_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041452						X				X	
10	TP10_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041453						X					X
11	TP11_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041454						X				X	

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Melbourne Laboratory - NATA # 1261 Site # 1254												X				
Sydney Laboratory - NATA # 1261 Site # 18217							X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794						X										
12	TP12_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041455						X					X
13	TP13_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041456						X				X	
14	TP14_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041457						X					X
15	TP15_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041458						X				X	
16	TP16_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041459						X					X
17	TP17_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041460						X				X	
18	TP18_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041461						X					X
19	TP19_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041462						X				X	
20	TP20_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041463						X					X
21	TP21_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041464						X				X	
22	TP22_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041465						X					X
23	TP23_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041466						X				X	
24	DUP01	Jul 19, 2023		Soil	S23-Jl0041467				X	X	X					
25	DUP02	Jul 19, 2023		Soil	S23-Jl0041468				X	X	X					

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Melbourne Laboratory - NATA # 1261 Site # 1254												X				
Sydney Laboratory - NATA # 1261 Site # 18217							X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794						X										
26	EIL	Jul 19, 2023		Soil	S23-Jl0041469	X		X		X	X	X				
27	TRIP SPIKE	Jul 19, 2023		Trip Spike (solid)	S23-Jl0041470									X		
28	TRIP BLANK	Jul 19, 2023		Trip Blank (solid)	S23-Jl0041471								X			
29	TP01_1.1_1.2	Jul 19, 2023		Soil	S23-Jl0041473		X									
30	TP03_1.1_1.2	Jul 19, 2023		Soil	S23-Jl0041474		X									
31	TP04_0.6_0.7	Jul 19, 2023		Soil	S23-Jl0041475		X									
32	TP06_1.1_1.2	Jul 19, 2023		Soil	S23-Jl0041476		X									
33	TP07_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041477		X									
34	FC-01	Jul 19, 2023		Building Materials	S23-Jl0041478		X									
35	TP08-FC	Jul 19, 2023		Building Materials	S23-Jl0041479		X									
Test Counts						1	7	1	2	3	26	1	1	1	12	11

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Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**µg/L:** micrograms per litre
ppm: parts per million	**ppb:** parts per billion	**%:** Percentage
org/100 mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100 mL:** Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit		

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR: RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total*	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-HCH	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-HCH	mg/kg	< 0.05			0.05	Pass	
d-HCH	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-HCH (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Toxaphene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.1			0.1	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.1			0.1	Pass	
Aroclor-1242	mg/kg	< 0.1			0.1	Pass	
Aroclor-1248	mg/kg	< 0.1			0.1	Pass	
Aroclor-1254	mg/kg	< 0.1			0.1	Pass	
Aroclor-1260	mg/kg	< 0.1			0.1	Pass	
Total PCB*	mg/kg	< 0.1			0.1	Pass	
Method Blank							
Conductivity (1:5 aqueous extract at 25 °C as rec.)	uS/cm	< 10			10	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons							
TRH C6-C9	%	82			70-130	Pass	
TRH C10-C14	%	90			70-130	Pass	
TRH C6-C10	%	81			70-130	Pass	
TRH >C10-C16	%	89			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	103			70-130	Pass	
Toluene	%	96			70-130	Pass	
Ethylbenzene	%	98			70-130	Pass	
m&p-Xylenes	%	97			70-130	Pass	
o-Xylene	%	99			70-130	Pass	
Xylenes - Total*	%	98			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	98			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	82			70-130	Pass	
Acenaphthylene	%	76			70-130	Pass	
Anthracene	%	82			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benz(a)anthracene	%	71			70-130	Pass	
Benzo(a)pyrene	%	80			70-130	Pass	
Benzo(b&j)fluoranthene	%	79			70-130	Pass	
Benzo(g.h.i)perylene	%	77			70-130	Pass	
Benzo(k)fluoranthene	%	91			70-130	Pass	
Chrysene	%	86			70-130	Pass	
Dibenz(a.h)anthracene	%	75			70-130	Pass	
Fluoranthene	%	80			70-130	Pass	
Fluorene	%	76			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	73			70-130	Pass	
Naphthalene	%	82			70-130	Pass	
Phenanthrene	%	70			70-130	Pass	
Pyrene	%	82			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	102			80-120	Pass	
Cadmium	%	105			80-120	Pass	
Chromium	%	105			80-120	Pass	
Copper	%	105			80-120	Pass	
Lead	%	105			80-120	Pass	
Mercury	%	106			80-120	Pass	
Nickel	%	105			80-120	Pass	
Zinc	%	103			80-120	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	83			70-130	Pass	
4.4'-DDD	%	80			70-130	Pass	
4.4'-DDE	%	85			70-130	Pass	
4.4'-DDT	%	89			70-130	Pass	
a-HCH	%	82			70-130	Pass	
Aldrin	%	78			70-130	Pass	
b-HCH	%	81			70-130	Pass	
d-HCH	%	78			70-130	Pass	
Dieldrin	%	79			70-130	Pass	
Endosulfan I	%	87			70-130	Pass	
Endosulfan II	%	75			70-130	Pass	
Endosulfan sulphate	%	84			70-130	Pass	
Endrin	%	83			70-130	Pass	
Endrin aldehyde	%	70			70-130	Pass	
Endrin ketone	%	88			70-130	Pass	
g-HCH (Lindane)	%	83			70-130	Pass	
Heptachlor	%	70			70-130	Pass	
Heptachlor epoxide	%	82			70-130	Pass	
Hexachlorobenzene	%	77			70-130	Pass	
Methoxychlor	%	84			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1016	%	73			70-130	Pass	
Aroclor-1260	%	71			70-130	Pass	
LCS - % Recovery							
Conductivity (1:5 aqueous extract at 25 °C as rec.)	%	94			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons				Result 1					
TRH C6-C9	S23-Jl0045529	NCP	%	115			70-130	Pass	
TRH C10-C14	S23-Jl0032014	NCP	%	100			70-130	Pass	
TRH C6-C10	S23-Jl0045529	NCP	%	110			70-130	Pass	
TRH >C10-C16	S23-Jl0032014	NCP	%	93			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S23-Jl0045529	NCP	%	84			70-130	Pass	
Toluene	S23-Jl0045529	NCP	%	112			70-130	Pass	
Ethylbenzene	S23-Jl0045529	NCP	%	104			70-130	Pass	
m&p-Xylenes	S23-Jl0045529	NCP	%	103			70-130	Pass	
o-Xylene	S23-Jl0045529	NCP	%	105			70-130	Pass	
Xylenes - Total*	S23-Jl0045529	NCP	%	104			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S23-Jl0045529	NCP	%	98			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S23-Jl0041451	CP	%	74			70-130	Pass	
Acenaphthylene	S23-Jl0041451	CP	%	71			70-130	Pass	
Anthracene	S23-Jl0041451	CP	%	71			70-130	Pass	
Benzo(a)pyrene	S23-Jl0041451	CP	%	77			70-130	Pass	
Benzo(b&j)fluoranthene	S23-Jl0041451	CP	%	71			70-130	Pass	
Benzo(g.h.i)perylene	S23-Jl0041451	CP	%	74			70-130	Pass	
Benzo(k)fluoranthene	S23-Jl0041451	CP	%	89			70-130	Pass	
Chrysene	S23-Jl0041451	CP	%	81			70-130	Pass	
Dibenz(a.h)anthracene	S23-Jl0041451	CP	%	70			70-130	Pass	
Fluoranthene	S23-Jl0041451	CP	%	72			70-130	Pass	
Naphthalene	S23-Jl0041451	CP	%	76			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
4.4'-DDD	S23-Jl0041451	CP	%	74			70-130	Pass	
4.4'-DDT	S23-Jl0041451	CP	%	79			70-130	Pass	
Endosulfan I	S23-Jl0041451	CP	%	73			70-130	Pass	
Endosulfan II	S23-Jl0041451	CP	%	74			70-130	Pass	
Endosulfan sulphate	S23-Jl0041451	CP	%	72			70-130	Pass	
Endrin	S23-Jl0041451	CP	%	79			70-130	Pass	
Endrin aldehyde	S23-Jl0041451	CP	%	84			70-130	Pass	
Endrin ketone	S23-Jl0041451	CP	%	84			70-130	Pass	
g-HCH (Lindane)	S23-Jl0041451	CP	%	70			70-130	Pass	
Heptachlor epoxide	S23-Jl0041451	CP	%	83			70-130	Pass	
Methoxychlor	S23-Jl0041451	CP	%	75			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S23-Jl0041465	CP	%	100			75-125	Pass	
Cadmium	S23-Jl0041465	CP	%	99			75-125	Pass	
Chromium	S23-Jl0041465	CP	%	101			75-125	Pass	
Copper	S23-Jl0041465	CP	%	98			75-125	Pass	
Lead	S23-Jl0041465	CP	%	105			75-125	Pass	
Mercury	S23-Jl0041465	CP	%	86			75-125	Pass	
Nickel	S23-Jl0041465	CP	%	98			75-125	Pass	
Zinc	S23-Jl0041465	CP	%	88			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C10-C14	S23-Jl0041449	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S23-Jl0041449	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S23-Jl0041449	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C10-C16	S23-Jl0041449	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S23-Jl0041449	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S23-Jl0041449	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S23-Jl0041449	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S23-Jl0041449	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S23-Jl0041449	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S23-Jl0041449	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S23-Jl0041449	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S23-Jl0041449	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S23-Jl0041449	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S23-Jl0041449	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S23-Jl0041449	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S23-Jl0041449	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S23-Jl0041449	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S23-Jl0041449	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S23-Jl0041449	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S23-Jl0041449	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S23-Jl0041449	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S23-Jl0041449	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S23-Jl0041449	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S23-Jl0041449	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S23-Jl0041449	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S23-Jl0041449	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-HCH	S23-Jl0041449	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S23-Jl0041449	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-HCH	S23-Jl0041449	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-HCH	S23-Jl0041449	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S23-Jl0041449	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S23-Jl0041449	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S23-Jl0041449	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S23-Jl0041449	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S23-Jl0041449	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S23-Jl0041449	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S23-Jl0041449	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-HCH (Lindane)	S23-Jl0041449	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S23-Jl0041449	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S23-Jl0041449	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S23-Jl0041449	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S23-Jl0041449	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toxaphene	S23-Jl0041449	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	S23-Jl0041449	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1221	S23-Jl0041449	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	S23-Jl0041449	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1242	S23-Jl0041449	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1248	S23-Jl0041449	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1254	S23-Jl0041449	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1260	S23-Jl0041449	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Total PCB*	S23-Jl0041449	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	S23-Jl0041453	CP	%	16	15	3.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S23-Jl0041454	CP	mg/kg	5.1	6.6	26	30%	Pass	
Copper	S23-Jl0041454	CP	mg/kg	14	26	59	30%	Fail	Q15
Lead	S23-Jl0041454	CP	mg/kg	25	33	28	30%	Pass	
Mercury	S23-Jl0041454	CP	mg/kg	< 0.1	0.1	72	30%	Fail	Q15
Nickel	S23-Jl0041454	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C6-C9	S23-Jl0041456	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C6-C10	S23-Jl0041456	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S23-Jl0041456	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S23-Jl0041456	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S23-Jl0041456	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S23-Jl0041456	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S23-Jl0041456	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	S23-Jl0041456	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S23-Jl0041456	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	S23-Jl0041463	CP	%	15	15	2.5	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S23-Jl0041464	CP	mg/kg	5.6	6.7	17	30%	Pass	
Cadmium	S23-Jl0041464	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S23-Jl0041464	CP	mg/kg	22	14	43	30%	Fail	Q15
Copper	S23-Jl0041464	CP	mg/kg	15	11	30	30%	Pass	
Lead	S23-Jl0041464	CP	mg/kg	33	26	21	30%	Pass	
Mercury	S23-Jl0041464	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S23-Jl0041464	CP	mg/kg	8.7	7.7	12	30%	Pass	
Zinc	S23-Jl0041464	CP	mg/kg	49	25	64	30%	Fail	Q15
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S23-Jl0041466	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S23-Jl0041466	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S23-Jl0041466	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S23-Jl0041466	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S23-Jl0041466	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S23-Jl0041466	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Benzo(g.h.i)perylene	S23-Jl0041466	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S23-Jl0041466	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S23-Jl0041466	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S23-Jl0041466	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S23-Jl0041466	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S23-Jl0041466	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S23-Jl0041466	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S23-Jl0041466	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S23-Jl0041466	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S23-Jl0041466	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S23-Jl0041466	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S23-Jl0041466	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S23-Jl0041466	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S23-Jl0041466	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-HCH	S23-Jl0041466	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S23-Jl0041466	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-HCH	S23-Jl0041466	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-HCH	S23-Jl0041466	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S23-Jl0041466	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S23-Jl0041466	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S23-Jl0041466	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S23-Jl0041466	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S23-Jl0041466	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S23-Jl0041466	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S23-Jl0041466	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-HCH (Lindane)	S23-Jl0041466	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S23-Jl0041466	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S23-Jl0041466	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S23-Jl0041466	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S23-Jl0041466	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toxaphene	S23-Jl0041466	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	S23-Jl0041466	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1221	S23-Jl0041466	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	S23-Jl0041466	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1242	S23-Jl0041466	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1248	S23-Jl0041466	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1254	S23-Jl0041466	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1260	S23-Jl0041466	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Total PCB*	S23-Jl0041466	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	S23-Jl0041469	CP	%	17	16	1.9	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25 °C as rec.)	S23-Jl0045937	NCP	uS/cm	260	300	13	30%	Pass	
pH (1:5 Aqueous extract at 25 °C as rec.)	S23-Jl0045937	NCP	pH Units	11	11	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised by:

Asim Khan	Analytical Services Manager
Caitlin Breeze	Senior Analyst-Metal
Fang Yee Tan	Senior Analyst-Metal
Jonathon Angell	Senior Analyst-Inorganic
Mickael Ros	Senior Analyst-Metal
Roopesh Rangarajan	Senior Analyst-Organic
Roopesh Rangarajan	Senior Analyst-Volatile
Ryan Phillips	Senior Analyst-Inorganic
Sayeed Abu	Senior Analyst-Asbestos

Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

CERTIFICATE OF ANALYSIS

Work Order	: **ES2324402**	Page	: 1 of 5
Client	: **SYDNEY ENVIRONMENTAL GROUP PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: ENVIRO	Contact	: Customer Services ES
Address	: Unit 63/45 Huntley Street, Alexandria 2014	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 2148 Warriewood DSI	Date Samples Received	: 21-Jul-2023 13:30
Order number	: ----	Date Analysis Commenced	: 23-Jul-2023
C-O-C number	: ----	Issue Date	: 26-Jul-2023 11:29
Sampler	: MK		
Site	: ----		
Quote number	: SY/412/22		
No. of samples received	: 2		
No. of samples analysed	: 2		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Evie Sidarta	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	Dup01a	Dup02a	----	----	----
			Sampling date / time	19-Jul-2023 00:00	19-Jul-2023 00:00	----	----	----
Compound	CAS Number	LOR	Unit	ES2324402-001	ES2324402-002	--------	--------	--------
				Result	Result	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**20.2**	**12.1**	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**6**	<5	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	----	----
Chromium	7440-47-3	2	mg/kg	**28**	**5**	----	----	----
Copper	7440-50-8	5	mg/kg	**6**	<5	----	----	----
Lead	7439-92-1	5	mg/kg	**30**	**9**	----	----	----
Nickel	7440-02-0	2	mg/kg	**2**	<2	----	----	----
Zinc	7440-66-6	5	mg/kg	**36**	**6**	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	----	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	**0.6**	**0.6**	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	**1.2**	**1.2**	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	**112**	**86.8**	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	Dup01a	Dup02a	----	----	----
				Sampling date / time	19-Jul-2023 00:00	19-Jul-2023 00:00	----	----	----
Compound	CAS Number	LOR	Unit		ES2324402-001	ES2324402-002	--------	--------	--------
					Result	Result	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates - Continued									
2-Chlorophenol-D4	93951-73-6	0.5	%		**86.9**	**89.3**	**----**	**----**	**----**
2.4.6-Tribromophenol	118-79-6	0.5	%		**84.6**	**93.2**	**----**	**----**	**----**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**92.8**	**51.5**	**----**	**----**	**----**
Anthracene-d10	1719-06-8	0.5	%		**90.8**	**87.7**	**----**	**----**	**----**
4-Terphenyl-d14	1718-51-0	0.5	%		**68.4**	**91.7**	**----**	**----**	**----**

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129

Certificate of Analysis

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NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025–Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Sydney Environmental Group Pty Ltd
Unit 63/45 Huntley St
Alexandria
NSW 2015

Attention:	Mitchell Kirby
Report	1009382-AID
Project Name	WARRIEWOOD DSI
Project ID	2148
Received Date	Jul 19, 2023
Date Reported	Jul 26, 2023

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed. *NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.*
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w). The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk). *NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos".This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.*

Project Name WARRIEWOOD DSI
Project ID 2148
Date Sampled Jul 19, 2023
Report 1009382-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
TP01_0.2_0.3	23-Jl0041444	Jul 19, 2023	Approximate Sample 101g Sample consisted of: Brown coarse-grained sandy soil, sand stone, glass and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP02_0.2_0.3	23-Jl0041445	Jul 19, 2023	Approximate Sample 47g Sample consisted of: Brown fine-grained clayey soil, organic debris and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP03_0.2_0.3	23-Jl0041446	Jul 19, 2023	Approximate Sample 62g Sample consisted of: Brown fine-grained clayey soil, glass, plastic, organic debris and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP04_0.2_0.3	23-Jl0041447	Jul 19, 2023	Approximate Sample 64g Sample consisted of: Brown fine-grained clayey soil, cement and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP05_0.2_0.3	23-Jl0041448	Jul 19, 2023	Approximate Sample 60g Sample consisted of: Brown fine-grained clayey soil, organic debris and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP06_0.2_0.3	23-Jl0041449	Jul 19, 2023	Approximate Sample 76g Sample consisted of: Brown fine-grained clayey soil, organic debris and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP07_1.1_1.2	23-Jl0041450	Jul 19, 2023	Approximate Sample 72g Sample consisted of: Brown fine-grained clayey soil, organic debris, brick, cement and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP08_0.2_0.3	23-Jl0041451	Jul 19, 2023	Approximate Sample 37g Sample consisted of: Brown fine-grained clayey soil, organic debris and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
TP09_0.2_0.3	23-Jl0041452	Jul 19, 2023	Approximate Sample 36g Sample consisted of: Brown fine-grained clayey soil, organic debris, cement and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP10_0.2_0.3	23-Jl0041453	Jul 19, 2023	Approximate Sample 55g Sample consisted of: Brown fine-grained clayey soil, organic debris and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP11_0.2_0.3	23-Jl0041454	Jul 19, 2023	Approximate Sample 87g Sample consisted of: Brown fine-grained clayey soil, organic debris and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP12_0.2_0.3	23-Jl0041455	Jul 19, 2023	Approximate Sample 127g Sample consisted of: Brown fine-grained clayey soil, organic debris and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP13_0.2_0.3	23-Jl0041456	Jul 19, 2023	Approximate Sample 67g Sample consisted of: Brown fine-grained clayey soil, organic debris and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP14_0.2_0.3	23-Jl0041457	Jul 19, 2023	Approximate Sample 110g Sample consisted of: Brown fine-grained clayey soil, organic debris and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP15_0.2_0.3	23-Jl0041458	Jul 19, 2023	Approximate Sample 75g Sample consisted of: Brown coarse-grained sandy soil, organic debris and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP16_0.2_0.3	23-Jl0041459	Jul 19, 2023	Approximate Sample 102g Sample consisted of: Brown coarse-grained sandy soil, organic debris and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP17_0.2_0.3	23-Jl0041460	Jul 19, 2023	Approximate Sample 68g Sample consisted of: Brown coarse-grained sandy soil, organic debris and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP18_0.2_0.3	23-Jl0041461	Jul 19, 2023	Approximate Sample 53g Sample consisted of: Brown coarse-grained sandy soil, organic debris and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP19_0.2_0.3	23-Jl0041462	Jul 19, 2023	Approximate Sample 29g Sample consisted of: Brown coarse-grained sandy soil, organic debris and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP20_0.2_0.3	23-Jl0041463	Jul 19, 2023	Approximate Sample 46g Sample consisted of: Brown coarse-grained sandy soil, organic debris and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP21_0.2_0.3	23-Jl0041464	Jul 19, 2023	Approximate Sample 83g Sample consisted of: Brown coarse-grained sandy soil, organic debris and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
TP22_0.2_0.3	23-Jl0041465	Jul 19, 2023	Approximate Sample 87g Sample consisted of: Brown coarse-grained sandy soil, organic debris, cement and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP23_0.2_0.3	23-Jl0041466	Jul 19, 2023	Approximate Sample 41g Sample consisted of: Brown coarse-grained sandy soil, organic debris, bitumen and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Jul 20, 2023	Indefinite

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Company Name: Sydney Environmental Group Pty Ltd
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NSW 2015

Project Name: WARRIEWOOD DSI
Project ID: 2148

Order No.:
Report #: 1009382
Phone: 1300 884 164
Fax:

Received: Jul 19, 2023 7:15 PM
Due: Jul 24, 2023
Priority: 3 Day
Contact Name: Mitchell Kirby

Eurofins Analytical Services Manager : Asim Khan

Sample Detail						% Clay	HOLD	pH (1:5 Aqueous extract at 25 °C as rec.)	Polycyclic Aromatic Hydrocarbons	Metals M8	Moisture Set	Cation Exchange Capacity	BTEXN and Volatile TRH	BTEXN and Volatile TRH	Contam Suite 1 (TRH/BTEX/PAH/Metals/ Asbestos)	Contam Suite 2 (TRH/BTEX/PAH/Metals/OCP/PCB/Asbestos
Melbourne Laboratory - NATA # 1261 Site # 1254												X				
Sydney Laboratory - NATA # 1261 Site # 18217							X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794						X										
External Laboratory																
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**											
1	TP01_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041444						X				X	
2	TP02_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041445						X					X
3	TP03_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041446						X				X	
4	TP04_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041447						X					X
5	TP05_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041448						X				X	
6	TP06_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041449						X					X
7	TP07_1.1_1.2	Jul 19, 2023		Soil	S23-Jl0041450						X				X	
8	TP08_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041451						X					X
9	TP09_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041452						X				X	
10	TP10_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041453						X					X
11	TP11_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041454						X				X	

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Melbourne Laboratory - NATA # 1261 Site # 1254												X				
Sydney Laboratory - NATA # 1261 Site # 18217							X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794						X										
12	TP12_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041455						X					X
13	TP13_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041456						X				X	
14	TP14_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041457						X					X
15	TP15_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041458						X				X	
16	TP16_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041459						X					X
17	TP17_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041460						X				X	
18	TP18_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041461						X					X
19	TP19_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041462						X				X	
20	TP20_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041463						X					X
21	TP21_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041464						X				X	
22	TP22_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041465						X					X
23	TP23_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041466						X				X	
24	DUP01	Jul 19, 2023		Soil	S23-Jl0041467				X	X	X					
25	DUP02	Jul 19, 2023		Soil	S23-Jl0041468				X	X	X					

eurofins

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email: EnviroSales@eurofins.com

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ABN: 50 005 085 521

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Christchurch 7675
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IANZ# 1290

Company Name: Sydney Environmental Group Pty Ltd
Address: Unit 63/45 Huntley St
Alexandria
NSW 2015

Project Name: WARRIEWOOD DSI
Project ID: 2148

Order No.:
Report #: 1009382
Phone: 1300 884 164
Fax:

Received: Jul 19, 2023 7:15 PM
Due: Jul 24, 2023
Priority: 3 Day
Contact Name: Mitchell Kirby

Eurofins Analytical Services Manager : Asim Khan

Sample Detail						% Clay	HOLD	pH (1:5 Aqueous extract at 25 °C as rec.)	Polycyclic Aromatic Hydrocarbons	Metals M8	Moisture Set	Cation Exchange Capacity	BTEXN and Volatile TRH	BTEXN and Volatile TRH	Contam Suite 1 (TRH/BTEX/PAH/Metals/ Asbestos)	Contam Suite 2 (TRH/BTEX/PAH/Metals/OCP/PCB/Asbestos
Melbourne Laboratory - NATA # 1261 Site # 1254												X				
Sydney Laboratory - NATA # 1261 Site # 18217							X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794						X										
26	EIL	Jul 19, 2023		Soil	S23-Jl0041469	X		X		X	X	X				
27	TRIP SPIKE	Jul 19, 2023		Trip Spike (solid)	S23-Jl0041470									X		
28	TRIP BLANK	Jul 19, 2023		Trip Blank (solid)	S23-Jl0041471								X			
29	TP01_1.1_1.2	Jul 19, 2023		Soil	S23-Jl0041473		X									
30	TP03_1.1_1.2	Jul 19, 2023		Soil	S23-Jl0041474		X									
31	TP04_0.6_0.7	Jul 19, 2023		Soil	S23-Jl0041475		X									
32	TP06_1.1_1.2	Jul 19, 2023		Soil	S23-Jl0041476		X									
33	TP07_0.2_0.3	Jul 19, 2023		Soil	S23-Jl0041477		X									
34	FC-01	Jul 19, 2023		Building Materials	S23-Jl0041478		X									
35	TP08-FC	Jul 19, 2023		Building Materials	S23-Jl0041479		X									
Test Counts						1	7	1	2	3	26	1	1	1	12	11

Internal Quality Control Review and Glossary General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with the colour **blue** indicates data provided by customer that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

Please refer to the most recent version of the 'Sample Preservation and Container Guide' for holding times (QS3001).
If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported. Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w:	Percentage weight-for-weight basis, e.g. of asbestos in asbestos-containing finds in soil samples (**% w/w**)
F/fld	Airborne fibre filter loading as Fibres (**N**) per Fields counted (**n**)
F/mL	Airborne fibre reported concentration as Fibres per millilitre of air drawn over the sampler membrane (**C**)
g, kg	Mass, e.g. of whole sample (**M**) or asbestos-containing find within the sample (**m**)
g/kg	Concentration in grams per kilogram
L, mL	Volume, e.g. of air as measured in AFM (**V** = **r** x **t**)
L/min	Airborne fibre sampling Flowrate as litres per minute of air drawn over the sampler membrane (**r**)
min	Time (**t**), e.g. of air sample collection period

Calculations

Airborne Fibre Concentration: $C = \left(\frac{A}{a}\right) \times \left(\frac{N}{n}\right) \times \left(\frac{1}{r}\right) \times \left(\frac{1}{t}\right) = K \times \left(\frac{N}{n}\right) \times \left(\frac{1}{V}\right)$

Asbestos Content (as asbestos): $\%\, w/w = \frac{(m \times P_A)}{M}$

Weighted Average (of asbestos): $\%_{WA} = \sum \frac{(m \times P_A)_x}{x}$

Terms

%asbestos	Estimated percentage of asbestos in a given matrix. May be derived from knowledge or experience of the material, informed by HSG264 *Appendix 2*, else assumed to be 15% in accordance with WA DOH *Appendix 2* (**P_A**).
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded (non-friable) condition. For the purposes of the NEPM and WA DOH, ACM corresponds to material larger than 7 mm x 7 mm.
AF	Asbestos Fines. Asbestos contamination within a soil sample, as defined by WA DOH. Includes loose fibre bundles and small pieces of friable and non-friable material such as asbestos cement fragments mixed with soil. Considered under the NEPM as equivalent to “non-bonded / friable”.
AFM	Airborne Fibre Monitoring, e.g. by the MFM.
Amosite	Amosite Asbestos Detected. Amosite may also refer to Fibrous Grunerite or Brown Asbestos. Identified in accordance with AS 4964-2004.
AS	Australian Standard.
Asbestos Content (as asbestos)	Total % w/w asbestos content in asbestos-containing finds in a soil sample (**% w/w)**.
Chrysotile	Chrysotile Asbestos Detected. Chrysotile may also refer to Fibrous Serpentine or White Asbestos. Identified in accordance with AS 4964-2004.
COC	Chain of Custody.
Crocidolite	Crocidolite Asbestos Detected. Crocidolite may also refer to Fibrous Riebeckite or Blue Asbestos. Identified in accordance with AS 4964-2004.
Dry	Sample is dried by heating prior to analysis.
DS	Dispersion Staining. Technique required for Unequivocal Identification of asbestos fibres by PLM.
FA	Fibrous Asbestos. Asbestos containing material that is wholly or in part friable, including materials with higher asbestos content with a propensity to become friable with handling, and any material that was previously non-friable and in a severely degraded condition. For the purposes of the NEPM and WA DOH, FA generally corresponds to material larger than 7 mm x 7 mm, although FA may be more difficult to visibly distinguish and may be assessed as AF.
Fibre Count	Total of all fibres (whether asbestos or not) meeting the counting criteria set out in the NOHSC:3003
Fibre ID	Fibre Identification. Unequivocal identification of asbestos fibres according to AS 4964-2004. Includes Chrysotile, Amosite (Grunerite) or Crocidolite asbestos.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory’s remit to assess degree of friability.
HSG248	UK HSE HSG248, *Asbestos: The Analysts Guide*, 2nd Edition (2021).
HSG264	UK HSE HSG264, *Asbestos: The Survey Guide* (2012).
ISO (also ISO/IEC)	International Organization for Standardization / International Electrotechnical Commission.
K Factor	Microscope constant (**K**) as derived from the effective filter area of the given AFM membrane used for collecting the sample (**A**) and the projected eyepiece graticule area of the specific microscope used for the analysis (**a**).
LOR	Limit of Reporting.
MFM (also NOHSC:3003)	Membrane Filter Method. As described by the Australian Government National Occupational Health and Safety Commission, *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres*, 2nd Edition [NOHSC:3003(2005)].
NEPM (also ASC NEPM)	National Environment Protection (Assessment of Site Contamination) Measure, (2013, as amended).
Organic	Organic Fibres Detected. Organic may refer to Natural or Man-Made Polymeric Fibres. Identified in accordance with AS 4964-2004.
PCM	Phase Contrast Microscopy. As used for Fibre Counting according to the MFM.
PLM	Polarised Light Microscopy. As used for Fibre Identification and Trace Analysis according to AS 4964-2004.
Sampling	Unless otherwise stated Eurofins are not responsible for sampling equipment or the sampling process.
SMF	Synthetic Mineral Fibre Detected. SMF may also refer to Man Made Vitreous Fibres. Identified in accordance with AS 4964-2004.
SRA	Sample Receipt Advice.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres (particularly asbestos) in a given sample matrix.
UK HSE HSG	United Kingdom, Health and Safety Executive, Health and Safety Guidance, publication.
UMF	Unidentified Mineral Fibre Detected. Fibrous minerals that are detected but have not been unequivocally identified by PLM with DS according the AS 4964-2004. May include (but not limited to) Actinolite, Anthophyllite or Tremolite asbestos.
WA DOH	Reference document for the NEPM. Government of Western Australia, *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia* (updated 2021), including Appendix Four: *Laboratory analysis*
Weighted Average	Combined average % w/w asbestos content of all asbestos-containing finds in the given aliquot or total soil sample (**$\%_{WA}$**).

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Asbestos Counter/Identifier:

Bennel Jiri	Senior Analyst-Asbestos

Authorised by:

Sayeed Abu	Senior Analyst-Asbestos

Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Certificate of Analysis

eurofins | Environment Testing

Sydney Environmental Group Pty Ltd
Unit 63/45 Huntley St
Alexandria
NSW 2015

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025–Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention:	Mitchell Kirby
Report	1010813-AID
Project Name	ADDITIONAL: WARRIEWOOD DSI
Project ID	ADDITIONAL: 2148
Received Date	Jul 25, 2023
Date Reported	Jul 26, 2023

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed. *NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.*
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w). The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk). *NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos".This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.*

Project Name ADDITIONAL: WARRIEWOOD DSI
Project ID ADDITIONAL: 2148
Date Sampled Jul 19, 2023
Report 1010813-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
FC01	23-Jl0054650	Jul 19, 2023	Approximate Sample 10g / 40x35x3mm Sample consisted of: Grey fibre cement material	Chrysotile and amosite asbestos detected.
TP08-FC	23-Jl0054651	Jul 19, 2023	Approximate Sample 45g / 60x55x5mm Sample consisted of: Grey fibre cement material	Chrysotile and amosite asbestos detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Jul 25, 2023	Indefinite

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Eurofins Environment Testing Australia Pty Ltd
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Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West NSW 2304
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	Tel: +61 2 4968 8448
Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261 Site# 1254	NATA# 1261 Site# 25403	NATA# 1261 Site# 18217	NATA# 1261 Site# 25466	NATA# 1261 Site# 20794	Site# 25079 & 25289

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IANZ# 1327	IANZ# 1290

Company Name: Sydney Environmental Group Pty Ltd
Address: Unit 63/45 Huntley St
Alexandria
NSW 2015

Project Name: ADDITIONAL: WARRIEWOOD DSI
Project ID: ADDITIONAL: 2148

Order No.:
Report #: 1010813
Phone: 1300 884 164
Fax:

Received: Jul 25, 2023 3:31 PM
Due: Jul 26, 2023
Priority: 1 Day
Contact Name: Mitchell Kirby

Eurofins Analytical Services Manager : Asim Khan

Sample Detail						Asbestos Absence /Presence
Sydney Laboratory - NATA # 1261 Site # 18217						X
External Laboratory						
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**	
1	FC01	Jul 19, 2023		Building Materials	S23-Jl0054650	X
2	TP08-FC	Jul 19, 2023		Building Materials	S23-Jl0054651	X
Test Counts						2

Internal Quality Control Review and Glossary General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with the colour **blue** indicates data provided by customer that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

Please refer to the most recent version of the 'Sample Preservation and Container Guide' for holding times (QS3001).
If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported. Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w:	Percentage weight-for-weight basis, e.g. of asbestos in asbestos-containing finds in soil samples (**% w/w**)
F/fld	Airborne fibre filter loading as Fibres (**N**) per Fields counted (**n**)
F/mL	Airborne fibre reported concentration as Fibres per millilitre of air drawn over the sampler membrane (**C**)
g, kg	Mass, e.g. of whole sample (**M**) or asbestos-containing find within the sample (**m**)
g/kg	Concentration in grams per kilogram
L, mL	Volume, e.g. of air as measured in AFM (**V** = **r** x **t**)
L/min	Airborne fibre sampling Flowrate as litres per minute of air drawn over the sampler membrane (**r**)
min	Time (**t**), e.g. of air sample collection period

Calculations

Airborne Fibre Concentration: $C = \left(\frac{A}{a}\right) \times \left(\frac{N}{n}\right) \times \left(\frac{1}{r}\right) \times \left(\frac{1}{t}\right) = K \times \left(\frac{N}{n}\right) \times \left(\frac{1}{V}\right)$

Asbestos Content (as asbestos): $\%\, w/w = \frac{(m \times P_A)}{M}$

Weighted Average (of asbestos): $\%_{WA} = \sum \frac{(m \times P_A)_x}{x}$

Terms

%asbestos	Estimated percentage of asbestos in a given matrix. May be derived from knowledge or experience of the material, informed by HSG264 *Appendix 2*, else assumed to be 15% in accordance with WA DOH *Appendix 2* (**P_A**).
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded (non-friable) condition. For the purposes of the NEPM and WA DOH, ACM corresponds to material larger than 7 mm x 7 mm.
AF	Asbestos Fines. Asbestos contamination within a soil sample, as defined by WA DOH. Includes loose fibre bundles and small pieces of friable and non-friable material such as asbestos cement fragments mixed with soil. Considered under the NEPM as equivalent to “non-bonded / friable”.
AFM	Airborne Fibre Monitoring, e.g. by the MFM.
Amosite	Amosite Asbestos Detected. Amosite may also refer to Fibrous Grunerite or Brown Asbestos. Identified in accordance with AS 4964-2004.
AS	Australian Standard.
Asbestos Content (as asbestos)	Total % w/w asbestos content in asbestos-containing finds in a soil sample (**% w/w)**.
Chrysotile	Chrysotile Asbestos Detected. Chrysotile may also refer to Fibrous Serpentine or White Asbestos. Identified in accordance with AS 4964-2004.
COC	Chain of Custody.
Crocidolite	Crocidolite Asbestos Detected. Crocidolite may also refer to Fibrous Riebeckite or Blue Asbestos. Identified in accordance with AS 4964-2004.
Dry	Sample is dried by heating prior to analysis.
DS	Dispersion Staining. Technique required for Unequivocal Identification of asbestos fibres by PLM.
FA	Fibrous Asbestos. Asbestos containing material that is wholly or in part friable, including materials with higher asbestos content with a propensity to become friable with handling, and any material that was previously non-friable and in a severely degraded condition. For the purposes of the NEPM and WA DOH, FA generally corresponds to material larger than 7 mm x 7 mm, although FA may be more difficult to visibly distinguish and may be assessed as AF.
Fibre Count	Total of all fibres (whether asbestos or not) meeting the counting criteria set out in the NOHSC:3003
Fibre ID	Fibre Identification. Unequivocal identification of asbestos fibres according to AS 4964-2004. Includes Chrysotile, Amosite (Grunerite) or Crocidolite asbestos.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory’s remit to assess degree of friability.
HSG248	UK HSE HSG248, *Asbestos: The Analysts Guide*, 2nd Edition (2021).
HSG264	UK HSE HSG264, *Asbestos: The Survey Guide* (2012).
ISO (also ISO/IEC)	International Organization for Standardization / International Electrotechnical Commission.
K Factor	Microscope constant (**K**) as derived from the effective filter area of the given AFM membrane used for collecting the sample (**A**) and the projected eyepiece graticule area of the specific microscope used for the analysis (**a**).
LOR	Limit of Reporting.
MFM (also NOHSC:3003)	Membrane Filter Method. As described by the Australian Government National Occupational Health and Safety Commission, *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres*, 2nd Edition [NOHSC:3003(2005)].
NEPM (also ASC NEPM)	National Environment Protection (Assessment of Site Contamination) Measure, (2013, as amended).
Organic	Organic Fibres Detected. Organic may refer to Natural or Man-Made Polymeric Fibres. Identified in accordance with AS 4964-2004.
PCM	Phase Contrast Microscopy. As used for Fibre Counting according to the MFM.
PLM	Polarised Light Microscopy. As used for Fibre Identification and Trace Analysis according to AS 4964-2004.
Sampling	Unless otherwise stated Eurofins are not responsible for sampling equipment or the sampling process.
SMF	Synthetic Mineral Fibre Detected. SMF may also refer to Man Made Vitreous Fibres. Identified in accordance with AS 4964-2004.
SRA	Sample Receipt Advice.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres (particularly asbestos) in a given sample matrix.
UK HSE HSG	United Kingdom, Health and Safety Executive, Health and Safety Guidance, publication.
UMF	Unidentified Mineral Fibre Detected. Fibrous minerals that are detected but have not been unequivocally identified by PLM with DS according the AS 4964-2004. May include (but not limited to) Actinolite, Anthophyllite or Tremolite asbestos.
WA DOH	Reference document for the NEPM. Government of Western Australia, *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia* (updated 2021), including Appendix Four: *Laboratory analysis*
Weighted Average	Combined average % w/w asbestos content of all asbestos-containing finds in the given aliquot or total soil sample (**$\%_{WA}$**).

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Asbestos Counter/Identifier:

Bennel Jiri	Senior Analyst-Asbestos

Authorised by:

Sayeed Abu	Senior Analyst-Asbestos

Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

RECORD
ABN 50 005 085 521

☒ **Sydney Laboratory**
Unit F3 Bld.F, 16 Mars Rd, Lane Cove West, NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

☐ **Brisbane Laboratory**
Unit 1, 21 Smallwood Pl., Murarrie, QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

☐

☐ **Melbourne Laboratory**
2 Kingston Town Close, Oakleigh, VIC 3166
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Sydney Environmental Group	Project №	2148	Project Manager	PB
Address	U63, 45 Huntley Street Alexandria NSW	Project Name	Narriewood DSI	EDD Format (ESdat, EQuIS, Custom)	
Contact Name				Sampler(s)	MK.
Phone №	1300 884 164			Handed over by	
Special Directions				Primary Email	enviro@sydneyenvironmental.com.au
Purchase Order				Secondary Email	Mitchell@ " "
Quote ID №					

Turnaround Time (TAT) Requirements: ☐ Overnight ☐ Same Day ☐ 1 Day ☐ 2 Day ☑ 3 Day ☐ 5 Day ☐ Other (

№	Client Sample ID	Sampled Date (dd/mm/yy)	Matrix (Solid (S) Water (W))	SEG Contam Suite 1 (TRH, BTEX, PAH, Metals, Asbestos ID)	SEG Contam Suite 2 (TRH, BTEX, PAH, Metals, OCP, PCB, Asbestos ID)	SEG Contam Suite 3 (TRH, BTEX, PAH, Metals, OCP, OPP, PCB, Asbestos ID)	SEG ENM Suite 1 (TRH, BTEX, PAH, Metals, pH, EC, Asbestos ID)	Salinity Assessment Suite (L2 Aggresivity Suite, ESP %)	Asbestos ID AS4964 (0.01%)	Asbestos ID NEPM & WA (0.001%)	B7 Suite (TRH, BTEX, PAH, Metals)	B13 Suite (OCP, PCB)	hold.				1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	TP01-0.2-0.3	19.7.23	S	X																					
2	TP01-1.1-1.2				X								X												
3	TP02-0.2-0.3				X																				
4	TP03-0.2-0.3			X																					
5	TP03-1.1-1.2																								
6	TP04-0.2-0.3				X																				
7	TP04-0.6-0.7												X												
8	TP05-0.2-0.3			X																					
9	TP06-0.2-0.3				X																				
10	TP06-1.1-1.2												X												
11	TP07-0.2-0.3			X									X												
12	TP07-1.1-1.2			X																					
13	TP08-0.2-0.3				X																				
14	TP09-0.2-0.3			X																					
15	TP10-0.2-0.3				X																				
16	TP11-0.2-0.3			X																					
17	TP12-0.2-0.3				X																				
18	TP13-0.2-0.3			X																					
19	TP14-0.2-0.3				X																				
20	TP15-0.2-0.3			X																					
	Total Counts																								

Method of Shipment	☐ Courier (#) ☐ Hand Delivered ☐ Postal	Name	Mitchell Kiely	Signature	[signature]	Date	19.7.23	Time
Eurofins | mgt Laboratory Use Only	Received By: [signature]	SYD | BNE | MEL | PER | ADL |	Signature	[signature]	Date 19/7	Time 7:15	Temperature	5.4
	Received By	SYD | BNE | MEL | PER | ADL |	Signature		Date	Time :	Report №	chilled

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

Eurofins Environment Testing Australia Pty Ltd trading as Eurofins | mgt

Note: Metals = As, Cd, Cr, Cu, Hg, Ni, Pb, and Zn), TRH = Total Recoverable Hydrocarbons, PAH = Polycyclic Aromatic Hydrocarbons, PCB = Polychlorinated Biphenyls, BTEX = Benzene, Toluene, Ethylbenzene, and Xylene

1009382

RECORD

☒ **Sydney Laboratory**
Unit F3 Bld.F, 16 Mars Rd, Lane Cove West, NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

☐ **Brisbane Laboratory**
Unit 1, 21 Smallwood Pl., Murarrie, QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

☐

☐ **Melbourne Laboratory**
2 Kingston Town Close, Oakleigh, VIC 3166
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Sydney Environmental Group	Project №		Project Manager		Sampler(s)	
Address	U63, 45 Huntley Street Alexandria NSW	Project Name		EDD Format (ESdat, EQuIS, Custom)		Handed over by	
						Primary Email	enviro@sydneyenvironmental.com.au
Contact Name						Secondary Email	
Phone №	1300 884 164						
Special Directions							
Purchase Order							
Quote ID №							

Turnaround Time (TAT) Requirements: ☐ Overnight ☐ Same Day ☐ 1 Day ☐ 2 Day ☐ 3 Day ☐ 5 Day ☐ Other (

№	Client Sample ID	Sampled Date (dd/mm/yy)	Matrix (Solid (S) Water (W))	SEG Contam Suite 1 (TRH, BTEX, PAH, Metals, Asbestos ID)	SEG Contam Suite 2 (TRH, BTEX, PAH, Metals, OCP, PCB, Asbestos ID)	SEG Contam Suite 3 (TRH, BTEX, PAH, Metals, OCP, OPP, PCB, Asbestos ID)	SEG ENM Suite 1 (TRH, BTEX, PAH, Metals, pH, EC, Asbestos ID)	Salinity Assessment Suite (L2 Aggresivity Suite, ESP %)	Asbestos ID AS4964 (0.01%)	Asbestos ID NEPM & WA (0.001%)	B7 Suite (TRH, BTEX, PAH, Metals)	B13 Suite (OCP, PCB)	Metals + PAH	CEC + pH + Clay % + Metals	BTEX		1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guideline)	Sample Comments / Dangerous Goods Hazard Warning
1	TP16-0.2-0.3	19.7.21	S		X																				
2				X																					
3					X																				
4				X																					
5					X																				
6				✓																					
7					X																				
8	TP23-0.2-0.3			X																					
9	TPFC-01		BM																						
10	TP08-FC																								
11	Dup01		S										X												
12	Dup01a												X												FWD ALS
13	Dup02												X												
14	Dup02a												X												FWD to ALS
15	EIL													X											
16	Trip Spike														X										
17	Trip Blank														X										
18																									
19																									
20																									
	Total Counts																								

Method of Shipment	☐ Courier (#) ☐ Hand Delivered ☐ Postal	Name		Signature		Date	Time
Eurofins | mgt Laboratory Use Only	Received By: 879	SYD | BNE | MEL | PER | ADL |	Signature: [signature]	Date: 19/7	Time: 7:15	Temperature: 5.4	
	Received By	SYD | BNE | MEL | PER | ADL |	Signature	Date	Time	Report №	

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

Eurofins Environment Testing Australia Pty Ltd trading as Eurofins | mgt

Note: Metals = As, Cd, Cr, Cu, Hg, Ni, Pb, and Zn), TRH = Total Recoverable Hydrocarbons, PAH = Polycyclic Aromatic Hydrocarbons, PCB = Polychlorinated Biphenyls, BTEX = Benzene, Toluene, Ethylbenzene, and Xylene

1009382

1 DAY TAT Additional Analysis FW: Eurofins Test Results - Report 1009382 : Site WARRIEWOOD DSI (2148)

Asim Khan

Tue 2023-07-25 3:59 PM

To:#AU25_Enviro_Sample_NSW <EnviroSampleNSW@eurofins.com>;Ryan Phillips <RyanPhillips@eurofins.com>

Cc:Adam Bateup <AdamBateup@eurofins.com>

Additional analysis please on 1 day TAT.

Thanks,

Kind regards,

Asim Khan
Analytical Services Manager
Please note my hours are from 9:30 am to 5:30 pm

Eurofins Environment Testing Australia Pty Ltd
Phone: +61 2 9900 8432
Mobile: +61 429 051 456

E-mail: AsimKhan@eurofins.com

From: Mitchell Kirby <mitchell@sydneyenvironmental.com.au>
Sent: Tuesday, 25 July 2023 3:31 PM
To: Adam Bateup <AdamBateup@eurofins.com>
Cc: Asim Khan <AsimKhan@eurofins.com>
Subject: RE: Eurofins Test Results - Report 1009382 : Site WARRIEWOOD DSI (2148)

Hi Adam,

Could we please get the fibre cement fragments ‘FC01’ and ‘TP08-FC’ analysed from Asbestos ID on 1 day TAT.

Kind Regards,

Mitchell Kirby | Project Manager / Environmental Consultant

M. Environmental Science / NSW LAA

Sydney Environmental Group

E: mitchell@sydneyenvironmental.com.au
W: http://www.sydneyenvironmental.com.au
M: 0433 518 334
P: 1300 884 164

Sydney Environmental Group acknowledges the Traditional Owners of the land upon which we live and work and pay our respects to their Elders past, present and emerging.

Sydney Environmental Group's management systems are certified to ISO9001:2015 (Quality), ISO45001:2015 (OH&S) and ISO14001:2015 (Environment).

Climate Active Carbon Neutral ORGANISATION

JAS-ANZ

WWW.JAS-ANZ.ORG/REGISTER

Please consider the environment before printing this email.

From: AdamBateup@eurofins.com <AdamBateup@eurofins.com>
Sent: Monday, July 24, 2023 11:08 PM
To: Mitchell Kirby <mitchell@sydneyenvironmental.com.au>
Cc: Patrick Brown <patrick@sydneyenvironmental.com.au>
Subject: Eurofins Test Results - Report 1009382 : Site WARRIEWOOD DSI (2148)

Please find the attached draft reports, please disregard my previoius email.

Kind regards,
Adam Bateup
Assistant Analytical Services Manager
My hours are 3 pm - 11 pm

Eurofins Environment Testing Australia Pty Ltd

179 Magowar Road
Girraween, NSW, 2145

Email: AdamBateup@eurofins.com
Website: www.eurofins.com/environmental-testing
View our latest EnviroNotes

1	**UCL Statistics for Uncensored Full Data Sets**											
2												
3	User Selected Options											
4	Date/Time of Computation	ProUCL 5.125/07/2023 12:31:13 PM										
5	From File	WorkSheet.xls										
6	Full Precision	OFF										
7	Confidence Coefficient	95%										
8	Number of Bootstrap Operations	2000										
9												
10												
11	**C0**											
12												
13	**General Statistics**											
14	Total Number of Observations	26			Number of Distinct Observations	23						
15					Number of Missing Observations	0						
16	Minimum	5			Mean	81.93						
17	Maximum	440			Median	46.5						
18	SD	96.96			Std. Error of Mean	19.01						
19	Coefficient of Variation	1.183			Skewness	2.488						
20												
21	**Normal GOF Test**											
22	Shapiro Wilk Test Statistic	0.692			**Shapiro Wilk GOF Test**							
23	5% Shapiro Wilk Critical Value	0.92			Data Not Normal at 5% Significance Level							
24	Lilliefors Test Statistic	0.276			**Lilliefors GOF Test**							
25	5% Lilliefors Critical Value	0.17			Data Not Normal at 5% Significance Level							
26	**Data Not Normal at 5% Significance Level**											
27												
28	**Assuming Normal Distribution**											
29	**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**							
30	95% Student's-t UCL	114.4			95% Adjusted-CLT UCL (Chen-1995)	123.1						
31					95% Modified-t UCL (Johnson-1978)	116						
32												
33	**Gamma GOF Test**											
34	A-D Test Statistic	0.699			**Anderson-Darling Gamma GOF Test**							
35	5% A-D Critical Value	0.771			Detected data appear Gamma Distributed at 5% Significance Level							
36	K-S Test Statistic	0.161			**Kolmogorov-Smirnov Gamma GOF Test**							
37	5% K-S Critical Value	0.176			Detected data appear Gamma Distributed at 5% Significance Level							
38	**Detected data appear Gamma Distributed at 5% Significance Level**											
39												
40	**Gamma Statistics**											
41	k hat (MLE)	1.111			k star (bias corrected MLE)	1.009						
42	Theta hat (MLE)	73.73			Theta star (bias corrected MLE)	81.23						
43	nu hat (MLE)	57.78			nu star (bias corrected)	52.45						
44	MLE Mean (bias corrected)	81.93			MLE Sd (bias corrected)	81.58						
45					Approximate Chi Square Value (0.05)	36.81						
46	Adjusted Level of Significance	0.0398			Adjusted Chi Square Value	35.95						
47												
48	**Assuming Gamma Distribution**											
49	95% Approximate Gamma UCL (use when n>=50)	116.7			95% Adjusted Gamma UCL (use when n<50)	119.5						
50												
51	**Lognormal GOF Test**											
52	Shapiro Wilk Test Statistic	0.975			**Shapiro Wilk Lognormal GOF Test**							
53	5% Shapiro Wilk Critical Value	0.92			Data appear Lognormal at 5% Significance Level							
54	Lilliefors Test Statistic	0.117			**Lilliefors Lognormal GOF Test**							
55	5% Lilliefors Critical Value	0.17			Data appear Lognormal at 5% Significance Level							
56	**Data appear Lognormal at 5% Significance Level**											
57												
58	**Lognormal Statistics**											

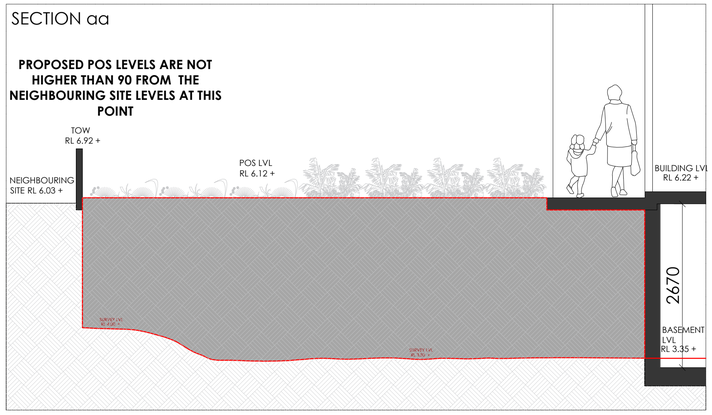
59	Minimum of Logged Data					1.609	Mean of logged Data					3.893
60	Maximum of Logged Data					6.087	SD of logged Data					1.053
61												
62	**Assuming Lognormal Distribution**											
63	95% H-UCL					146.8	90% Chebyshev (MVUE) UCL					141.7
64	95% Chebyshev (MVUE) UCL					168.4	97.5% Chebyshev (MVUE) UCL					205.4
65	99% Chebyshev (MVUE) UCL					278.2						
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
69												
70	**Nonparametric Distribution Free UCLs**											
71	95% CLT UCL					113.2	95% Jackknife UCL					114.4
72	95% Standard Bootstrap UCL					112.3	95% Bootstrap-t UCL					139.1
73	95% Hall's Bootstrap UCL					137	95% Percentile Bootstrap UCL					113.9
74	95% BCA Bootstrap UCL					123.7						
75	90% Chebyshev(Mean, Sd) UCL					139	95% Chebyshev(Mean, Sd) UCL					164.8
76	97.5% Chebyshev(Mean, Sd) UCL					200.7	99% Chebyshev(Mean, Sd) UCL					271.1
77												
78	**Suggested UCL to Use**											
79	95% Adjusted Gamma UCL					119.5						
80												
81	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
82	Recommendations are based upon data size, data distribution, and skewness.											
83	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
84	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
85												

APPENDIX C

SITE PLANS

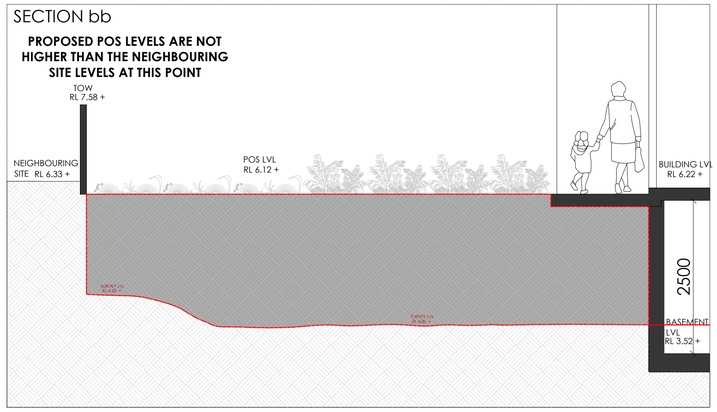
SECTION aa

PROPOSED POS LEVELS ARE NOT HIGHER THAN 90 FROM THE NEIGHBOURING SITE LEVELS AT THIS POINT



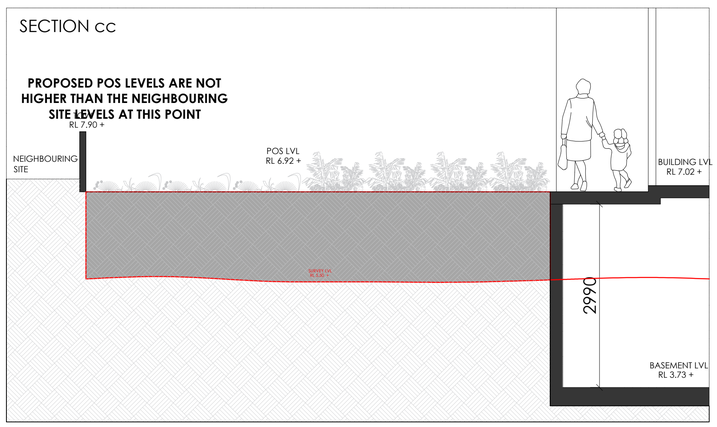
SECTION bb

PROPOSED POS LEVELS ARE NOT HIGHER THAN THE NEIGHBOURING SITE LEVELS AT THIS POINT



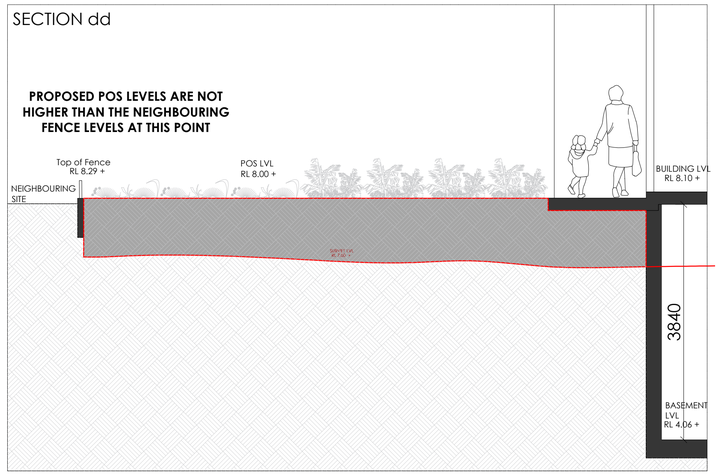
SECTION cc

PROPOSED POS LEVELS ARE NOT HIGHER THAN THE NEIGHBOURING SITE LEVELS AT THIS POINT



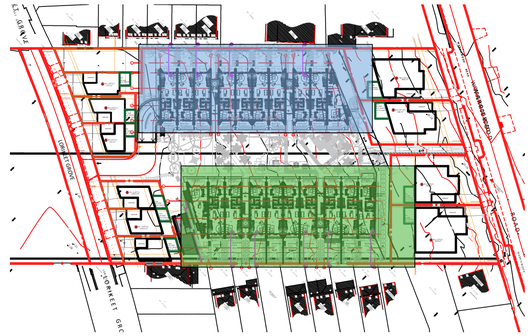
SECTION dd

PROPOSED POS LEVELS ARE NOT HIGHER THAN THE NEIGHBOURING FENCE LEVELS AT THIS POINT

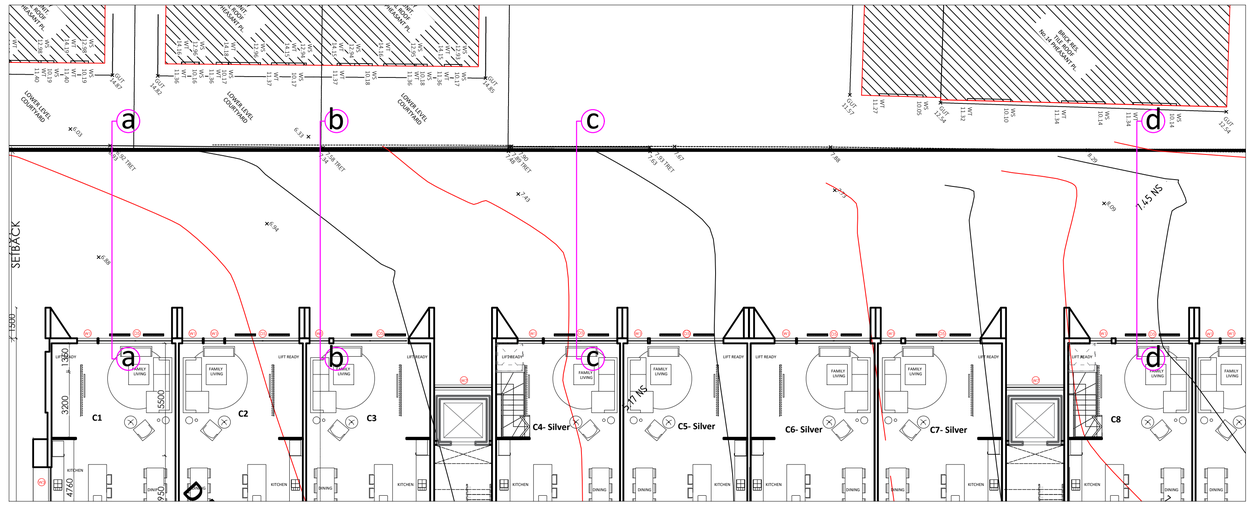


PROPOSED EARTH FILL

PART A **PART B**



PART A



KEY PLAN

PROPOSED RESIDENTIAL DEVELOPMENT

45-49 WARRIEWOOD ROAD, WARRIEWOOD, NSW

LEVELS ANALYSIS - PART A

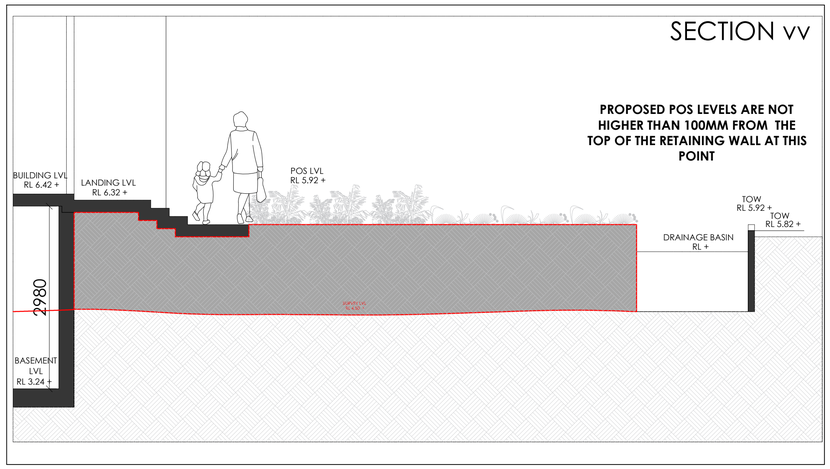
ARCHIDROME
SUITE 601, 90 GEORGE STREET, HORNSBY, N.S.W 2077 TARUNCHADHA@ARCHIDROME.NET ARCHITECT'S REG. NO. 8777

DRWG. NO. A-R-08

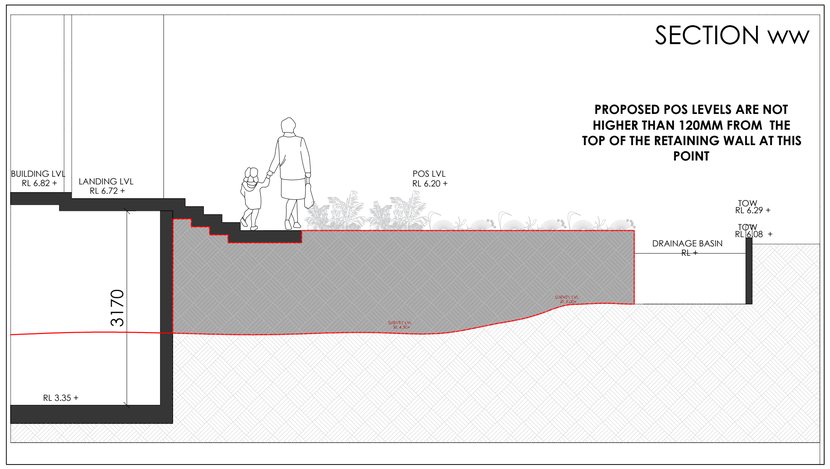
SCALE 1: 200 @A1

14/07/23

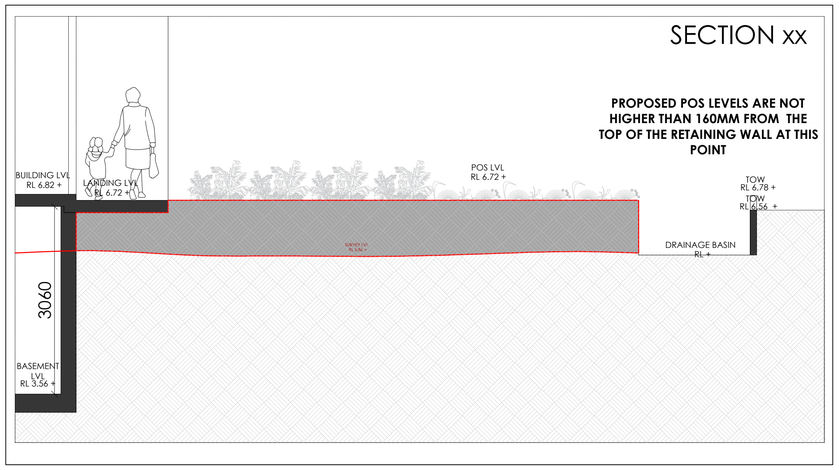
SECTION vv



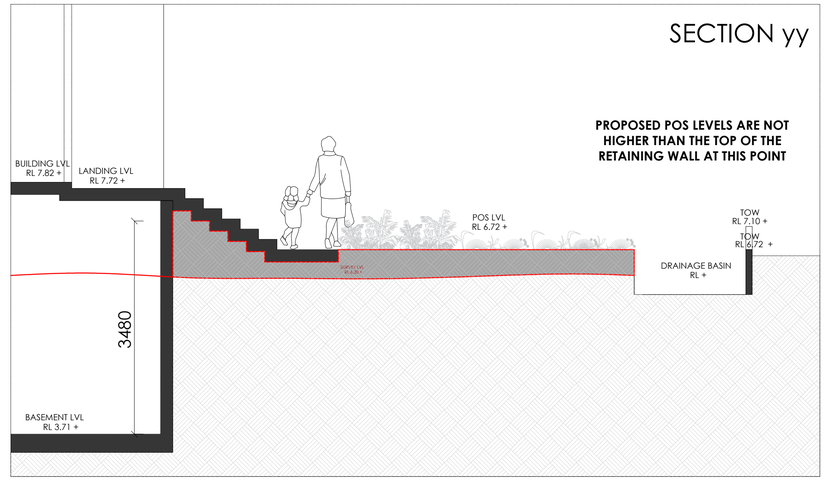
SECTION ww



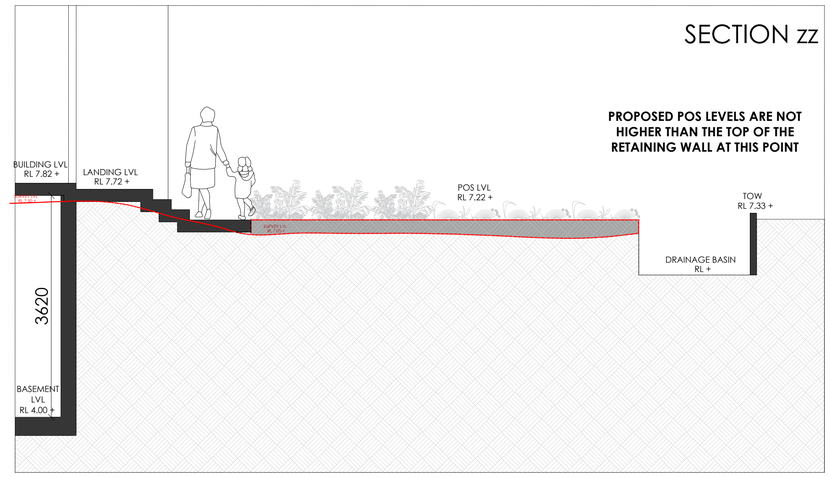
SECTION xx



SECTION yy

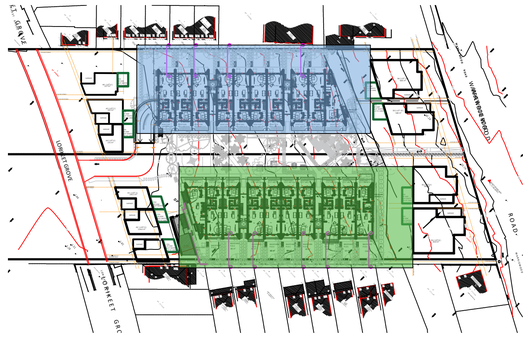


SECTION zz

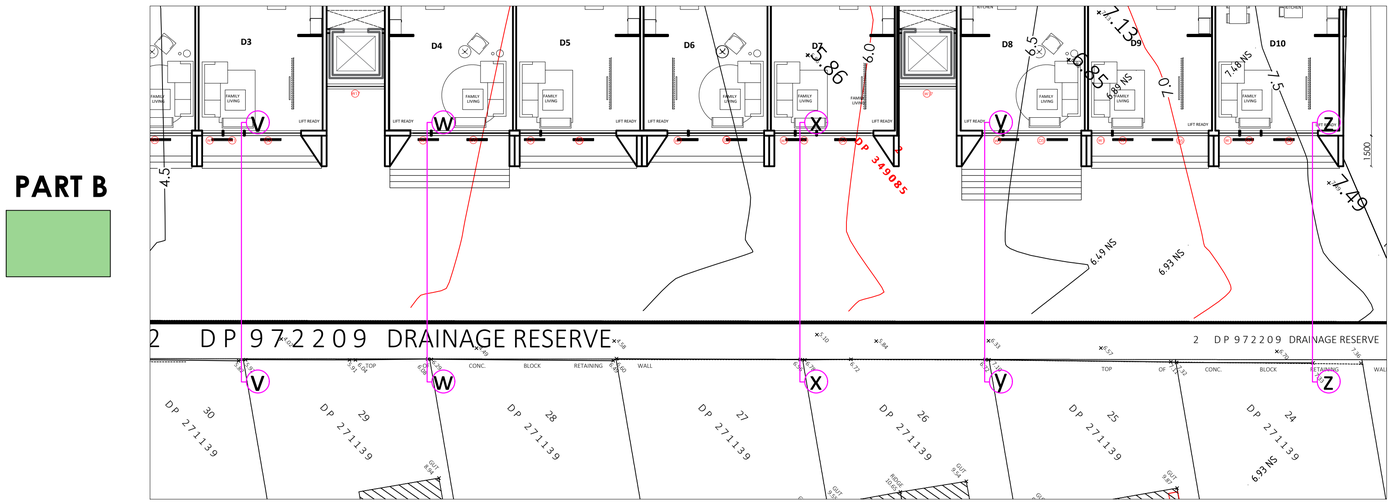


PROPOSED EARTH FILL

PART A **PART B**



PART B



KEY PLAN

PROPOSED RESIDENTIAL DEVELOPMENT

45-49 WARRIEWOOD ROAD, WARRIEWOOD, NSW

LEVELS ANALYSIS - PART B

ARCHIDROME

SUITE 601, 90 GEORGE STREET, HORNSBY, N.S.W 2077 TARUNCHADHA@ARCHIDROME.NET ARCHITECT'S REG. NO. 8777

DRWG. NO. A-R-08

SCALE 1: 200 @A1

14/07/23