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WARRIMAC PTY LTD C/- IPM DEVELOPMENTS PTY LTD

Additional Site Investigation

16 Macpherson St, Warriewood NSW

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EXECUTIVE SUMMARY

EI Australia (EI) was engaged by Warrimac Pty Ltd c/- IPM Developments Pty Ltd ('the client') to conduct an Additional Site Investigation (ASI) of the land parcel located at 16 Macpherson St, Warriewood NSW (the site).

Based on preliminary information, the client intends on purchasing the property for potential site redevelopment. The purpose of this investigation was to determine the environmental condition (contamination status) of the site.

EI understand that the intended proposed development involves the construction of 29 townhouses and internal roads. Townhouses are likely to be 2 storeys with no basement car parking. The site will be required to be filled / raised by approximately 1-2m to meet flood requirements. It is understood there will be no disturbance of soils greater then 2m below the existing ground level.

This ASI follows a previous (preliminary) investigation completed for the site by Douglas Partners (DP), which was documented under the following report:

- DP (2004) *Report on Preliminary Contamination Assessment for Sector 3, Macpherson Street Warriewood Valley*, Project No. 37273, dated November 2004.

Objectives

The objectives of this investigation were to:

- Evaluate the potential for site contamination on the basis of historical land uses, anecdotal and documentary evidence of possible pollutant sources;
- Assess the degree of any soil contamination, by means of intrusive sampling and laboratory analysis for the relevant potential contaminants;
- Provide a conclusion regarding suitability of the site for proposed use; and
- Make recommendations for the appropriate management of any impacted soils, should site contamination be confirmed.

Findings

The key findings from this ASI were as follows:

- The site was occupied by a residential dwelling and a nursery;
- With reference to the Hornsby/Mona Vale Acid Sulfate Soil Risk Map (1:25,000 scale; Murphy, 1997), the site lies within the class description of 'Wa4 Low Probability, Greater than 3 meters below the ground surface '. The Pittwater Local Environmental Plan 2014 Acid Sulfate Soils Map (Sheet ASS_012) indicates that the site lies within a Class 4 risk area. In such cases, council consent is required prior to commencing any works more than 2 metres below the natural ground surface and works by which the watertable is likely to be lowered more than 2 metres below the natural ground surface. Given the nature of the proposed development, soil 2m below the current site levels will not be disturbed, as such management planning of acid sulfate soils is not required.
- No visible or olfactory signs of contamination were noted by EI field staff during the inspection, including fragments of fibre cement sheeting (FCS) on the site surfaces;
- Based on the borehole logs (BH101-BH110), the site lithology was generalised as a layer of silty sand / sand filling (up to 1m depth), overlying natural, clayey sand and clay;
- Contaminant concentrations in the soil samples were all below the adopted investigation levels applicable to residential with garden/accessible soil setting; and

- Based on the analytical results, the following preliminary was classifications were provided (with reference to the EPA (2014) *Waste Classification Guidelines*):
  - The fill materials on the site can be classified as *General Solid Waste* (non-putrescible) for offsite disposal purposes; and
  - The underlying natural soils on the site can be classified as *Virgin Excavated Natural Material* (VENM).

Conclusions

Based on the findings from this ASI conducted in accordance with the investigation scope agreed with the Client, and with consideration of the Statement of Limitations, EI conclude that the site can be made suitable, subject to the following recommendations:

- Once the current site has been vacated and prior to commencement of any demolition, a Hazardous Materials Survey (HMS) should be completed by a suitably qualified hazardous materials consultant, to identify any hazardous materials present within the existing building fabrics.
  - If present, all identified hazardous materials must be appropriately managed, to maintain worker health and safety during demolition works and prevent the spread of hazardous substances;
  - An asbestos clearance inspection and certificate should be completed by a suitably qualified professional (SafeWork NSW Licensed Asbestos Assessor) following the removal of all ACM from the site (if identified); and
  - Where clearance inspection indicates the presence of hazardous materials remaining in or on soils at the site, further removal and clearance works should be undertaken;
- Additional eight (8) soils sampling locations will be required within the footprint of current site buildings following demolition to meet minimum number of sampling locations (EPA, 1995);
- A Remedial Action Plan (RAP) should be prepared and implemented if any contamination identified during supplementary sampling underneath the current site buildings. The RAP should provide details of the methodology and procedures;
- Any material being imported to the site to raise the site level should be validated as suitable for the intended use in accordance with EPA guidelines, including soils classified as Virgin Excavated Natural Material or Excavated Natural Material.

1. INTRODUCTION

1.1 Background and Purpose

EI Australia (EI) was engaged by Warrimac Pty Ltd c/- IPM Developments Pty Ltd ('the client') to conduct an Additional Site Investigation (ASI) of the land parcel located at 16 Macpherson St, Warriewood NSW (herein referred to as the 'the site').

The site is located approximately 22 km north-east of the Sydney central business district (CBD), within the local government area (LGA) of Northern Beaches Council, as shown in **Appendix A**, **Figure 1**. The site is comprised of one cadastral allotment, identified as Lot 4 in Deposited Plan (DP) 553816, covering a total area of 1.02 hectare (ha), as depicted in **Appendix A, Figure 2**. At the time of the investigation, the southern part of the site was occupied by a two-storey residential dwelling and the northern part of the site was occupied by a single level garden centre.

Based on preliminary information, the client intends on purchasing the property for potential site redevelopment. The purpose of this investigation was to determine the environmental condition (contamination status) of the site.

1.2 Proposed Development

Based on draft of the Subdivision Plan supplied by the client (**Appendix C**), EI understands that intended site redevelopment will involve the construction of 29 townhouses and internal roads. Townhouses are likely to be 2 storeys with no basement car parking. The site will be required to be filled / raised by approximately 1-2m to meet flood requirements. It is understood there will be no disturbance of soils greater then 2m below the existing ground level.

1.3 Regulatory Framework

The following regulatory framework and guidelines were considered during this ASI:

- *Contaminated Land Management Act 1997* (the CLM Act 1997);
- *Protection of the Environment Operations Act 1997* (the POEO Act 1997);
- *Environmental Planning and Assessment Act 1979* (the EP&A Act 1997);
- *State Environmental Planning Policy 55 - Remediation of Land* (SEPP 55);
- *Pittwater Local Environmental Plan 2014;*
- EPA (1995) *Sampling Design Guidelines;*
- EPA (2017) *Guidelines for the NSW Site Auditor Scheme;*
- EPA (2020) *Consultants Reporting on Contaminated Land: Contaminated Land Guideline*s; and
- NEPC (2013) *Schedule B(1) Guideline on Investigation Levels for Soil and Groundwater* and *Schedule B(2) Guideline on Site Characterisation,* in the *National Environmental Protection (Assessment of Site Contamination) Amendment Measure 1999.*

1.4 Project Objectives

The objectives of this investigation were to:

- Evaluate the potential for site contamination on the basis of historical land uses, anecdotal and documentary evidence of possible pollutant sources;
- Assess the degree of any soil contamination, by means of intrusive sampling and laboratory analysis for the relevant potential contaminants;
- Provide a conclusion regarding suitability of the site for proposed use; and
- Make recommendations for the appropriate management of any impacted soils, should site contamination be confirmed.

1.5 Scope of Works

To achieve the above objectives, the following scope of works was completed:

Desktop Study

- Evaluate the potential for site contamination on the basis of historical land uses, anecdotal and documentary evidence of possible pollutant sources; and
- A review of relevant (hydro)geological and soil landscape maps for the project area

Fieldwork and Laboratory Analysis

- Preparation of a Work, Health, Safety and Environmental Plan;
- A review of existing underground services on-site, utilising *Dial-Before-You-Dig* (DBYD) plans and electro-magnetic equipment operated by a licensed services locator;
- A site walkover inspection;
- Construction of test boreholes at ten locations (BH101-BH110), distributed in a triangular grid pattern across accessible parts of the site;
- Multiple level soil sampling within fill and natural soils at each of the test bores; and
- Laboratory analysis of selected soil samples for relevant analytical parameters, as determined from the desktop study and field observations.

Data Analysis and Reporting

This ASI report documents all desk study findings, the conceptual site model, data quality objectives, investigation methodologies and results. It also provides a record of observations made during the site walkover inspection, borehole and monitoring well construction logs and a discussion of laboratory analytical results in regards to potential risks to human health, the environment and the aesthetic condition of the land.

2. SITE DESCRIPTION

2.1 Property Identification, Location and Physical Setting

The site identification details and associated information are presented in **Table 2-1**. The site locality and assessment area are illustrated in **Appendix A**, **Figures 1** and **2**.

Table 2-1 Site Identification

Attribute	Description
Street Address	16 Macpherson St, Warriewood NSW
Location Description	Approximately 22 km north-east of Sydney CBD, **North-west**: residential properties; **North-east**: Narrabeen Creek Wildlife Protection Area and followed by residential properties; **South-east**: Brands Lane followed by aged care; and **South-west**: Macpherson Street, then residential properties.
Site Coordinates	North corner of site (GDA2020-MGA56): ▪ Easting: 341944.03; ▪ Northing: 6271385.528. (Source: http://maps.six.nsw.gov.au)
Site Area	1.02 ha
Lot and DP	Lot 4 in DP 553816
State Survey Marks	Four state survey marks are situated within close proximity (<50m) to the site: ▪ SS206447: at Chambers Circuit, in front of 18D Macpherson Street (28m north-west of the site); ▪ SS206439: at Chambers Circuit, in front of 58 Chambers Circuit (29m north-west of the site); ▪ SS206440: at Chambers Circuit, in front of 53 Chambers Circuit (25m north-west of the site); ▪ SS206443: at Chambers Circuit, north of 49 Chambers Circuit (35m north-west of the site); and ▪ SS141965 and SS145906: at the intersection of Macpherson Street and Fantail Avenue Street (approximately 17m south-west of the site). (Source: http://maps.six.nsw.gov.au)
LGA	Northern Beaches Council
Parish	Narrabeen
County	Cumberland
Current Zoning	R3 Medium Density Residential (Pittwater Local Environmental Plan 2014)

2.2 Surrounding Land Use

The site is situated within an area of mixed use, as described in **Table 2-2**. The local sensitive receptors within close proximity to the site are also identified in this table.

Table 2-2 Surrounding Land Uses

Direction	Land Use Description	Sensitive Receptors (distance from site)
North-west	Residential properties	Residential (adjacent to the site)
North-east	Narrabeen Creek Wildlife Protection Area and followed by residential properties	Residential (approximately 40m north-east)
South-east	Brands Lane followed by aged care	Residential (approximately 10m south-east)
South-west	Macpherson Street, then residential properties	Residential (approximately 20m south-west)

2.3 Regional Setting

The topography, (hydro)geology and soil landscape information are summarised in **Table 2-3**.

Table 2-3 Regional Setting

Attribute	Description
Topography	The site has a moderate slopping topography towards the north-east, with site levels varying from 6m AHD at the south-west of the site to 4m AHD at the north-east of the site.
Site Drainage	The site is partially covered with hardstand pavements. Stormwater is expected to be flows towards Narrabeen Creek, which is adjacent to site north-eastern boundary.
Regional Geology	According to the Department of Mineral Resources *Sydney 1:100,000 Geological Series Sheet 9130* the site is underlain by the (Qha) silty to peaty quartz sand, silt, and clay. Ferruginous and humic cementation in place. Common shell layers.
Soil Landscape	The Soil Conservation Service of NSW *Soil Landscapes of the Sydney 1:100,000 Sheet* (Chapman and Murphy, 1989) indicates that the site overlies a swamp Warriewood (wa) soil landscape. This landscape type is characterised by level to gently undulating swales, depressions and infilled lagoons on Quaternary sands.
Acid Sulfate Soil (ASS) Risk	With reference to the *Hornsby/Mona Vale Acid Sulfate Soil Risk Map* (1:25,000 scale; Murphy, 1997), the site lies within the class description of '*Wa4 Low Probability, Greater than 3 meters below the ground surface '*. The *Pittwater Local Environmental Plan 2014 Acid Sulfate Soils Map* (Sheet ASS_012) indicates that the site lies within a *Class 4* risk area. In such cases, council consent is required prior to commencing any works more than 2 metres below the natural ground surface and works by which the watertable is likely to be lowered more than 2 metres below the natural ground surface. Given the map information and the proposed development, further assessment of ASS was considered unwarranted for the subject site.
Nearest Surface Water Feature	Narrabeen Creek, adjacent to site north-eastern boundary.

2.4 Groundwater Bore Records and Local Groundwater Use

EI conducted an online search of registered groundwater bores through WaterNSW (Ref. https://realtimedata.waternsw.com.au/water.stm) on 18 February 2022. The search revealed four registered bore within a 500 m radius of the site, as presented in **Table 2-4**.

Table 2-4 Summary of Registered Groundwater Bores

Bore No.	Distance and Direction	Date Drilled	Drilled Depth (m)	SWL(m BGL)* / Salinity	Bore Purpose
GW108034	Onsite	26/05/2006	2.50	0.90/NA	Test Bore
GW106698	105m south-east	11/10/2004	3.00	NA/NA	Monitoring Bore
GW106699	100m south-east	11/10/2004	3.00	NA/NA	Monitoring Bore
GW106697	180m south-east	11/10/2004	3.00	NA/NA	Monitoring Bore

2.5 Site Walkover Inspection

Observations were recorded during a walkover inspection of the site on 14 February 2022. These are summarised below and photographs taken during the inspection are presented in **Appendix D**.

- The site was located on the north-western corner of Macpherson Street and Brands Lane. Surrounding land uses were newly developed residential properties in west, east and south directions and Narrabeen Creek Wildlife Protection Area adjacent to the north of the site;
- The southwestern portion of the site was occupied by a residential dwelling (**Photographs 1** and **2**). The remainder of the site was a nursey (**Photographs 3** to **8**);
- The residential property fronting Macpherson Street was occupied by a two storey brick house with tiled and metal roof, a galvanised iron (GI) garden shed, metal carport, concrete driveway and grass yard;
- The nursery was occupied by glasshouses, several GI sheds, metal office building, bitumen carpark and stacks of plants. Fibre-cement materials were observed on the wall and roof of the glasshouses (**Photograph 6**); and
- No other visible or olfactory signs of contamination were noted by EI field staff during the inspection. No underground storage tank (UST) or above-ground storage tank (AST) was observed to be present on site.

3. PREVIOUS INVESTIGATIONS

EI were provided with one previous environmental investigation completed for the site by Douglas Partners (DP; 2004) which was documented under the following report:

- DP (2004) *Report on Preliminary Contamination Assessment for Sector 3, Macpherson Street Warriewood Valley*, Project No. 37273, dated November 2004.

The previous environmental investigation (DP, 2004), covered the whole area of 16-22 Macpherson Street Warriewood NSW. Site area historically identified as Lot 1 in DP592091 and Lot 1 in DP 604035 has been subdivided into different lots which are not covered by this report. The current investigation is only applicable to 16 Macpherson Street Warriewood identified as Lot 4 in DP 553816.

A summary of the investigations is provided in **Table 3-1**.

Table 3-1 Summary of Previous Investigations

Project Task	Findings
DP (2004) Preliminary Contamination Assessment	
Objectives	The assessment was conducted on behalf of the Mirvac Homes (NSW) Pty Ltd for proposed Warriewood Valley Section 3 Rezoning. Development of medium density residential dwellings has been proposed. This assessment also included the neighbouring site to the north.
Scope of Works	The scope of the investigation included: ▪ Site history review; ▪ Drilling and sampling from 15 test bores; ▪ Analysis of 23 selected soil samples for various combinations of the identified potential contaminants; and ▪ Provision of a Preliminary Contamination Assessment Report, providing general comments on the level of contamination in the subsoils and the suitability of the site for the proposed development.
Findings	▪ Reference to the title deeds and aerial photographs indicated that the site has been used for agriculture and market garden since at least 1947. Prior to this, the site was probably under agricultural and/or rural residential use. During 1970's and 1980's the site appears to have been gradually developed into retail nurseries; ▪ The extent of the filling layers on site was generally less than 1.0m, with exception of Bore 1 and 9. The filling included grey, brown and orange sand, clayey sand, sandy clay, silty clay and sandy clayey silt. Trace of crushed sandstone, charcoal, gravel and brick and terracotta fragments were observed in the surface filling; ▪ All PID readings were within the accepted background ranging from 0 to 10 ppm; ▪ The screening results indicated that Potential Acid Sulphate Soil (PASS) may be present at the site. No Actual Acid Sulphate Soil (AASS) was identified at the site; ▪ Based on the analytical results, no signs of chemical contamination were noted in the samples; and ▪ Asbestos was detected in one sample neighbouring the site to the north. No asbestos was identified on the subject site.
Conclusion/ Recommendation	▪ A hazardous material assessment is recommended at the site by an occupational hygienist; ▪ Additional investigation of asbestos in soil/filling at the site to assess the extent of asbestos contaminated filling at the neighbouring site next door; ▪ If bulk excavation or dewatering is proposed for the site it is considered that an Acid Sulphate Soil assessment, including in-situ sampling and Peroxide Oxidation

Project Task	Findings
	Combined Acidity and Sulphate (POCAS) analysis, will be required; and ▪ Based on the observations, site history and laboratory results it is considered that the site suitable for the proposed residential development. It is considered that the site can be rendered suitable for the proposed residential development by removal of asbestos containing materials and filling, and validation of the site with respect of asbestos.

4. CONCEPTUAL SITE MODEL

In accordance with NEPC (2013) *Schedule B2 – Guideline on Site Characterisation*, EI (2020) developed a CSM that assessed plausible linkages between potential contamination sources, migration pathways and human and environmental receptors. In this ASI, EI reviewed and updated the CSM in order to identify the gaps in the existing site characterisation.

4.1 Subsurface Conditions

The sub-surface conditions encountered at the site were generalised as a layer of shallow filling (to an average depth of 0.59m BGL), overlying natural clayey sand and clay.

Groundwater flow direction was expected to be towards Narrabeen Creek, adjacent to the north of the site.

4.2 Potential Contamination Sources

The potential contamination sources were as follows:

- Imported fill soils of unknown origin and quality (used to grade the site);
- Hazardous building materials (including asbestos-containing materials (ACM)) present within the fabrics of the (former / existing) site structures, and weathering fall-out to the ground surface;
- Leaks from vehicles in unpaved driveway and parking areas; and
- Former agricultural/market garden activities on site.

4.3 Emerging Contaminants

Per- and Poly- Fluoroalkyl Substances (PFAS)

EPA (2017) requires that PFAS are considered when investigating land contamination. The probability of PFAS occurrence, which was based on considerations outlined in the *PFAS National Environmental Management Plan* (NEMP 2020), is reviewed in **Table 4-1**. In this instance, the potential for PFAS to be present on-site was low.

Table 4-1 PFAS Decision Tree

Preliminary Screening	Probability of Occurrence[1]
Has an activity listed in NEMP (2020) [2] as being associated with PFAS contamination occurred on-site? If so, list activity: **Petroleum products storage**	L (No evidence suggested a fire occurred onsite)
Has an activity listed in NEMP (2020) [2] as being associated with PFAS contamination occurred up-gradient or adjacent to the site? If so, list activity.	L
Did fire training involving the use of suppressants occur on-site between 1970 and 2010?	L
Did fire training occur up-gradient or adjacent to the site between 1970 and 2010? [3]	L
Have "fuel" fires ever occurred on-site between 1970 and 2010? (e.g. ignition of fuel (solvent, petrol, diesel, kero) tanks?)	L
Have PFAS been used in manufacturing or stored on-site? [4]	L
Could PFAS have been imported to the site in fill materials from a site with an activity listed in NEMP (2020)?	L

Preliminary Screening	Probability of Occurrence[1]
Could PFAS-contaminated groundwater or run-off have migrated on to the site?	L
Is the site or adjacent sites listed in the NSW EPA PFAS Investigation Program? [5]	L
If the probability is medium or high in any of the rows, does the site analytical suite need to be optimised to include preliminary sampling and testing for PFAS in soil (including ASLP testing) and waters?	No

Note 1 Probability: L – low (all necessary documentation has been reviewed and there is no recorded instance or compelling rationale); M – moderate (all necessary documentation has been reviewed and there is potential evidence of a recorded instance with compelling rationale); H – high (all necessary documentation has been reviewed and there is evidence of a recorded instance with compelling rationale).
Note 2 Activities listed in Appendix B of NEMP (2020).
Note 3 Runoff from up-gradient PFAS use may impact surface water, soil, sediment and groundwater.
Note 4 PFAS is used wide range of industrial processes and consumer products, including in the manufacture of non-stick cookware, specialised garments and textiles, Scotchguard™ and similar products (used to protect fabric, furniture, leather and carpets from oils and stains), metal plating and in some types of fire-fighting foam. (https://www.nicnas.gov.au/chemical-information/factsheets/chemical-name/perfluorinated-chemicals-pfas)
Note 5 Refer to https://www.epa.nsw.gov.au/your-environment/contaminated-land/pfas-investigation-program.

Emerging Chemicals

The EPA uses Chemical Control Orders (CCOs) as a primary legislative tool under the *Environmentally Hazardous Chemicals Act 1985*, to control chemicals of concern and limit their potential impact on the environment. Considerations for chemicals controlled by CCOs, and other potential emerging chemicals, are outlined in **Table 4-2**. In this instance, the potential for an emerging chemical of concern to be present on-site was low, with the possible exceptions of polychlorinated biphenyls and pesticides in imported fill and near surface soil.

Table 4-2 Emerging or Controlled Chemicals

Chemicals of Concern (CCO or emerging)	Decision
Were aluminium smelter wastes used or stored on site (CCO, 1986)?	No
Do dioxin contaminated wastes (CCO, 1986) have the potential to impact the site? [1]	No
Were organotin products (CCO, 1989) used or stored on site? [2]	No
Were polychlorinated biphenyls (PCBs) used or PCB wastes (CCO, 1997) stored on-site? [3]	Possibly in imported fill
Were scheduled chemical or wastes (CCO, 2004) used or stored? [4]	Possibility for pesticides to have been applied and/or present in imported fill
Are other emerging chemicals suspected? [5]	No
If Yes to any questions, has site sampling suite been optimised to include sampling for these chemicals of concern?	Yes

Note 1 From burning of certain chemicals, smelting or chemical manufacturing or fire on or near the site.
Note 2 From anti-fouling paints used or removed at boat and ship yards and marinas.
Note 3 From older transformer oils and electrical capacitors
Note 4 Twenty-four mostly organochlorine pesticides and industrial by-products
Note 5 Other chemicals considered as emerging (e.g. 1,4 dioxane; associated with some CVOC).

4.4 Potential Contaminants

The primary contaminants of potential concern (COPCs) at the site were considered to be:

- Priority Metals (Met) - arsenic, cadmium, chromium, copper, lead, mercury, nickel, zinc;
- Total Recoverable Hydrocarbons (TRH);

- Benzene, Toluene, Ethylbenzene and Xylenes (BTEX);
- Polycyclic Aromatic Hydrocarbons (PAH);
- Organochlorine and Organophosphorus Pesticides (OCP / OPP);
- Polychlorinated Biphenyls (PCB); and
- Asbestos.

4.5 Risk Assessment

An assessment of the potential contamination risks for the site is outlined in **Table 4-3**.

Table 4-3 Assessment of Potential Contamination Risk

Potential Source	Impacted Medium	COPC	Risk of Contamination
Imported fill soils of unknown origin and quality	Shallow soil	Met, TRH, BTEX, PAH, OCP, OPP, PCB and asbestos	**Low** Based on the borehole logs (**Appendix E**), shallow filling was present onsite (to an average depth of 0.59m). Contamination risk was considered low.
Hazardous building materials	Building fabrics Surface soil	Met (lead in particular), PCB and asbestos	**Moderate** Based on the age of construction, hazardous building products may be present in the former and existing structures.
Leakage from vehicles in driveway and parking areas	Shallow soil	Met, TRH, BTEX and PAH	**Low to Moderate** Contamination, if present, likely to be localised and restricted to surface or shallow soils. Surface pavements on the site were in poor to fair condition, with cracks throughout; however, no oil staining was observed.
Former market garden activities	Soil	OCP, OPP	**Low** The PSI (DP, 2004) identified agricultural and market garden activities in site history. Any impacts will likely be localised and restricted to surface or shallow soils.

4.6 Exposure Pathways and Receptors

The following potential receptors of site contamination were identified:

- Demolition and construction workers;
- Users of the adjacent land during construction;
- Future site users; and
- Ecological receptors in local surface water systems in hydraulic connectivity with groundwater at the site.

Given the assessment conducted in **Section 4.5**, the risks to these receptors were considered to be low to moderate.

A summary of the CSM is provided in **Table 4-4**, identifying the potential contamination sources, exposure pathways and human and environmental receptors.

4.7 Data Gap

Based on the CSM derived for the site and the qualitative assessment of risks, the degree (presence / extent) of any impacts associated with the identified contamination sources

constituted an investigation data gap. This data gap required further assessment by way of further intrusive sampling and analysis, to quantify the possible risks to the site receptors.

Table 4-4 Conceptual Site Model

Potential Sources	Impacted Media	Contaminants of Potential Concern	Transport mechanism	Exposure pathway	Potential receptor
Imported fill soils Hazardous building materials Leaks from vehicles Former market garden activities	Soil	Met, TRH, PAH, OCP, OPP, PCB and asbestos	Disturbance of surface and subsurface soils during site redevelopment, future site maintenance and future use of the site post redevelopment Atmospheric dispersion from soil to outdoor and indoor air spaces Volatilisation of contamination from soil and diffusion to indoor air spaces	Ingestion Dermal contact Inhalation of particulates Inhalation of vapour	Demolition / construction workers Adjacent site users

5. METHODOLOGY

5.1 Sampling and Analysis Quality Plan (SAQP)

The SAQP ensures that the data collected during environmental works are representative and provide a robust basis for assessment decisions. The SAQP for this ASI included the following:

- Data quality objectives, including a summary of the objectives of the ASI;
- Investigation methodology, including the media to be sampled, details of analytes and parameters to be monitored and a description of intended sampling points;
- Sampling procedures (including sample handling, preservation and storage);
- Field screening methods;
- Laboratory analysis methods; and
- Analytical quality assurance / quality control (QA/QC).

5.2 Data Quality Objectives

In accordance with the NEPC (2013) *Schedule B2 Guideline on Site Characterisation*, the USEPA (2006) *Data Quality Assessment* and EPA (2017) *Guidelines for the NSW Site Auditor Scheme*, data quality objectives (DQO) were developed by the EI investigation team, following the NEPM- / EPA- endorsed, seven step process (**Table 5-1**). In doing so, the appropriate levels of data quantity and quality needed for the specific requirements of the project were established.

Table 5-1 Summary of Project Data Quality Objectives

DQO Step	Details
1. State the Problem Summarise the contamination problem that will require new environmental data, and identify the resources available to resolve the problem; develop a conceptual site model.	Site redevelopment involves the demolition of existing structures, followed by the construction of medium density residential dwellings, as outlined in **Section 1.2**. Based on the proposed land use, the NEPC (2013) setting of residential with gardens and accessible soils applies. The PSI (DP, 2004) identified the potential for soil contamination due to various possible sources, as listed in **Section 4.2**. A CSM has been developed (**Table 4-4**). The findings of the ASI must provide supportive information on the environmental condition of the site, to determine suitability for the proposed redevelopment.
2. Identify the Goal of the Study (Identify the decisions) Identify the decisions that need to be made on the contamination problem and the new environmental data required to make them.	Based on the objectives outlined in **Section 1.4**, the decisions that need to be made were: ▪ Has the nature, extent and source of any soil impacts onsite been defined? ▪ What impact do the site specific, geologic and hydrogeological conditions have on the fate and transport of any impacts that may be identified? ▪ Does the level of impact coupled with the fate and transport of identified contaminants represent an unacceptable risk to identified human and/or environmental receptors on or offsite? ▪ Does the collected data provide sufficient information to allow the suitability of the site to be determined, or selection and design of an appropriate remedial strategy, if necessary? ▪ If the data does not provide sufficient information, what data gaps require closure to enable the suitability of the site to be determined, or selection and design of an appropriate remedial strategy?
3. Identify Information Inputs (Identify inputs to decision) Identify the information needed to support any decision and specify which inputs require new environmental measurements.	Inputs to the decision making process included: ▪ The proposed development and land use; ▪ Review of the previous site investigations; ▪ National and NSW EPA guidelines made or approved under the *NSW Contaminated Land Management Act 1997*; ▪ Observations during / from soil sampling; and ▪ Laboratory analytical results for the selected soil samples. At completion of the ASI, a decision is required regarding the suitability of the site for the proposed redevelopment, or if additional investigation is required to confirm that the site is suitable for that development or if remediation is required to make the site suitable.
4. Define the Boundaries of the Study Specify the spatial and temporal aspects of the environmental media that the data must represent to support decision.	Lateral – The proposed development area, as shown on **Figure 2**, **Appendix A**; Vertical – Investigations were advanced to the depth of natural soils or rock; Temporal – The results were valid for the day samples were collected and remain so as long as no changes occur in regards to site use, and contamination (if present) does not migrate onto the site from off-site sources.

DQO Step	Details
5. Develop the Analytic Approach (Develop a decision rule) To define the parameter of interest, specify the action level, and integrate previous DQO outputs into a single statement that describes a logical basis for choosing from alternative actions.	The decision rules for the investigation were: ▪ If the concentrations of contaminants in the soil data exceed the adopted criteria, then assess the need to further investigate the extent of impacts onsite. ▪ Decision criteria for QA/QC measures are defined by the Data Quality Indicators (DQI) in **Table 5-2**.
6. Specify Performance or Acceptance Criteria (Specify limits on decision errors) Specify the decision-maker's acceptable limits on decision errors, which are used to establish performance goals for limiting uncertainties in the data.	Specific limits for this project were in accordance with National and NSW EPA guidance, and appropriate indicators of data quality and standard procedures for field sampling and handling. This included the following points to quantify tolerable limits: ▪ The null hypothesis for the investigation was that the 95% Upper Confidence Limits (UCL) of the mean for contaminants of concern exceed relevant residential with minimal access to soil land use criteria across the site. ▪ Acceptance of site suitability was based on the probability that: ‣ The 95% UCL of the mean of the data satisfied the given site criteria (thus, a limit on the decision error was 5% that a conclusive statement may be incorrect); ‣ The standard deviation of the results was less than 50% of the relevant criterion; and ‣ No single result exceeded the criterion by 250% or more. ▪ Soil concentrations for the potential chemicals that were below investigation criteria made or approved by the NSW EPA were treated as acceptable and indicative of suitability for the proposed land use(s). ▪ Samples to determine the presence of asbestos were collected from boreholes at the site. Test pits were not excavated as recommended in the NEPM (2013) due to the presence of expansive pavements. ▪ If contaminant concentrations exceeded the adopted criteria, further investigation was considered prudent. If no contamination was detected, no further action was required.
7. Develop the Detailed Plan for Obtaining Data (Optimise the design for obtaining data) Identify the most resource-effective sampling and analysis design for general data that are expected to satisfy the DQOs.	In order to identify the most resource-effective sampling and analysis design and satisfy the DQOs: ▪ Soil sampling was conducted at 10 locations across accessible parts of the site; ▪ Field screening of soil for potential VOCs was carried out with a portable Photo-Ionisation Detector (PID). ▪ An upper soil profile sample was collected at each borehole location and tested for the COPC, to assess the conditions of the fill layer, and impacts from activities at ground level. ▪ Further discrete, natural samples were analysed for primary metals, TRH, BTEX and PAH. Samples were selected on field observations (including visual and olfactory evidence), giving consideration to the subsurface stratigraphy. ▪ Review of the results was undertaken to determine if further sampling was warranted.

5.3 Data Quality Indicators

To ensure that the investigation data were of an acceptable quality, they were assessed against the quality indicators outlined in **Table 5-2**. Assessment of data quality is presented in **Section 6** and **Appendix I**.

Table 5-2 Data Quality Indicators

QA/QC Component	Data Quality Indicator(s)
Precision A quantitative measure of the variability (or reproducibility) of data	Data precision was assessed by reviewing the performance of blind field duplicate sample sets, through calculation of relative percentage differences (RPD). Data precision was deemed acceptable if RPDs were found to be less than 30%. RPDs that exceeded this range were considered acceptable where: ▪ Results were less than 10 times the limits of reporting (LOR); ▪ Results were less than 20 times the LOR and the RPD was less than 50%; or ▪ Heterogeneous materials or volatile compounds were encountered.
Accuracy A quantitative measure of the closeness of reported data to the "true" value	Data accuracy was assessed through the analysis of: ▪ Split field duplicate sample sets; ▪ Field and method blanks, analysed for the analytes targeted in the primary samples; ▪ Matrix spike and matrix spike duplicate sample sets; and ▪ Laboratory control samples.
Representativeness The confidence (expressed qualitatively) that data are representative of each medium present onsite	To ensure the data produced by the laboratory were representative of conditions encountered in the field, the following measures were taken: ▪ Blank samples run in parallel with field samples, to confirm there were no unacceptable instances of laboratory artefacts; ▪ Review of relative percentage differences (RPD) values for field and laboratory duplicates to provide an indication that the samples were generally homogeneous, with no unacceptable instances of significant sample matrix heterogeneities; and ▪ The appropriateness of collection methodologies, handling, storage, and preservation techniques was assessed to ensure/confirm there was minimal opportunity for sample interference or degradation (i.e. volatile loss during transport due to incorrect preservation / transport methods).
Completeness A measure of the amount of useable data from a data collection activity	Analytical data sets acquired during the ASI were evaluated as complete upon confirmation that: ▪ Standard operating procedures (SOPs) for sampling protocols were adhered to; and ▪ Copies of all chain of custody (COC) documentation were included and found to be properly completed. It could therefore be considered whether the proportion of "useable data" generated in the data collection activities was sufficient for the purposes of the land use assessment.
Comparability The confidence (expressed qualitatively) that data may be considered to be equivalent for each sampling and analytical event	Data sets from separate sampling episodes were required and issues of comparability were reduced through adherence to SOPs and regulator-endorsed or published guidelines and standards on each data gathering activity. In addition the data were collected by experienced samplers and NATA-accredited laboratory methodologies will be employed.

5.4 Sampling Rationale

With reference to the CSM described in **Section 4**, soil sampling work was planned in accordance with the following rationale:

- Sampling fill and natural soils from ten borehole locations across accessible parts of the site, to characterise *in situ* soils; and
- Laboratory analysis of representative soil samples for the COPCs.

5.5 Assessment Criteria

The assessment criteria adopted for this ASI are outlined in **Table 5-3**. These were selected from available published guidelines that are endorsed by national or state regulatory authorities, with due consideration of the exposure scenarios that are expected for various parts of the site, the likely exposure pathways, and the identified potential receptors.

For the purposes of this ASI, the adopted soil assessment criteria are referred to as the *Soil Investigation Levels* (SILs).

Table 5-3 Adopted Investigation Levels for Soil

Medium	Guidelines	Rationale
Soil	NEPC (2013) HILs, HSLs, EILs, ESLs and Management Limits for TRH	**Soil Health-based Investigation Levels (HILs)** NEPC (2013) *HIL-A* thresholds for residential with garden/accessible soil settings. **Soil Health-based Screening Levels (HSLs)** NEPC (2013) *HSL-A & B* thresholds for vapour intrusion at residential sites were applied to assess potential human health impacts from residual vapours resulting from petroleum, BTEX and naphthalene (per Section 2.4.8 Schedule B1 NEPC 2013). For asbestos in soil, the following criteria were applicable: ▪ Bonded ACM - HSL-A; ▪ Friable Asbestos: 0.001% w/w in all areas of the site; ▪ No visible asbestos on soil surface in all areas of the site. **Management Limits for Petroleum Hydrocarbons** Where the HSLs and ESLs for petroleum hydrocarbons were exceeded, sample results were also assessed against the NEPC (2013) *Management Limits* for the F1-F4 TRH fractions, to assess propensity for phase-separated hydrocarbons (PSH), fire and explosive hazards and adverse effects on buried infrastructure.

5.6 Soil Sampling

The soil sampling works conducted at the site are described in **Table 5-4**. Sampling locations are illustrated in **Figure 2**, **Appendix A**.

Table 5-4 Summary of Soil Sampling Methodology

Activity/Item	Details
Fieldwork	Intrusive soil investigations were conducted on 14 February 2022, and comprised 10 borehole locations.
Investigation Method	All Test bores were drilled using a ute-mounted drill rig, fitted with solid flight augers. Borehole details are presented in the detailed logs attached in **Appendix E**.
Soil Logging	Drilled soils were classified in the field with respect to lithological characteristics and evaluated on a qualitative basis for odour and visual signs of contamination. Soil

Activity/Item	Details
	classifications and descriptions were based on Australian Standard (AS) 1726-2017. Borehole logs are presented in **Appendix E**.
Soil Sampling	Soil samples were collected using a dry grab method (the sampler wearing unused, dedicated nitrile gloves) and placed into laboratory-supplied, acid-washed, solvent-rinsed glass jars, or snap-lock, plastic bags. Blind and split field duplicates were separated from the primary samples and placed into dedicated glass jars. At each location, aliquots of soil were placed into separate zip-lock bags for laboratory asbestos analysis and in-field VOC screening by a PID.
Soil Vapour Screening	Screening for VOC in soil headspace samples was conducted using a pre-calibrated PID with a 10.6mV ionisation lamp.
Decontamination	Nitrile sampling gloves were replaced between each sampling location. Augers were cleaned of all residual soil between each borehole location.
Management of Soil Cuttings	Soil cuttings were used as backfill for completed boreholes.
Sample Preservation and Transport	Samples were stored in a chilled chest (with frozen ice packs), whilst on-site and in transit to the contracted laboratories. Soil samples were transported to SGS Australia Pty Ltd (SGS; the primary laboratory) under strict chain-of-custody (COC) conditions. Signed COC certificates and sample receipt advice (SRA) were provided by SGS for confirmation purposes (**Appendix G**). Split (inter-laboratory) soil field duplicates were submitted to Envirolab Services Pty Ltd (Envirolab; the secondary laboratory) under strict COC conditions. Signed COC forms and SRA were provided by Envirolab for confirmation purposes (**Appendix G**).
Laboratory Analysis and Quality Control	Soil samples were analysed by SGS and Envirolab for the COPC. All samples were analysed within the required holding period, as documented in the corresponding laboratory reports (**Appendix H**). In addition to the split (inter-laboratory) field duplicate (QT1; analysed by Envirolab), QC testing comprised one blind (intra-laboratory) field duplicate (QD1), an equipment rinsate blank, a laboratory-prepared trip spike soil sample and a laboratory-prepared trip blank soil sample, all analysed by SGS.

6. DATA QUALITY ASSESSMENT

The assessment of data quality is defined as the scientific and statistical evaluation of environmental results to determine if they meet the objectives of the project (USEPA, 2006). For this ASI, data quality assessment involved an evaluation of the compliance of the field (sampling) and laboratory procedures with established protocols, as well as the accuracy and precision of the associated results from the quality control measures. The findings are summarised in **Table 6-1** and discussed in detail in **Appendix I**.

In summary, the overall quality of the analytical data from this ASI was considered to be of an acceptable standard for interpretive use and preparation of an updated CSM.

Table 6-1 Quality Control Process

Stage	Control	Conformance [Yes, Part, No]	Report Section(s)
Preliminaries	DQO established	Yes	See DQO/DQI, **Section 5.2** and **5.3**
Field work	Suitable documentation of fieldwork observations including borehole logs, field notes.	Yes	See **Appendix E** and **F**
Sampling plan	Use of relevant and appropriate sampling plan (density, type, and location)	Yes	See sample rationale **Section 5.4**
	All media sampled and duplicates collected	Yes	See **Appendix G**
	Use of approved and appropriate sampling methods (soil, groundwater, soil vapour)	Yes	See **Section 5.6** and **5.7**
	Selection of soil samples according to field PID readings (where VOCs are present)	Yes	See **Section 7** and **Appendix E**
	Preservation and storage of samples upon collection and during transport to the laboratory	Yes	See **Section 5.6** and **5.7**
	Appropriate field rinsate and trip blanks taken	Yes	See **Appendix G**
	Completed field and analytical laboratory sample COC procedures and documentation	Yes	See **Appendix G**
Laboratory	Sample holding times within acceptable limits	Yes	See laboratory QA/QC, **Appendix H, I, J**
	Use of appropriate analytical procedures and NATA-accredited laboratories	Yes	See laboratory QA/QC, **Appendix H, I, J**
	LOR/PQL low enough to meet adopted criteria	Yes	See laboratory QA/QC, **Appendix H, I, J**
	Laboratory blanks	Yes	See laboratory QA/QC, **Appendix H, I, J**
	Laboratory duplicates	Yes	See laboratory QA/QC, **Appendix H, I, J**
	Matrix spike/matrix spike duplicates	Yes	See laboratory QA/QC, **Appendix H, I, J**
	Surrogates (or System Monitoring Compounds)	Yes	See laboratory QA/QC, **Appendix H, I, J**

Stage	Control	Conformance [Yes, Part, No]	Report Section(s)
	Analytical results for replicated samples, including field and laboratory duplicates and inter-laboratory duplicates, expressed as Relative Percentage Difference (RPD)	Yes	See laboratory QA/QC, **Appendix H, I, J**
	Checking for the occurrence of apparently unusual or anomalous results (e.g. laboratory results that appear to be inconsistent with field observations or measurements)	Yes	See **Appendix B, E, F**
Reporting	Report reviewed by senior staff to assess project meets desired quality, EPA guidelines and project outcomes.	Yes	See Document Control

7. RESULTS

7.1 Soil Field Results

7.1.1 Sub-Surface Conditions

The general site lithology encountered during the soil investigations was a layer of silty sand / sand filling, overlying natural, clayey sand and clay. More details are provided in **Table 7-1** and borehole logs are presented in **Appendix E**.

Table 7-1 Generalised Sub-Surface Profile (mBGL)

Layer	Description	Minimum and Maximum Depth
Fill	Sand, coarse grained, poorly graded, medium to dark brown/light yellow to light brown, with gravels and trace roots, ash, brick, sandstone	0.0-1.0
	Silty sand; coarse grained, dark grey/light grey to medium brown, with gravels, trace of roots and brick.	0.0-0.4
Natural	Clayey SAND/Clay	0.2-1.5+

Note 1 + Termination depth of deepest borehole.

7.1.2 Field Observations and PID Results

Soil samples were obtained from the test bores at various depths ranging between 0.1-1.5m BGL. All examined soil samples were evaluated on a qualitative basis for odour and visual signs of contamination (e.g. hydrocarbon odours, oil staining, petrochemical filming, asbestos fragments, ash, charcoal) and the following observations were noted:

- No fragments of potential asbestos containing materials (ACM) were observed in any of the drilled/examined soil; and
- PID readings from collected soil headspace samples were generally low, ranging between 0.1-4.3 ppm (**Appendix E**).

7.2 Laboratory Analytical Results

Summary of the soil analytical results is presented in **Table 7-2**. More detailed tabulation is presented in **Table T-1** (**Appendix B**). Test results from previous PSI (DP, 2004) were also tabulated in the **Table T-1**.

Table 7-2 Summary of Soil Analytical Results

Number of Primary Samples	Analyte	Minimum Concentration (mg/kg)	Maximum Concentration (mg/kg)	Samples Exceeding SILs
Priority Metals				
11	Arsenic	<1	8	None
11	Cadmium	<0.3	0.6	None
11	Chromium (Total)	4.1	11	None
11	Copper	1.3	20	None
11	Lead	7	68	None
11	Mercury	<0.05	0.13	None
11	Nickel	0.6	32	None
11	Zinc	11	180	None
PAH				
11	Naphthalene	<0.1	<0.1	None
11	Benzo(a)pyrene	0.2	0.7	None
11	Carcinogenic PAH (as B(a)P TEQ)	<0.3	1.1	None
11	Total PAH	<0.8	5.7	None
BTEX				
11	Benzene	<0.1	<0.1	None
11	Toluene	<0.1	<0.1	None
11	Ethyl benzene	<0.1	<0.1	None
11	Xylenes (Total)	<0.3	<0.3	None
TRH				
11	F1	<25	150	None
11	F2	<25	660	None
11	F3	<90	200	None
11	F4	<120	160	None
Pesticides				
11	OCP	<1	<1	None
11	OPP	<1.7	<1.7	None
PCB				
11	Total PCB	<1	<1	None
Asbestos				
11	Asbestos	Not detected	Not detected	None

8. SITE CHARACTERISATION

8.1 Subsurface Conditions

Based on the borehole logs (BH101-BH110), the site lithology was generalised as a layer of sandy filling (max. depth of 1m), overlying natural clayey sand and clay.

8.2 Soil Impacts

Analytical results for the COPCs in representative fill and natural soil samples were all found to comply with the adopted SILs applicable to residential with garden/accessible soil settings.

- Concentrations of priority metals were low. Adopted health and ecological based criteria were not exceeded.
- No BTEX or TRHs were detected.
- Minor concentrations of PAHs were reported in fill at BH101, BH103, BH105 and BH107; however adopted health based were not exceeded.
- No OCPs, OPPs or PCBs were detected.
- Asbestos was not identified in any of the examined / analysed soils, nor observed on the ground surface during the site inspection and field work.

8.3 Preliminary Waste Classification

Preliminary waste classification was conducted during this investigation. Based on available analytical results, the fill soil across the site can be classified as General Solid Waste (non-putrescible) for offsite disposal purposes for offsite disposal purposes. The concentrations were less than the CT1 criteria and therefore can potentially be received as GSW-recyclable at an EPA licensed waste facility with prior approval by the facility. This information is for the purpose of development planning and does not constitute a formal waste classification certificate, as required by the NSW Waste Regulations 2014. Tabulated data can be found in **Appendix B**.

Based on the analytical results and borehole logs, a summary of resulting preliminary waste classifications and estimated volumes is provided in **Table 8-1**. It should be noted that further sampling following demolition will be required to confirm these classifications.

Table 8-1 Preliminary Waste Classification Summary

Material	Estimated Volume (m^3)	Estimated Tonnage (t)	Preliminary Waste Classification	Likely Disposal Options
General site fill	6,018	9,628.8	General Solid Waste (non-putrescible)	Recycling Facility
Natural materials	-	-	Virgin Excavated Natural Material (VENM)	VENM Tip

Note 1 Bulk density of 1.6t/m^3 for sand material.
Note 2 Fill volume was generally calculated by area of the site (1.02ha) and average depth of fill soil (0.59m) material.

8.4 Review of Conceptual Site Model

No significant levels of chemical contaminants were detected across the site. Previous data gaps have been largely addressed. However the current number of sampling locations (10 from EI, 3 from DP) did not meet the requirement of minimum sampling points for a site with size of 1.02 hectare (21 sampling points required). No samples were collected beneath the current site buildings.

9. CONCLUSION

The property located at 16 Macpherson St, Warriewood NSW was the subject of an Additional Site Investigation, which was conducted to assess the nature and degree of on-site contamination associated with current and former uses of the property. The key findings from this ASI were as follows:

- The site was occupied by a residential dwelling and a nursery;
- With reference to the Hornsby/Mona Vale Acid Sulfate Soil Risk Map (1:25,000 scale; Murphy, 1997), the site lies within the class description of 'Wa4 Low Probability, Greater than 3 meters below the ground surface '. The Pittwater Local Environmental Plan 2014 Acid Sulfate Soils Map (Sheet ASS_012) indicates that the site lies within a Class 4 risk area. In such cases, council consent is required prior to commencing any works more than 2 metres below the natural ground surface and works by which the watertable is likely to be lowered more than 2 metres below the natural ground surface. Given the nature of the proposed development, soil 2m below the current site levels will not be disturbed, as such management planning of acid sulfate soils is not required.
- No visible or olfactory signs of contamination were noted by EI field staff during the inspection, including fragments of fibre cement sheeting (FCS) on the site surfaces;
- Based on the borehole logs (BH101-BH110), the site lithology was generalised as a layer of silty sand / sand filling (up to 1m depth), overlying natural, clayey sand and clay;
- Contaminant concentrations in the soil samples were all below the adopted investigation levels applicable to residential with garden/accessible soil setting; and
- Based on the analytical results, the following preliminary was classifications were provided (with reference to the EPA (2014) *Waste Classification Guidelines*):
  - The fill materials on the site can be classified as *General Solid Waste* (non-putrescible); and
  - The underlying natural soils on the site can be classified as *Virgin Excavated Natural Material* (VENM).

Based on the findings from this ASI conducted in accordance with the investigation scope agreed with the Client, and with consideration of the Statement of Limitations (**Section 11**), EI concluded that the site can be made suitable for the proposed development, provided the recommendations detailed in **Section 10** are implemented.

10. RECOMMENDATIONS

EI makes the following recommendations in relation to the proposed development:

- Before commencement of any demolition, a Hazardous Materials Survey (HMS) should be completed by a suitably qualified hazardous materials consultant, to identify any hazardous materials present within the existing building fabrics.
    - If present, all identified hazardous materials must be appropriately managed, to maintain worker health and safety during demolition works and prevent the spread of hazardous substances;
    - An asbestos clearance inspection and certificate should be completed by a suitably qualified professional (SafeWork NSW Licensed Asbestos Assessor) following the removal of all ACM from the site (if identified); and
    - Where clearance inspection indicates the presence of hazardous materials remaining in or on soils at the site, further removal and clearance works should be undertaken;
- Additional eight (8) soils sampling locations will be required within the footprint of current site buildings following demolition to meet minimum number of sampling locations (EPA, 1995);
- A Remedial Action Plan (RAP) should be prepared and implemented if any contamination identified during supplementary sampling underneath the current site buildings. The RAP should provide details of the methodology and procedures;
- Any material being imported to the site to raise the site level should be validated as suitable for the intended use in accordance with EPA guidelines, including soils classified as Virgin Excavated Natural Material or Excavated Natural Material.

11. STATEMENT OF LIMITATIONS

This report has been prepared for the exclusive use of Warrimac Pty Ltd c/- IPM Developments Pty Ltd, whom is the only intended beneficiary of EI's work. The scope of the investigation carried out for the purpose of this report was limited to that agreed with Warrimac Pty Ltd c/- IPM Developments Pty Ltd.

No other party should rely on this document without the prior written consent of EI, and EI undertakes no duty, or accepts any responsibility or liability, to any third party who purports to rely upon this document without EI's approval.

The findings presented in this report are the result of discrete and specific sampling methodologies used in accordance with best industry practices and standards. Due to the site-specific nature of soil sampling from point locations, it is considered likely that all variations in subsurface conditions across a site cannot be fully defined, no matter how comprehensive the field program.

While normal assessments of data reliability have been made, EI assumes no responsibility or liability for errors in any data obtained from previous assessments conducted on site, regulatory agencies (e.g. Council, EPA), statements from sources outside of EI, or developments resulting from situations outside the scope of works of this project.

Despite all reasonable care and diligence, the ground conditions encountered and concentrations of contaminants measured may not be representative of conditions between the locations sampled and investigated. In addition, site characteristics may change at any time in response to variations in natural conditions, chemical reactions and other events (e.g. groundwater movement and or spillages of contaminating substances). These changes may occur subsequent to EI's investigation.

EI's assessment is necessarily based upon the results of the site investigation and the restricted program of surface and subsurface sampling, screening and chemical testing which was set out in the project proposal. Neither EI, nor any other reputable consultant, can provide unqualified warranties nor does EI assume any liability for site conditions not observed or accessible during the time of the investigations.

This report was prepared for Warrimac Pty Ltd c/- IPM Developments Pty Ltd and no responsibility is accepted for use of any part of this report in any other context or for any other purpose or by other third parties. This report does not purport to provide legal advice.

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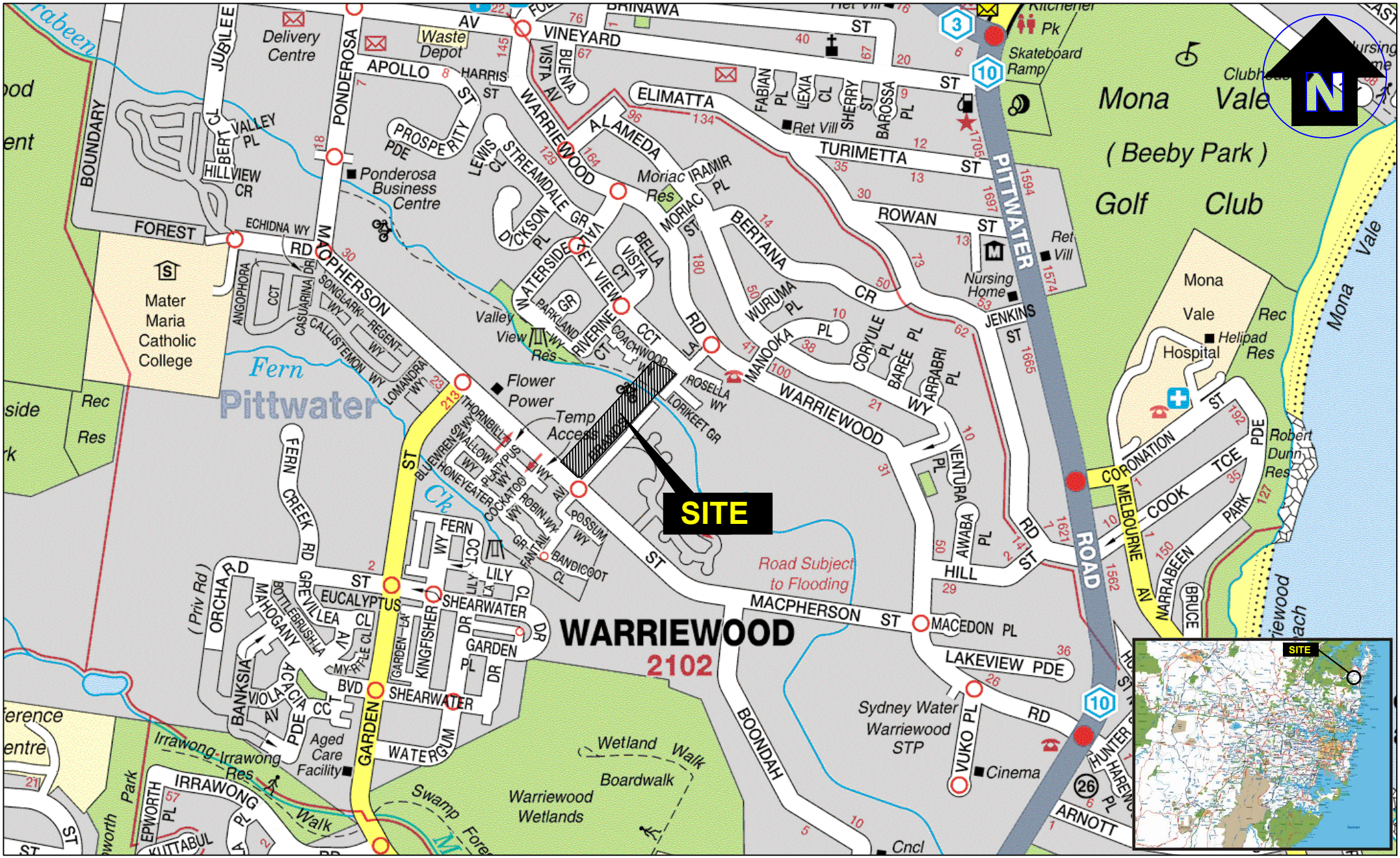
ABBREVIATIONS

ACM	Asbestos-Containing Materials
AHD	Australian Height Datum
ASS	Acid Sulfate Soils
AST	Above-ground Storage Tank
B(α)P	Benzo(α)Pyrene (a PAH compound)
BGL	Below Ground Level
BH	Borehole
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CCO	Chemical Control Order
COC	Chain of Custody
CSM	Conceptual Site Model
DA	Development Application
DBYD	Dial Before You Dig
DP	Deposited Plan
ASI	Additional Site Investigation
EI	EI Australia
EPA	Environment Protection Authority (of New South Wales)
F1	C_6-C_{10} TRH (less the sum of BTEX concentrations)
F2	>C_{10}-C_{16} TRH (less the concentration of naphthalene)
F3	TRH >C16-C34
F4	TRH >C34-C40
FCS	Fibre Cement Sheeting
GIPA	Government Information Public Access
GSW	General Solid Waste
HIL	Health-based Investigation Level
HSL	Health-based Screening Level
km	Kilometres
L	Litres
LEP	Local Environmental Plan
LGA	Local Government Area
LOR	Limit of Reporting (limit of reporting for respective laboratory method)
m	Metres
µg/L	Micrograms per Litre
mg/L	Milligrams per Litre
mV	Millivolts
N/A	Not Applicable
NATA	National Association of Testing Authorities, Australia
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
NSW	New South Wales
OCP	Organochlorine Pesticides
OPP	Organophosphate Pesticides
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
pH	Potential Hydrogen (a measure of the acidity or basicity of an aqueous solution)
PQL	Practical Quantitation Limit (limit of detection for respective laboratory method)
PSI	Preliminary Site Investigation
QA/QC	Quality Assurance / Quality Control
SAQP	Sampling and Analysis Quality Plan
SIL	Soil Investigation Level

SOP	Standard Operating Procedure
SRA	Sample Receipt Advice (document confirming laboratory receipt of samples)
TEQ	Toxicity Equivalent Quotient
TPH	Total Petroleum Hydrocarbons (superseded term equivalent to TRH)
TRH	Total Recoverable Hydrocarbons (non-specific analysis of organic compounds)
UCL	Upper Confidence Limit (of the mean)
UPSS	Underground Petroleum Storage System
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VENM	Virgin Excavated Natural Material

Appendix A – Figures



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Date:	23-02-22
Scale:	Not To Scale

IPM Property Pty Ltd
Additional Site Investigation
16 Macpherson St, Warriewood NSW

Site Locality Plan

Figure: 1

Project: E25541 E03_Rev0

LEGEND(All locations are approximate)

- Site boundary
- Borehole location
- Previous borehole location (DP, 2004)

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Date:	23-02-22

IPM Property Pty Ltd
Additional Site Investigation
16 Macpherson St, Warriewood NSW

Sampling Location Plan

Figure: 2

Project: E25541 E03_Rev0

Appendix B – Tables

Table T1 – Summary of Soil Test Results

Sample ID	Sampling Date	Metals								PAHs				BTEX				TRHs						Pesticides		Total PCBs	Asbestos
		As	Cd	Cr[#]	Cu	Pb	Hg	Ni	Zn	Carcinogenic PAHs (as B(a)P TEQ)	Benzo(a)pyrene	Total PAHs	Naphthalene	Benzene	Toluene	Ethylbenzene	Total Xylenes	F1	F2	F3	F4	C6-C9	C10-C36	OCPs	OPPs		Presence / absence
EI, 2022																											
BH101_0.2-0.4	14/02/2022	2	<0.3	8.4	7.4	24	0.09	2.5	46	0.6	0.3	3.3	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<20	<110	<1	<1.7	<1	No
BH102_0.3-0.4		3	<0.3	11	13	59	0.13	5.2	97	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<20	<110	<1	<1.7	<1	No
BH102_0.9-1.1		3	<0.3	10	1.5	14	<0.05	0.6	11	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<20	<110	<1	<1.7	<1	No
BH103_0.1-0.3		1	<0.3	4.5	7.6	26	<0.05	3.8	75	0.5	0.3	3.3	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<20	<110	<1	<1.7	<1	No
BH104_0.1-0.3		3	<0.3	8.3	17	20	0.06	32	38	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<20	<110	<1	<1.7	<1	No
BH105_0.3-0.5		<1	<0.3	4.8	3.4	68	<0.05	2.8	23	0.4	0.2	2.5	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<20	<110	<1	<1.7	<1	No
BH106_0.3-0.5		1	<0.3	4.1	1.4	7	<0.05	0.6	11	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<20	<110	<1	<1.7	<1	No
BH107_0.3-0.5		5	<0.3	6.6	1.3	13	<0.05	<0.5	15	1.1	0.7	5.7	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<20	<110	<1	<1.7	<1	No
BH108_0.1-0.2		8	0.6	6.9	20	41	0.06	2.7	180	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<20	<110	<1	<1.7	<1	No
BH109_0.2-0.4		2	<0.3	7.5	9.8	14	<0.05	7.7	44	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<20	<110	<1	<1.7	<1	No
BH110_0.2-0.4		7	<0.3	6.4	14	42	0.05	3.4	130	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<20	<110	<1	<1.7	<1	No
BH100_QD1		2	<0.3	9	7.4	22	<0.05	2.5	49	N.A.	N.A.	N.A.	N.A.	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<20	<110	N.A.	N.A.	N.A.	N.A.
BH100-QT1		<4	<0.4	9	9	26	<0.1	3	40	N.A.	N.A.	N.A.	N.A.	<0.2	<0.5	<1	<1	<25	<50	<100	<100	<25	<50	N.A.	N.A.	N.A.	N.A.
DP, 2004																											
13/0.4	–	4	<0.5	5	4	39	<0.05	0.5	26	NA	0.3	3.7	NA	<0.5	<0.5	<0.5	<0.5	NA	NA	NA	NA	<20	<120	<PQL	<PQL	<0.9	NA
14/0.1		<3	<0.5	3	2	26	<0.05	0.9	7	NA	<0.05	<PQL	NA	<0.5	<0.5	<0.5	<0.5	NA	NA	NA	NA	<20	<120	<PQL	<PQL	<0.9	NA
15/0-0.5		12	<0.5	8	14	16	<0.05	3	45	NA	<0.05	<PQL	NA	<0.5	<0.5	<0.5	<0.5	NA	NA	NA	NA	<20	<120	<PQL	<PQL	<0.9	NA
15/3.0		3	<0.5	12	8	12	<0.05	4	0.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
STATISTICAL SUMMARY																											
Maximum concentration		**12**	**0.6**	**12**	**20**	**68**	**0.13**	**32**	**180**	**1.1**	**0.7**	**5.7**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.3**	**<25**	**<25**	**<90**	**<120**	**<20**	**<110**	**<1**	**<1.7**	**<1**	No
NEPM (2013) Criteria																											
HIL A - *Residential with garden / accessible soil*		100	20	100 Cr(VI)	6,000	300	40	400	7,400	3		300												240		1	
HSL A & B - Low to high density residential Soil texture classification – Clay		Source depths (0 m to <1 m. BGL)											5	0.7	480	NL	110	50	280								
		Source depths (1 m to <2 m. BGL)											NL	1	NL	NL	310	90	NL								
		Source depths (2 m to <4 m. BGL)											NL	2	NL	NL	NL	150	NL								
		Source depths (4 m + BGL)											NL	3	NL	NL	NL	290	NL								
EILs / ESLs Urban residential and public open space [1] [2]		100		198	150	1,100		170	370		0.7		170	65	105	125	45	180	120	1,300	5,600			180			
NSW EPA (2014) Waste Classification Criteria																											
General Soild Waste	CT1 (mg/kg)	100	20	100		100	4	40			0.8	200		10	288	600	1,000					650	10000	<50	250	<50	If detected material is Special Waste - Asbestos Waste
	TCLP1 (mg/L) / SCC1 (mg/kg)	5 / 500	1 / 100	5 / 1,900		5 / 1,500	0.2 / 50	2 / 1,050			0.04 / 10	NR / 200		0.5 / 18	14.4 / 518	30 / 1,080	50 / 1,800					NR/650	NR/10000	NR / <50	NR / 250	NR / <50	
Restricted Solid Waste	CT2 (mg/kg)	400	80	400		400	16	160			3.2	800		40	1,152	2,400	4,000					2600	40000	NR	1,000	NR	
	TCLP2 (mg/L) / SCC2 (mg/kg)	20 / 2,000	4 / 400	20 / 7,600		20 / 6,000	0.8 / 200	8 / 4,200			0.16 / 23	NR / 800		2 / 72	57.6 / 2,073	120 / 4,320	200 / 7,200					NR/2600	NR/40000	NR / <50	NR / 1,000	NR / <50	
Special Waste / Scheduled Waste																								> 2 mg/kg - Scheduled		> 2 mg/kg - PCB Waste [4]	

Notes:

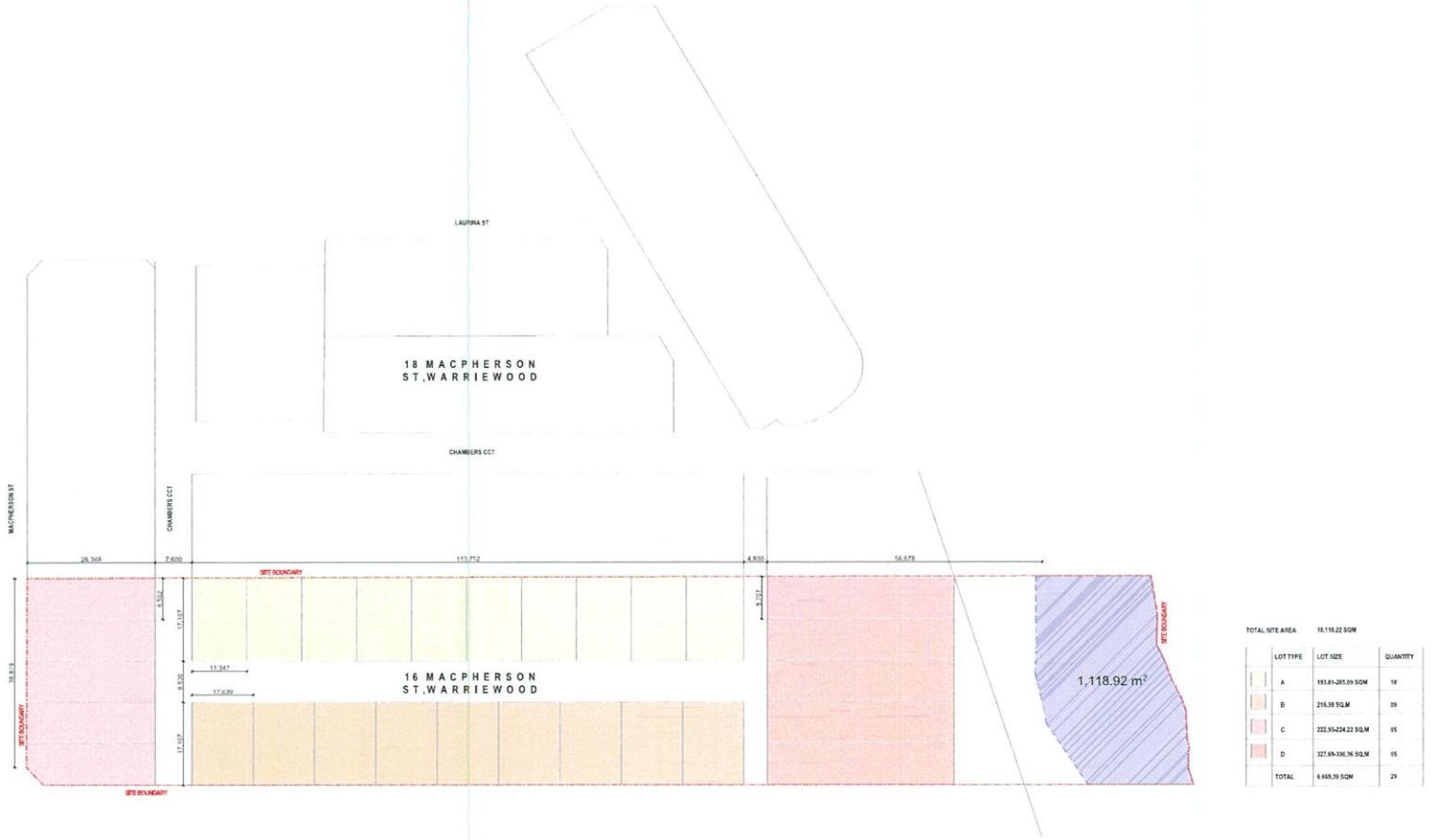
Highlighted values exceed HIL / HSL

Highlighted values exceed EILs and ESLs

Results are recorded in mg/kg

HIL A	NEPC 1999 Amendment 2013 'HIL A' - Health based Residential with garden / accessible soil, also includes children's day care centres, preschools and primary schools.
HSL A & B	NEPC 1999 Amendment 2013 'HSL A & B' Health Based Screening Levels applicable for vapour intrusion values applicable for low-high density residential settings.
#	Thresholds are for Chromium VI.
NA	Not analysed
NL	Not Limiting' If the derived soil vapour limit exceeds the soil concentration at which the pore water phase cannot dissolve any more of the individual chemical
NC	Not calculated
1	As strata is predominantly clay, fine grained soil assessment criteria values were applied.
2	EIL criteria is derived from a site specific Added Contaminant Limit (ACL) with the Ambient Background Concentration (ABC) for a high traffic NSW suburb.
3	NSW EPA Scheduled Chemical Wastes Chemical Control Order 2004. Section 4.14
4	NSW EPA Polychlorinated Biphenyl (PCB) Chemical Control Order 1997. Where PCBs are reported at concentrations >2 mg/kg and <50 mg/kg, material is *non-scheduled PCB waste*. Where PCBs are reported at concentrations >50 mg/kg, material is *scheduled PCB waste*.
F1	To obtain F1 subtract the sum of BTEX concentrations from the C6-C10 fraction.
F2	To obtain F2 subtract naphthalene from the >C10-C16 fraction.
F3	(>C16-C34)
F4	(>C34-C40)

Appendix C – Proposed Development



TOTAL SITE AREA 10,110.22 SQM

	LOT TYPE	LOT SIZE	QUANTITY
	A	193.81-265.09 SQM	10
	B	216.39 SQ.M	09
	C	222.95-224.22 SQ.M	05
	D	327.69-336.36 SQ.M	05
	TOTAL	6,668.39 SQM	29

01 DRAFT SUBDIVISION PLAN
1:1000

IPM PROPERTY

BUREAU SRH
architecture

Appendix D – Site Photographs

Photograph 1: The residential dwelling at south portion of the site – facing north.

Photograph 2: GI garden shed at residential property – facing northeast.

Photograph 3: The unpaved car parking within the nursery.

Photograph 4: Glasshouse and unpaved driveway within the nursery.

Photograph 5: Nursery office building and unpaved driveway within the nursery.

Photograph 6: Fibro-cement wall material on the glasshouse.

Photograph 7: Driveway and car park at northern portion of the site.

Photograph 8: Unpaved driveway to the east side of the glasshouse

Appendix E – Borehole Logs

BOREHOLE: BH101

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Project	Additional Site Investigation			Sheet	1 OF 1
Location	16 Macpherson St, Warriewood NSW			Date Started	14/2/22
Position	Refer to Figure 2			Date Completed	14/2/22
Job No.	E25541.E03	Contractor	Hartgeo Drilling Pty Ltd	Logged	TZ
Client	IPM Developments Pty Ltd	Drill Rig	UTE-Mounted Drilling Rig	Checked	EW
		Inclination	-90°		

Drilling					Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	-	GWNE	0.0					-	FILL: SAND; coarse grained, poorly graded, medium to dark brown, with gravels and trace roots, with trace ash, no odour.			FILL
					BH101_0.2-0.4 0.20-0.40 m PID=0.8ppm							
			0.5									
				0.60				SC	Clayey SAND; fine to medium grained, poorly graded, dark grey, no odour.	M	-	NATURAL
					BH101_0.8-1.0 0.80-1.00 m PID=0.3ppm							
			1.0									
				1.10				CI-CH	CLAY; medium to high plasticity, medium to dark grey, no odour.			
					BH101_1.3-1.5 1.30-1.50 m PID=0.7ppm							
			1.5	1.50					Hole Terminated at 1.50 mBGL; Target depth reached.			
			2.0									

This borehole log should be read in conjunction with EI Australia's accompanying standard notes.

BOREHOLE: BH102

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Project	Additional Site Investigation			Sheet	1 OF 1
Location	16 Macpherson St, Warriewood NSW			Date Started	14/2/22
Position	Refer to Figure 2			Date Completed	14/2/22
Job No.	E25541.E03	Contractor	Hartgeo Drilling Pty Ltd	Logged	TZ
Client	IPM Developments Pty Ltd	Drill Rig	UTE-Mounted Drilling Rig	Checked	EW
		Inclination	-90°		

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	-	GWNE	0.0					-	FILL: Silty SAND; coarse grained, poorly graded, dark grey, with gravels, with trace roots and brick, no odour.	M	-	FILL
					BH102_0.2-0.4 0.20-0.40 m PID=1.1ppm							
				0.40				-	FILL: SAND; coarse grained, poorly graded, pale grey to medium brown mottled white, with trace sandstone, no odour.			
			0.5									
					BH102_0.9-1.1 0.90-1.10 m PID=1.7ppm							
			1.0									
				1.10				CI-CH	CLAY; medium to high plasticity, medium to dark grey, no odour.			NATURAL
					BH102_1.3-1.5 1.30-1.50 m PID=0.8ppm							
			1.5	*1.50*					Hole Terminated at 1.50 mBGL; Target depth reached.			
			2.0									

This borehole log should be read in conjunction with EI Australia's accompanying standard notes.

BOREHOLE: BH103

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Project	Additional Site Investigation			Sheet	1 OF 1
Location	16 Macpherson St, Warriewood NSW			Date Started	14/2/22
Position	Refer to Figure 2			Date Completed	14/2/22
Job No.	E25541.E03	Contractor	Hartgeo Drilling Pty Ltd	Logged	TZ
Client	IPM Developments Pty Ltd	Drill Rig	UTE-Mounted Drilling Rig	Checked	EW
		Inclination	-90°		

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	-	GWNE	0.0		BH103_0.1-0.3 0.10-0.30 m PID=0.3ppm			-	FILL: SAND; coarse grained, poorly graded, grey to brown, with gravels, with trace bricks and roots, no odour.			FILL
				0.30				SC	Clayey SAND; fine to medium grained, poorly graded, dark grey, no odour.			NATURAL
			0.5		BH103_0.6-0.8 0.60-0.80 m PID=0.7ppm					M	-	
				0.80				CI-CH	CLAY; medium to high plasticity, medium to dark grey, no odour.			
			1.0		BH103_1.3-1.5 1.30-1.50 m PID=0.1ppm							
			1.5	1.50					Hole Terminated at 1.50 mBGL; Target depth reached.			
			2.0									

This borehole log should be read in conjunction with EI Australia's accompanying standard notes.

BOREHOLE: BH104

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Project	Additional Site Investigation			Sheet	1 OF 1
Location	16 Macpherson St, Warriewood NSW			Date Started	14/2/22
Position	Refer to Figure 2			Date Completed	14/2/22
Job No.	E25541.E03	Contractor	Hartgeo Drilling Pty Ltd	Logged	TZ
Client	IPM Developments Pty Ltd	Drill Rig	UTE-Mounted Drilling Rig	Checked	EW
		Inclination	-90°		

Drilling					Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	-	GWNE	0.0		BH104_0.1-0.3 0.10-0.30 m PID=1.1ppm			-	FILL: SAND; medium to coarse grained, poorly graded, grey to brown, with gravels and trace roots, no odour.	M	-	FILL
			0.5		BH104_0.7-0.9 0.70-0.90 m PID=1.1ppm							
				0.90				CI-CH	CLAY; medium to high plasticity, medium to dark grey, no odour.			NATURAL
			1.0		BH104_1.3-1.5 1.30-1.50 m PID=2.3ppm							
			1.5	*1.50*					Hole Terminated at 1.10 mBGL; Target depth reached.			
			2.0									

This borehole log should be read in conjunction with EI Australia's accompanying standard notes.

BOREHOLE: BH105

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Project	Additional Site Investigation			Sheet	1 OF 1
Location	16 Macpherson St, Warriewood NSW			Date Started	14/2/22
Position	Refer to Figure 2			Date Completed	14/2/22
Job No.	E25541.E03	Contractor	Hartgeo Drilling Pty Ltd	Logged	TZ
Client	IPM Developments Pty Ltd	Drill Rig	UTE-Mounted Drilling Rig	Checked	EW
		Inclination	-90°		

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	-	GWNE	0.0		BH105_0.3-0.5 0.30-0.50 m PID=0.3ppm			-	FILL: SAND; coarse grained, poorly graded, light grey to medium brown, with sandstone and trace brick, no odour.	M	-	FILL
			0.5	0.50				SC	Clayey SAND; fine to medium grained, poorly graded, dark grey, no odour.			NATURAL
			1.0		BH105_1.0-1.2 1.00-1.20 m PID=1.1ppm							
				1.30	BH105_1.3-1.5 1.30-1.50 m PID=1.7ppm			CI-CH	CLAY; medium to high plasticity, medium to dark grey, no odour.			
			1.5	1.50					Hole Terminated at 1.50 mBGL; Target depth reached.			
			2.0									

This borehole log should be read in conjunction with EI Australia's accompanying standard notes.

BOREHOLE: BH106

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Project	Additional Site Investigation			Sheet	1 OF 1
Location	16 Macpherson St, Warriewood NSW			Date Started	14/2/22
Position	Refer to Figure 2			Date Completed	14/2/22
Job No.	E25541.E03	Contractor	Hartgeo Drilling Pty Ltd	Logged	TZ
Client	IPM Developments Pty Ltd	Drill Rig	UTE-Mounted Drilling Rig	Checked	EW
		Inclination	-90°		

Drilling					Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	-	GWNE	0.0					-	FILL: SAND; medium grained, poorly graded, light yellow to light brown, with trace gravels, no odour.	M	-	FILL
					BH106_0.3-0.5 0.30-0.50 m PID=1.1ppm							
			0.5	0.50				-	FILL: Sandy SILT; poorly graded, dark grey, grey, with trace roots and trace plastic and brick, no odour.			
					BH106_0.8-1.0 0.80-1.00 m PID=4.3ppm							
			1.0	1.00				SC	Clayey SAND; fine to medium grained, poorly graded, dark grey, no odour.			NATURAL
					BH106_1.3-1.5 1.30-1.50 m PID=1.3ppm							
			1.5	1.50					Hole Terminated at 1.50 mBGL; Target depth reached.			
			2.0									

This borehole log should be read in conjunction with EI Australia's accompanying standard notes.

BOREHOLE: BH107

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Project	Additional Site Investigation			Sheet	1 OF 1
Location	16 Macpherson St, Warriewood NSW			Date Started	14/2/22
Position	Refer to Figure 2			Date Completed	14/2/22
Job No.	E25541.E03	Contractor	Hartgeo Drilling Pty Ltd	Logged	TZ
Client	IPM Developments Pty Ltd	Drill Rig	UTE-Mounted Drilling Rig	Checked	EW
		Inclination	-90°		

Drilling					Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	*DEPTH* RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	-	GWNE	0.0					-	FILL: SAND; coarse grained, poorly graded, light grey to medium brown, with sandstone and trace brick, no odour.			FILL
					BH107_0.3-0.5 0.30-0.50 m PID=1.6ppm							
			0.5	*0.50*				SC	Clayey SAND; fine to medium grained, poorly graded, dark grey, no odour.	M	-	NATURAL
			1.0		BH107_1.0-1.2 1.00-1.20 m PID=1.8ppm							
			1.5	*1.50*					Hole Terminated at 1.50 mBGL; Target depth reached.			
			2.0									

This borehole log should be read in conjunction with EI Australia's accompanying standard notes.

BOREHOLE: BH108

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Project	Additional Site Investigation			Sheet	1 OF 1
Location	16 Macpherson St, Warriewood NSW			Date Started	14/2/22
Position	Refer to Figure 2			Date Completed	14/2/22
Job No.	E25541.E03	Contractor	Hartgeo Drilling Pty Ltd	Logged	TZ
Client	IPM Developments Pty Ltd	Drill Rig	UTE-Mounted Drilling Rig	Checked	EW
		Inclination	-90°		

Drilling					Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	-	GWNE	0.0					-	FILL: SAND; coarse grained, poorly graded, light grey to medium brown, with sandstone and trace brick, no odour.			FILL
					BH108_0.1-0.3 0.10-0.30 m PID=0.3ppm							
				0.20				SC	Clayey SAND; fine to medium grained, poorly graded, dark grey, no odour.			NATURAL
			0.5							M	-	
					BH108_0.8-1.0 0.80-1.00 m PID=0.7ppm							
			1.0									
				1.20					Hole Terminated at 1.20 mBGL; Target depth reached.			
			1.5									
			2.0									

This borehole log should be read in conjunction with EI Australia's accompanying standard notes.

BOREHOLE: BH109

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Project	Additional Site Investigation			Sheet	1 OF 1
Location	16 Macpherson St, Warriewood NSW			Date Started	14/2/22
Position	Refer to Figure 2			Date Completed	14/2/22
Job No.	E25541.E03	Contractor	Hartgeo Drilling Pty Ltd	Logged	TZ
Client	IPM Developments Pty Ltd	Drill Rig	UTE-Mounted Drilling Rig	Checked	EW
		Inclination	-90°		

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	-	GWNE	0.0		BH109_0.2-0.4 0.20-0.40 m PID=0.3ppm			-	FILL: SAND; medium to coarse grained, poorly graded, grey to brown, with gravels and trace roots, no odour.			FILL
				0.40				SC	Clayey SAND; fine to medium grained, poorly graded, dark grey, no odour.			NATURAL
			0.5		BH109_0.5-0.7 0.50-0.70 m PID=0.1ppm							
				0.70				S	SAND; coarse grained, poorly graded, medium brown to orange, no odour.	M	-	
			1.0		BH109_1.3-1.5 1.30-1.50 m PID=0.7ppm							
			1.5	*1.50*					Hole Terminated at 1.50 mBGL; Target depth reached.			
			2.0									

This borehole log should be read in conjunction with EI Australia's accompanying standard notes.

BOREHOLE: BH110

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Project	Additional Site Investigation			Sheet	1 OF 1
Location	16 Macpherson St, Warriewood NSW			Date Started	14/2/22
Position	Refer to Figure 2			Date Completed	14/2/22
Job No.	E25541.E03	Contractor	Hartgeo Drilling Pty Ltd	Logged	TZ
Client	IPM Developments Pty Ltd	Drill Rig	UTE-Mounted Drilling Rig	Checked	EW
		Inclination	-90°		

Drilling					Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	-	GWNE	0.0					-	FILL: Silty SAND; medium grained, poorly graded, dark grey, with gravels, no odour.	M	-	FILL
					BH110_0.2-0.4 0.20-0.40 m PID=1.4ppm							
				0.40				SC	Clayey SAND; fine to medium grained, poorly graded, dark grey, no odour.			NATURAL
			0.5									
					BH110_0.8-1.0 0.80-1.00 m PID=0.8ppm							
				1.00				S	SAND; coarse grained, poorly graded, medium brown to orange, no odour.			
			1.0									
					BH110_1.3-1.5 1.30-1.50 m PID=2.1ppm							
				1.50					Hole Terminated at 1.50 mBGL; Target depth reached.			
			1.5									
			2.0									

This borehole log should be read in conjunction with EI Australia's accompanying standard notes.

Appendix F – Calibration Forms

EI Australia
Suite 6.01, 55 Miller Street
PYRMONT, NSW, 2009

ABN 33 102 449 507
E service@eiaustralia.com.au
W www.eiaustralia.com.au
T 02 9516 0722

CALIBRATION CERTIFICATE FOR PHOTO IONISATION DETECTOR

Instrument: Mini RAE 3000

Serial Number: 592-906667 - EI **PID02** ☒ **OR** 592-901345 - EI **PID03** ☐

Instrument Conditions: good

Calibration gas species: Isobutylene.

Calibration gas concentration: 100 ppm

Gas bottle number: Lot: 1435702 Cyl: 141

This PID has been calibrated to Isobutylene gas with the span concentration displayed as

100 ppm at 100 ppm span setting (allowable range +/-10ppm from span setting).

The PID is initially zero calibrated in fresh air.

Remaining gas in bottle: 250 psi (if reading is <250 psi, notify Equipment Manager to arrange new gas bottle order)

The above detector was calibrated in accordance with manufacturer's specifications.

Signed: _____

Date: 14/2/22

Time: 11:30 am

Appendix G – Chain of Custody and Sample Receipt Documentation

Sheet 1 of 3

Site: 16 Macpherson St, Warriewood

Project No: E25541

Laboratory: SGS Australia
Unit 16, 33 Maddox Street,
ALEXANDRIA NSW 2015
P: 02 8594 0400 F: 02 8594 0499

Sample ID	Laboratory ID	Container Type	Sampling Date	Sampling Time	Sample Matrix: SOIL	WATER	0.45 µm field filtered	OTHER	Analysis: HM ^A /TRH/BTEX/PAHs OCP/OP/PCB/Asbestos	HM ^A /TRH/BTEX/PAHs	HM ^A /TRH/BTEX	BTEX	VOCs	Asbestos	Asbestos Quantification	Excavated Natural Material (ENM) Suite	ENM Suite - Stockpile discrete (TRH/BTEX/PAHs)	ENM Suite - Stockpile composite (HM ^A /pH / EC / Foreign Materials)	Dewatering Suite	pH / pH peroxide	sPOCAS	Chromium Reducible Sulfur (CrS)	PFAS	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	Sulphate / Chloride	Lead	TCLP HM ^B / PAH
BH101-0.2-0.4	1	J&ZLB	14/2/22	am	X				X																			
BH101-0.8-1.0					X																							
BH101-1.3-1.5					X																							
BH102-0.2-0.4	2				X				X																			
BH102-0.9-1.1	3				X				X																			
BH102-1.3-1.5					X																							
BH103-0.1-0.3	4				X				X																			
BH103-0.6-0.8					X																							
BH103-1.3-1.5					X																							
BH104-0.1-0.3	5				X				X																			
BH104-0.7-0.9					X																							
BH104-1.3-1.5					X																							

SGS EHS Sydney COC
SE228926

Comments

HM ^A
Arsenic
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Zinc

HM ^B
Arsenic
Cadmium
Chromium
Lead
Mercury
Nickel

Dewatering Suite
pH & EC
TDS / TDU
Hardness
Total Cyanide
Metals (Al, As, Cd, Cr, Cu, Pb, Hg, Ni, Zn)
TRH (F1, F2, F3, F4)
BTEX
PAH
Total Phenol

LABORATORY TURNAROUND

- [x] Standard
- [ ] 24 Hours
- [ ] 48 Hours
- [ ] 72 Hours
- [ ] Other______

Container Type:
J = solvent washed, acid rinsed, Tefton sealed glass jar
S = solvent washed, acid rinsed glass bottle
P = natural HDPE plastic bottle
VC = glass vial, Tefton Septum
ZLB = Zip-Lock Bag BB = Bulk Bag

Investigator: I attest that these samples were collected in accordance with standard EI field sampling procedures.

Report with EI Waste Classification Table [X]

Sampler's Name (EI):	Received by (SGS):
Print Teh Zhang	Print M.Basaur
Signature [signed]	Signature [signed]
Date 14/2/22	Date 14.2.22 3:20

Sampler's Comments: -Please CC Emmanuel Wodders.

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Contamination | Remediation | Geotechnical

Suite 6.01, 55 Miller Street,
PYRMONT NSW 2009
Ph: 9516 0722
lab@eiaustralia.com.au

COC June 2021 FORM v.5 - SGS

IMPORTANT:
Please e-mail laboratory results to: lab@eiaustralia.com.au

Sheet 2 of 3

Site:	Project No:
16 Macpherson St, Warriewood	E25544

Laboratory: SGS Australia
Unit 16, 33 Maddox Street,
ALEXANDRIA NSW 2015
P: 02 8594 0400 F: 02 8594 0499

Sample ID	Laboratory ID	Container Type	Sampling Date	Sampling Time	Sample Matrix: SOIL	WATER	0.45 µm field filtered	OTHER	Analysis: HM [A] /TRH/BTEX/PAHs OCP/OP/PCB/Asbestos	HM [A] /TRH/BTEX/PAHs	HM [A] /TRH/BTEX	BTEX	VOCs	Asbestos	Asbestos Quantification	Excavated Natural Material (ENM) Suite	ENM Suite - Stockpile discrete (TRH/BTEX/PAHs)	ENM Suite - Stockpile composite (HM [A] /pH / EC / Foreign Materials)	Dewatering Suite	pH / pH peroxide	sPOCAS	Chromium Reducible Sulfur (CrS)	PFAS	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	Sulphate / Chloride	Lead	TCLP HM [B] / PAH
BH105-0.3-0.5	6	T&ZLB	14/2/22	P.m.	X				X																		
BH105-1.0-1.2					X																						
BH105-1.3-1.5					X																						
BH106-0.3-0.5	7				X				X																		
BH106-0.8-1.0					X																						
BH106-1.3-1.5					X																						
BH107-0.3-0.5	8				X				X																		
BH107-1.0-1.2					X																						
BH108-0.1-0.2	9				X				X																		
BH108-0.8-1.0					X																						
BH109-0.2-0.4	10				X				X																		
BH109-0.5-0.7					X																						

Comments

HM [A]
Arsenic
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Zinc

HM [B]
Arsenic
Cadmium
Chromium
Lead
Mercury
Nickel

Dewatering Suite
pH & EC
TDS / TDU
Hardness
Total Cyanide
Metals (Al, As, Cd, Cr, Cu, Pb, Hg, Ni, Zn)
TRH (F1, F2, F3, F4)
BTEX
PAH
Total Phenol

LABORATORY TURNAROUND
- [X] Standard
- [ ] 24 Hours
- [ ] 48 Hours
- [ ] 72 Hours
- [ ] Other____

Container Type:
J = solvent washed, acid rinsed, Tefton sealed glass jar
S = solvent washed, acid rinsed glass bottle
P = natural HDPE plastic bottle
VC = glass vial, Tefton Septum
ZLB = Zip-Lock Bag BB = Bulk Bag

Investigator: I attest that these samples were collected in accordance with standard EI field sampling procedures.

Report with EI Waste Classification Table [X]

Sampler's Name (EI):	Received by (SGS):	Sampler's Comments:
Print: Ted Zhang	Print: [illegible]	- Please CC Emmanuel Woolders.
Signature:	Signature:	
Date: 14/2/22	Date: 14.2.22 3:28	

IMPORTANT:
Please e-mail laboratory results to: lab@eiaustralia.com.au

eiaustralia
Contamination | Remediation | Geotechnical
Suite 6.01, 55 Miller Street,
PYRMONT NSW 2009
Ph: 9516 0722
lab@eiaustralia.com.au

Sheet 3 of 3

Site:	Project No:
16 Macpherson St, Warriewood.	E25541

Laboratory: SGS Australia
Unit 16, 33 Maddox Street,
ALEXANDRIA NSW 2015
P: 02 8594 0400 F: 02 8594 0499

Sample ID	Laboratory ID	Container Type	Sampling Date	Sampling Time	Sample Matrix: SOIL	WATER	0.45 µm field filtered	OTHER	Analysis: HM [A] /TRH/BTEX/PAHs OCP/OP/PCB/Asbestos	HM [A] /TRH/BTEX/PAHs	HM [A] /TRH/BTEX	BTEX	VOCs	Asbestos	Asbestos Quantification	Excavated Natural Material (ENM) Suite	ENM Suite - Stockpile discrete (TRH/BTEX/PAHs)	ENM Suite - Stockpile composite (HM [A] /pH / EC / Foreign Materials)	Dewatering Suite	pH / pH peroxide	sPOCAS	Chromium Reducible Sulfur (CrS)	PFAS	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	Sulphate / Chloride	Send to Envirolab for analysis	TCLP HM [B] / PAH
BH109-1.3-1.5		J,ZLB	14/2/22	p.m.	X																							
BH110-0.2-0.4	11	↓	↓	↓	X				X																			
BH110-0.8-1.0					X																							
BH110-1.3-1.5					X																							
BH109-QD1	12				X						X																	
BH109-QD2					X																							
BH109-QT1					X						X																X	
BH109-QT2		↓			X																							
BH109-TB	13	V			X							X																
BH109-TS	14	V			X							X																
BH109-RS	15	S,P,VC	↓	↓		X					X																	

Comments

HM [A]
Arsenic
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Zinc

HM [B]
Arsenic
Cadmium
Chromium
Lead
Mercury
Nickel

Dewatering Suite
pH & EC
TDS / TDU
Hardness
Total Cyanide
Metals (Al, As, Cd, Cr, Cu, Pb, Hg, Ni, Zn)
TRH (F1, F2, F3, F4)
BTEX
PAH
Total Phenol

LABORATORY TURNAROUND
- [X] Standard
- [ ] 24 Hours
- [ ] 48 Hours
- [ ] 72 Hours
- [ ] Other____

Container Type:
J = solvent washed, acid rinsed, Tefton sealed glass jar
S = solvent washed, acid rinsed glass bottle
P = natural HDPE plastic bottle
VC = glass vial, Tefton Septum
ZLB = Zip-Lock Bag BB = Bulk Bag

Investigator: I attest that these samples were collected in accordance with standard EI field sampling procedures.

Report with EI Waste Classification Table [X]

Sampler's Name (EI):	Received by (SGS):
Print: Ted Zhang	Print: M Bousaco7
Signature:	Signature:
Date: 14/2/22	Date: 14.2.22 3:20

Sampler's Comments:
- Please CC Emmanuel Wolters.
- Please send BH109-QT1 to Envirolab for selected analysis.

IMPORTANT:
Please e-mail laboratory results to: lab@eiaustralia.com.au

eiaustralia
Contamination | Remediation | Geotechnical
Suite 6.01, 55 Miller Street,
PYRMONT NSW 2009
Ph: 9516 0722
lab@eiaustralia.com.au

SAMPLE RECEIPT ADVICE

SE228926

CLIENT DETAILS

Contact	Emmanuel Woelders
Client	EI AUSTRALIA
Address	SUITE 6.01 55 MILLER STREET PYRMONT NSW 2009
Telephone	61 2 95160722
Facsimile	(Not specified)
Email	emmanuel.woelders@eiaustralia.com.au
Project	**E25541 16 Macpherson St. Warriewood**
Order Number	**E25541**
Samples	15

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
Samples Received	Mon 14/2/2022
Report Due	Mon 21/2/2022
SGS Reference	**SE228926**

SUBMISSION DETAILS

This is to confirm that 15 samples were received on Monday 14/2/2022. Results are expected to be ready by COB Monday 21/2/2022. Please quote SGS reference SE228926 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	14 Soil, 1 Water
Date documentation received	14/2/2022@3:20pm	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	8.0°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

Unless otherwise instructed, water and bulk samples will be held for one month from date of report, and soil samples will be held for two months.

COMMENTS

19 soil samples have been placed on hold as no tests have been assigned for them by the client. These samples will not be processed.

SAMPLE RECEIPT ADVICE

SE228926

CLIENT DETAILS

Client EI AUSTRALIA

Project E25541 16 Macpherson St. Warriewood

SUMMARY OF ANALYSIS

No.	Sample ID	OC Pesticides in Soil	OP Pesticides in Soil	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	PCBs in Soil	Total Recoverable Elements in Soil/Waste	TRH (Total Recoverable Hydrocarbons) in Soil	VOC's in Soil	Volatile Petroleum Hydrocarbons in Soil
001	BH101_0.2-0.4	30	14	26	11	7	10	11	7
002	BH102_0.3-0.4	30	14	26	11	7	10	11	7
003	BH102_0.9-1.1	30	14	26	11	7	10	11	7
004	BH103_0.1-0.3	30	14	26	11	7	10	11	7
005	BH104_0.1-0.3	30	14	26	11	7	10	11	7
006	BH105_0.3-0.5	30	14	26	11	7	10	11	7
007	BH106_0.3-0.5	30	14	26	11	7	10	11	7
008	BH107_0.3-0.5	30	14	26	11	7	10	11	7
009	BH108_0.1-0.2	30	14	26	11	7	10	11	7
010	BH109_0.2-0.4	30	14	26	11	7	10	11	7
011	BH110_0.2-0.4	30	14	26	11	7	10	11	7
012	BH100_QD1	-	-	-	-	7	10	11	7
013	BH100_TB	-	-	-	-	-	-	11	-
014	BH100_TS	-	-	-	-	-	-	11	-

CONTINUED OVERLEAF

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

SAMPLE RECEIPT ADVICE

SE228926

CLIENT DETAILS

Client EI AUSTRALIA

Project E25541 16 Macpherson St. Warriewood

SUMMARY OF ANALYSIS

No.	Sample ID	Fibre Identification in soil	Mercury in Soil	Moisture Content	VOCs in Water
001	BH101_0.2-0.4	2	1	1	-
002	BH102_0.3-0.4	2	1	1	-
003	BH102_0.9-1.1	2	1	1	-
004	BH103_0.1-0.3	2	1	1	-
005	BH104_0.1-0.3	2	1	1	-
006	BH105_0.3-0.5	2	1	1	-
007	BH106_0.3-0.5	2	1	1	-
008	BH107_0.3-0.5	2	1	1	-
009	BH108_0.1-0.2	2	1	1	-
010	BH109_0.2-0.4	2	1	1	-
011	BH110_0.2-0.4	2	1	1	-
012	BH100_QD1	-	1	1	-
013	BH100_TB	-	-	1	-
015	BH100_RS	-	-	-	11

CONTINUED OVERLEAF

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

SAMPLE RECEIPT ADVICE

SE228926

CLIENT DETAILS

Client EI AUSTRALIA

Project E25541 16 Macpherson St. Warriewood

SUMMARY OF ANALYSIS

No.	Sample ID	Mercury (dissolved) in Water	Trace Metals (Dissolved) in Water by ICPMS	TRH (Total Recoverable Hydrocarbons) in Water	Volatile Petroleum Hydrocarbons in Water
015	BH100_RS	1	7	9	7

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

Sheet 3 of 3

Site:	Project No:
16 Macpherson St, Warriewood.	E25541

Laboratory: SGS Australia
Unit 16, 33 Maddox Street,
ALEXANDRIA NSW 2015
P: 02 8594 0400 F: 02 8594 0499

Sample ID	Laboratory ID	Container Type	Sampling Date	Sampling Time	Sample Matrix: SOIL	WATER	0.45 µm field filtered	OTHER	Analysis: HM[A] /TRH/BTEX/PAHs OCP/OP/PCB/Asbestos	HM[A] /TRH/BTEX/PAHs	HM[A] /TRH/BTEX	BTEX	VOCs	Asbestos	Asbestos Quantification	Excavated Natural Material (ENM) Suite	ENM Suite - Stockpile discrete (TRH/BTEX/PAHs)	ENM Suite - Stockpile composite (HM[A] /pH / EC / Foreign Materials)	Dewatering Suite	pH / pH peroxide	sPOCAS	Chromium Reducible Sulfur (CrS)	PFAS	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	Sulphate / Chloride	Send to Envirolab for analysis	TCLP HM[B] / PAH
BH109-1.3-1.5		JR245	14/2/22	p.m.	X																							
BH110-0.2-0.4		↓	↓	↓	X				X																			
BH110-0.8-1.0					X																							
BH110-1.3-1.5					X																							
BH102-QD1					X						X																	
BH102-QD2					X																							
BH102-QT1	1				X						X																X	
BH102-QT2		↓			X																							
BH102-TB		V			X							X																
BH102-TS		V			X							X																
BH102-RS		S,P,VC	↓	↓		X					X																	

Environmental Services
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 289940

Date Received: 15-2-22
Time Received: 1410
Received by: TSH AW
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Comments

HM[A]
Arsenic
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Zinc

HM[B]
Arsenic
Cadmium
Chromium
Lead
Mercury
Nickel

Dewatering Suite
pH & EC
TDS / TDU
Hardness
Total Cyanide
Metals (Al, As, Cd, Cr, Cu, Pb, Hg, Ni, Zn)
TRH (F1, F2, F3, F4)
BTEX
PAH
Total Phenol

LABORATORY TURNAROUND

- [X] Standard
- [ ] 24 Hours
- [ ] 48 Hours
- [ ] 72 Hours
- [ ] Other____

Container Type:
J = solvent washed, acid rinsed, Tefton sealed glass jar
S = solvent washed, acid rinsed glass bottle
P = natural HDPE plastic bottle
VC = glass vial, Tefton Septum
ZLB = Zip-Lock Bag BB = Bulk Bag

Investigator: I attest that these samples were collected in accordance with standard EI field sampling procedures.

Report with EI Waste Classification Table [X]

Sampler's Name (EI):	Received by (SGS):
Print: Ted Zhang	Print: TSH AW
Signature:	Signature:
Date: 14/2/22	Date: 15-2-22 1410

Sampler's Comments:
- Please CC Emmanuel Walkers.
- Please send BH102-QT1 to Envirolab for selected analysis.

eiaustralia
Contamination | Remediation | Geotechnical

Suite 6.01, 55 Miller Street,
PYRMONT NSW 2009
Ph: 9516 0722
lab@eiaustralia.com.au

COC June 2021 FORM v5 - SGS

IMPORTANT:
Please e-mail laboratory results to: lab@eiaustralia.com.au

1410
13°C

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

SAMPLE RECEIPT ADVICE

Client Details

Client	EI Australia
Attention	Lab Email

Sample Login Details

Your reference	E25541, 16 Macpherson St, Warriewood
Envirolab Reference	288840
Date Sample Received	15/02/2022
Date Instructions Received	15/02/2022
Date Results Expected to be Reported	22/02/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	1 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	13
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

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

Analysis Underway, details on the following page:

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

Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	Acid Extractable metalsin soil
BH100-QT1	✓	✓	✓

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

Additional Info

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

Appendix H – Laboratory Analytical Reports

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Emmanuel Woelders
Client	EI AUSTRALIA
Address	SUITE 6.01 55 MILLER STREET PYRMONT NSW 2009
Telephone	61 2 95160722
Facsimile	(Not specified)
Email	emmanuel.woelders@eiaustralia.com.au
Project	**E25541 16 Macpherson St. Warriewood**
Order Number	**E25541**
Samples	15

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE228926 R0**
Date Received	14/2/2022
Date Reported	22/2/2022

COMMENTS

Accredited for compliance with ISO/IEC 17025 - Testing. NATA accredited laboratory 2562(4354).

No respirable fibres detected in all soil samples using trace analysis technique.

Asbestos analysed by Approved Identifier Yusuf Kuthpudin.

SIGNATORIES

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VOC's in Soil [AN433] Tested: 16/2/2022

PARAMETER	UOM	LOR	BH101_0.2-0.4 SOIL - 14/2/2022 SE228926.001	BH102_0.3-0.4 SOIL - 14/2/2022 SE228926.002	BH102_0.9-1.1 SOIL - 14/2/2022 SE228926.003	BH103_0.1-0.3 SOIL - 14/2/2022 SE228926.004	BH104_0.1-0.3 SOIL - 14/2/2022 SE228926.005
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Naphthalene (VOC)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

PARAMETER	UOM	LOR	BH105_0.3-0.5 SOIL - 14/2/2022 SE228926.006	BH106_0.3-0.5 SOIL - 14/2/2022 SE228926.007	BH107_0.3-0.5 SOIL - 14/2/2022 SE228926.008	BH108_0.1-0.2 SOIL - 14/2/2022 SE228926.009	BH109_0.2-0.4 SOIL - 14/2/2022 SE228926.010
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Naphthalene (VOC)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

PARAMETER	UOM	LOR	BH110_0.2-0.4 SOIL - 14/2/2022 SE228926.011	BH100_QD1 SOIL - 14/2/2022 SE228926.012	BH100_TB SOIL - 14/2/2022 SE228926.013	BH100_TS SOIL - 14/2/2022 SE228926.014
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	[93%]
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	[97%]
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	[99%]
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	[99%]
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	[100%]
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3	-
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6	-
Naphthalene (VOC)	mg/kg	0.1	<0.1	<0.1	<0.1	-

Volatile Petroleum Hydrocarbons in Soil [AN433] Tested: 16/2/2022

PARAMETER	UOM	LOR	BH101_0.2-0.4 SOIL - 14/2/2022 SE228926.001	BH102_0.3-0.4 SOIL - 14/2/2022 SE228926.002	BH102_0.9-1.1 SOIL - 14/2/2022 SE228926.003	BH103_0.1-0.3 SOIL - 14/2/2022 SE228926.004	BH104_0.1-0.3 SOIL - 14/2/2022 SE228926.005
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25

PARAMETER	UOM	LOR	BH105_0.3-0.5 SOIL - 14/2/2022 SE228926.006	BH106_0.3-0.5 SOIL - 14/2/2022 SE228926.007	BH107_0.3-0.5 SOIL - 14/2/2022 SE228926.008	BH108_0.1-0.2 SOIL - 14/2/2022 SE228926.009	BH109_0.2-0.4 SOIL - 14/2/2022 SE228926.010
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25

PARAMETER	UOM	LOR	BH110_0.2-0.4 SOIL - 14/2/2022 SE228926.011	BH100_QD1 SOIL - 14/2/2022 SE228926.012
TRH C6-C9	mg/kg	20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25

TRH (Total Recoverable Hydrocarbons) in Soil [AN403] Tested: 16/2/2022

PARAMETER	UOM	LOR	BH101_0.2-0.4 SOIL - 14/2/2022 SE228926.001	BH102_0.3-0.4 SOIL - 14/2/2022 SE228926.002	BH102_0.9-1.1 SOIL - 14/2/2022 SE228926.003	BH103_0.1-0.3 SOIL - 14/2/2022 SE228926.004	BH104_0.1-0.3 SOIL - 14/2/2022 SE228926.005
TRH C10-C14	mg/kg	20	<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45	<45	<45	<45
TRH C29-C36	mg/kg	45	<45	<45	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100	<100
TRH >C10-C16	mg/kg	25	<25	<25	<25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	<110	<110	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210	<210	<210

PARAMETER	UOM	LOR	BH105_0.3-0.5 SOIL - 14/2/2022 SE228926.006	BH106_0.3-0.5 SOIL - 14/2/2022 SE228926.007	BH107_0.3-0.5 SOIL - 14/2/2022 SE228926.008	BH108_0.1-0.2 SOIL - 14/2/2022 SE228926.009	BH109_0.2-0.4 SOIL - 14/2/2022 SE228926.010
TRH C10-C14	mg/kg	20	<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45	<45	<45	<45
TRH C29-C36	mg/kg	45	<45	<45	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100	<100
TRH >C10-C16	mg/kg	25	<25	<25	<25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	<110	<110	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210	<210	<210

PARAMETER	UOM	LOR	BH110_0.2-0.4 SOIL - 14/2/2022 SE228926.011	BH100_QD1 SOIL - 14/2/2022 SE228926.012
TRH C10-C14	mg/kg	20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45
TRH C29-C36	mg/kg	45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100
TRH >C10-C16	mg/kg	25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420] Tested: 16/2/2022

PARAMETER	UOM	LOR	BH101_0.2-0.4 SOIL - 14/2/2022 SE228926.001	BH102_0.3-0.4 SOIL - 14/2/2022 SE228926.002	BH102_0.9-1.1 SOIL - 14/2/2022 SE228926.003	BH103_0.1-0.3 SOIL - 14/2/2022 SE228926.004	BH104_0.1-0.3 SOIL - 14/2/2022 SE228926.005
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	0.2	<0.1	<0.1	0.3	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	0.6	0.2	<0.1	0.6	<0.1
Pyrene	mg/kg	0.1	0.6	0.2	<0.1	0.6	<0.1
Benzo(a)anthracene	mg/kg	0.1	0.4	<0.1	<0.1	0.3	<0.1
Chrysene	mg/kg	0.1	0.3	<0.1	<0.1	0.3	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	0.4	0.1	<0.1	0.4	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	0.2	<0.1	<0.1	0.2	<0.1
Benzo(a)pyrene	mg/kg	0.1	0.3	<0.1	<0.1	0.3	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	0.2	<0.1	<0.1	0.2	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	0.2	<0.1	<0.1	0.2	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	0.5	<0.2	<0.2	0.4	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	0.6	<0.3	<0.3	0.5	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	0.5	<0.2	<0.2	0.5	<0.2
Total PAH (18)	mg/kg	0.8	3.3	<0.8	<0.8	3.3	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	3.3	<0.8	<0.8	3.3	<0.8

PARAMETER	UOM	LOR	BH105_0.3-0.5 SOIL - 14/2/2022 SE228926.006	BH106_0.3-0.5 SOIL - 14/2/2022 SE228926.007	BH107_0.3-0.5 SOIL - 14/2/2022 SE228926.008	BH108_0.1-0.2 SOIL - 14/2/2022 SE228926.009	BH109_0.2-0.4 SOIL - 14/2/2022 SE228926.010
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	0.2	<0.1	0.1	<0.1	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	0.5	<0.1	0.8	<0.1	0.1
Pyrene	mg/kg	0.1	0.5	<0.1	1.0	<0.1	0.2
Benzo(a)anthracene	mg/kg	0.1	0.3	<0.1	0.6	<0.1	<0.1
Chrysene	mg/kg	0.1	0.2	<0.1	0.6	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	0.3	<0.1	0.7	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	0.1	<0.1	0.3	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	0.2	<0.1	0.7	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	0.1	<0.1	0.4	<0.1	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	0.1	<0.1	0.4	<0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	0.3	<0.2	1.0	<0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	0.4	<0.3	1.1	<0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	0.3	<0.2	1.0	<0.2	<0.2
Total PAH (18)	mg/kg	0.8	2.5	<0.8	5.7	<0.8	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	2.5	<0.8	5.7	<0.8	<0.8

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420] Tested: 16/2/2022 (continued)

PARAMETER	UOM	LOR	BH110_0.2-0.4 SOIL - 14/2/2022 SE228926.011
Naphthalene	mg/kg	0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1
Fluorene	mg/kg	0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1
Anthracene	mg/kg	0.1	<0.1
Fluoranthene	mg/kg	0.1	**0.1**
Pyrene	mg/kg	0.1	**0.1**
Benzo(a)anthracene	mg/kg	0.1	<0.1
Chrysene	mg/kg	0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2
Total PAH (18)	mg/kg	0.8	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	<0.8

OC Pesticides in Soil [AN420] Tested: 16/2/2022

PARAMETER	UOM	LOR	BH101_0.2-0.4 SOIL - 14/2/2022 SE228926.001	BH102_0.3-0.4 SOIL - 14/2/2022 SE228926.002	BH102_0.9-1.1 SOIL - 14/2/2022 SE228926.003	BH103_0.1-0.3 SOIL - 14/2/2022 SE228926.004	BH104_0.1-0.3 SOIL - 14/2/2022 SE228926.005
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	<1	<1	<1	<1	<1
Total OC VIC EPA	mg/kg	1	<1	<1	<1	<1	<1

OC Pesticides in Soil [AN420] Tested: 16/2/2022 (continued)

PARAMETER	UOM	LOR	BH105_0.3-0.5 SOIL - 14/2/2022 SE228926.006	BH106_0.3-0.5 SOIL - 14/2/2022 SE228926.007	BH107_0.3-0.5 SOIL - 14/2/2022 SE228926.008	BH108_0.1-0.2 SOIL - 14/2/2022 SE228926.009	BH109_0.2-0.4 SOIL - 14/2/2022 SE228926.010
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	**0.2**	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	<1	<1	<1	<1	<1
Total OC VIC EPA	mg/kg	1	<1	<1	<1	<1	<1

OC Pesticides in Soil [AN420] Tested: 16/2/2022 (continued)

PARAMETER	UOM	LOR	BH110_0.2-0.4 SOIL - 14/2/2022 SE228926.011
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1
Lindane	mg/kg	0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1
Aldrin	mg/kg	0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2
Endrin	mg/kg	0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1
Isodrin	mg/kg	0.1	<0.1
Mirex	mg/kg	0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	<1
Total OC VIC EPA	mg/kg	1	<1

OP Pesticides in Soil [AN420] Tested: 16/2/2022

PARAMETER	UOM	LOR	BH101_0.2-0.4 SOIL - 14/2/2022 SE228926.001	BH102_0.3-0.4 SOIL - 14/2/2022 SE228926.002	BH102_0.9-1.1 SOIL - 14/2/2022 SE228926.003	BH103_0.1-0.3 SOIL - 14/2/2022 SE228926.004	BH104_0.1-0.3 SOIL - 14/2/2022 SE228926.005
Dichlorvos	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	<1.7	<1.7	<1.7

PARAMETER	UOM	LOR	BH105_0.3-0.5 SOIL - 14/2/2022 SE228926.006	BH106_0.3-0.5 SOIL - 14/2/2022 SE228926.007	BH107_0.3-0.5 SOIL - 14/2/2022 SE228926.008	BH108_0.1-0.2 SOIL - 14/2/2022 SE228926.009	BH109_0.2-0.4 SOIL - 14/2/2022 SE228926.010
Dichlorvos	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	<1.7	<1.7	<1.7

PARAMETER	UOM	LOR	BH110_0.2-0.4 SOIL - 14/2/2022 SE228926.011
Dichlorvos	mg/kg	0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2
Malathion	mg/kg	0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2
Methidathion	mg/kg	0.5	<0.5
Ethion	mg/kg	0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2
Total OP Pesticides*	mg/kg	1.7	<1.7

PCBs in Soil [AN420] Tested: 16/2/2022

PARAMETER	UOM	LOR	BH101_0.2-0.4 SOIL - 14/2/2022 SE228926.001	BH102_0.3-0.4 SOIL - 14/2/2022 SE228926.002	BH102_0.9-1.1 SOIL - 14/2/2022 SE228926.003	BH103_0.1-0.3 SOIL - 14/2/2022 SE228926.004	BH104_0.1-0.3 SOIL - 14/2/2022 SE228926.005
Arochlor 1016	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1	<1	<1	<1	<1

PARAMETER	UOM	LOR	BH105_0.3-0.5 SOIL - 14/2/2022 SE228926.006	BH106_0.3-0.5 SOIL - 14/2/2022 SE228926.007	BH107_0.3-0.5 SOIL - 14/2/2022 SE228926.008	BH108_0.1-0.2 SOIL - 14/2/2022 SE228926.009	BH109_0.2-0.4 SOIL - 14/2/2022 SE228926.010
Arochlor 1016	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1	<1	<1	<1	<1

PARAMETER	UOM	LOR	BH110_0.2-0.4 SOIL - 14/2/2022 SE228926.011
Arochlor 1016	mg/kg	0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 18/2/2022

PARAMETER	UOM	LOR	BH101_0.2-0.4 SOIL - 14/2/2022 SE228926.001	BH102_0.3-0.4 SOIL - 14/2/2022 SE228926.002	BH102_0.9-1.1 SOIL - 14/2/2022 SE228926.003	BH103_0.1-0.3 SOIL - 14/2/2022 SE228926.004	BH104_0.1-0.3 SOIL - 14/2/2022 SE228926.005
Arsenic, As	mg/kg	1	2	3	3	1	3
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	8.4	11	10	4.5	8.3
Copper, Cu	mg/kg	0.5	7.4	13	1.5	7.6	17
Lead, Pb	mg/kg	1	24	59	14	26	20
Nickel, Ni	mg/kg	0.5	2.5	5.2	0.6	3.8	32
Zinc, Zn	mg/kg	2	46	97	11	75	38

PARAMETER	UOM	LOR	BH105_0.3-0.5 SOIL - 14/2/2022 SE228926.006	BH106_0.3-0.5 SOIL - 14/2/2022 SE228926.007	BH107_0.3-0.5 SOIL - 14/2/2022 SE228926.008	BH108_0.1-0.2 SOIL - 14/2/2022 SE228926.009	BH109_0.2-0.4 SOIL - 14/2/2022 SE228926.010
Arsenic, As	mg/kg	1	<1	1	5	8	2
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	0.6	<0.3
Chromium, Cr	mg/kg	0.5	4.8	4.1	6.6	6.9	7.5
Copper, Cu	mg/kg	0.5	3.4	1.4	1.3	20	9.8
Lead, Pb	mg/kg	1	68	7	13	41	14
Nickel, Ni	mg/kg	0.5	2.8	0.6	<0.5	2.7	7.7
Zinc, Zn	mg/kg	2	23	11	15	180	44

PARAMETER	UOM	LOR	BH110_0.2-0.4 SOIL - 14/2/2022 SE228926.011	BH100_QD1 SOIL - 14/2/2022 SE228926.012
Arsenic, As	mg/kg	1	7	2
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	6.4	9.0
Copper, Cu	mg/kg	0.5	14	7.4
Lead, Pb	mg/kg	1	42	22
Nickel, Ni	mg/kg	0.5	3.4	2.5
Zinc, Zn	mg/kg	2	130	49

Mercury in Soil [AN312] Tested: 18/2/2022

PARAMETER	UOM	LOR	BH101_0.2-0.4 SOIL - 14/2/2022 SE228926.001	BH102_0.3-0.4 SOIL - 14/2/2022 SE228926.002	BH102_0.9-1.1 SOIL - 14/2/2022 SE228926.003	BH103_0.1-0.3 SOIL - 14/2/2022 SE228926.004	BH104_0.1-0.3 SOIL - 14/2/2022 SE228926.005
Mercury	mg/kg	0.05	**0.09**	**0.13**	<0.05	<0.05	**0.06**

PARAMETER	UOM	LOR	BH105_0.3-0.5 SOIL - 14/2/2022 SE228926.006	BH106_0.3-0.5 SOIL - 14/2/2022 SE228926.007	BH107_0.3-0.5 SOIL - 14/2/2022 SE228926.008	BH108_0.1-0.2 SOIL - 14/2/2022 SE228926.009	BH109_0.2-0.4 SOIL - 14/2/2022 SE228926.010
Mercury	mg/kg	0.05	<0.05	<0.05	<0.05	**0.06**	<0.05

PARAMETER	UOM	LOR	BH110_0.2-0.4 SOIL - 14/2/2022 SE228926.011	BH100_QD1 SOIL - 14/2/2022 SE228926.012
Mercury	mg/kg	0.05	**0.05**	<0.05

Moisture Content [AN002] Tested: 17/2/2022

PARAMETER	UOM	LOR	BH101_0.2-0.4 SOIL - 14/2/2022 SE228926.001	BH102_0.3-0.4 SOIL - 14/2/2022 SE228926.002	BH102_0.9-1.1 SOIL - 14/2/2022 SE228926.003	BH103_0.1-0.3 SOIL - 14/2/2022 SE228926.004	BH104_0.1-0.3 SOIL - 14/2/2022 SE228926.005
% Moisture	%w/w	1	19.6	29.1	17.5	12.9	10.5

PARAMETER	UOM	LOR	BH105_0.3-0.5 SOIL - 14/2/2022 SE228926.006	BH106_0.3-0.5 SOIL - 14/2/2022 SE228926.007	BH107_0.3-0.5 SOIL - 14/2/2022 SE228926.008	BH108_0.1-0.2 SOIL - 14/2/2022 SE228926.009	BH109_0.2-0.4 SOIL - 14/2/2022 SE228926.010
% Moisture	%w/w	1	7.3	5.9	9.0	15.0	9.2

PARAMETER	UOM	LOR	BH110_0.2-0.4 SOIL - 14/2/2022 SE228926.011	BH100_QD1 SOIL - 14/2/2022 SE228926.012	BH100_TB SOIL - 14/2/2022 SE228926.013
% Moisture	%w/w	1	10.4	19.5	<1.0

Fibre Identification in soil [AN602] Tested: 18/2/2022

PARAMETER	UOM	LOR	BH101_0.2-0.4 SOIL - 14/2/2022 SE228926.001	BH102_0.3-0.4 SOIL - 14/2/2022 SE228926.002	BH102_0.9-1.1 SOIL - 14/2/2022 SE228926.003	BH103_0.1-0.3 SOIL - 14/2/2022 SE228926.004	BH104_0.1-0.3 SOIL - 14/2/2022 SE228926.005
Asbestos Detected	No unit	-	No	No	No	No	No
Estimated Fibres*	%w/w	0.01	<0.01	<0.01	<0.01	<0.01	<0.01

PARAMETER	UOM	LOR	BH105_0.3-0.5 SOIL - 14/2/2022 SE228926.006	BH106_0.3-0.5 SOIL - 14/2/2022 SE228926.007	BH107_0.3-0.5 SOIL - 14/2/2022 SE228926.008	BH108_0.1-0.2 SOIL - 14/2/2022 SE228926.009	BH109_0.2-0.4 SOIL - 14/2/2022 SE228926.010
Asbestos Detected	No unit	-	No	No	No	No	No
Estimated Fibres*	%w/w	0.01	<0.01	<0.01	<0.01	<0.01	<0.01

PARAMETER	UOM	LOR	BH110_0.2-0.4 SOIL - 14/2/2022 SE228926.011
Asbestos Detected	No unit	-	No
Estimated Fibres*	%w/w	0.01	<0.01

VOCs in Water [AN433] Tested: 17/2/2022

PARAMETER	UOM	LOR	BH100_RS WATER - 14/2/2022 SE228926.015
Benzene	µg/L	0.5	<0.5
Toluene	µg/L	0.5	<0.5
Ethylbenzene	µg/L	0.5	<0.5
m/p-xylene	µg/L	1	<1
o-xylene	µg/L	0.5	<0.5
Total Xylenes	µg/L	1.5	<1.5
Total BTEX	µg/L	3	<3
Naphthalene (VOC)	µg/L	0.5	<0.5

Volatile Petroleum Hydrocarbons in Water [AN433] Tested: 17/2/2022

PARAMETER	UOM	LOR	BH100_RS WATER - 14/2/2022 SE228926.015
TRH C6-C9	µg/L	40	<40
Benzene (F0)	µg/L	0.5	<0.5
TRH C6-C10	µg/L	50	<50
TRH C6-C10 minus BTEX (F1)	µg/L	50	<50

TRH (Total Recoverable Hydrocarbons) in Water [AN403] Tested: 17/2/2022

PARAMETER	UOM	LOR	BH100_RS WATER - 14/2/2022 SE228926.015
TRH C10-C14	µg/L	50	<50
TRH C15-C28	µg/L	200	<200
TRH C29-C36	µg/L	200	<200
TRH C37-C40	µg/L	200	<200
TRH >C10-C16	µg/L	60	<60
TRH >C10-C16 - Naphthalene (F2)	µg/L	60	<60
TRH >C16-C34 (F3)	µg/L	500	<500
TRH >C34-C40 (F4)	µg/L	500	<500
TRH C10-C40	µg/L	320	<320

Trace Metals (Dissolved) in Water by ICPMS [AN318] Tested: 16/2/2022

PARAMETER	UOM	LOR	BH100_RS WATER - 14/2/2022 SE228926.015
Arsenic, As	µg/L	1	<1
Cadmium, Cd	µg/L	0.1	<0.1
Chromium, Cr	µg/L	1	<1
Copper, Cu	µg/L	1	<1
Lead, Pb	µg/L	1	<1
Nickel, Ni	µg/L	1	<1
Zinc, Zn	µg/L	5	<5

Mercury (dissolved) in Water [AN311(Perth)/AN312] Tested: 17/2/2022

PARAMETER	UOM	LOR	BH100_RS WATER - 14/2/2022 SE228926.015
Mercury	mg/L	0.0001	<0.0001

METHOD	METHODOLOGY SUMMARY
AN002	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
AN020	Unpreserved water sample is filtered through a 0.45µm membrane filter and acidified with nitric acid similar to APHA3030B.
AN040/AN320	A portion of sample is digested with nitric acid to decompose organic matter and hydrochloric acid to complete the digestion of metals. The digest is then analysed by ICP OES with metals results reported on the dried sample basis. Based on USEPA method 200.8 and 6010C.
AN040	A portion of sample is digested with Nitric acid to decompose organic matter and Hydrochloric acid to complete the digestion of metals and then filtered for analysis by ASS or ICP as per USEPA Method 200.8.
AN311(Perth)/AN312	Mercury by Cold Vapour AAS in Waters: Mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500.
AN312	Mercury by Cold Vapour AAS in Soils: After digestion with nitric acid, hydrogen peroxide and hydrochloric acid, mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500
AN318	Determination of elements at trace level in waters by ICP-MS technique,, referenced to USEPA 6020B and USEPA 200.8 (5.4).
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the NEPM 1999 (2013), >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). F2 is reported directly and also corrected by subtracting Naphthalene (from VOC method AN433) where available.
AN403	Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Recoverable Hydrocarbons - Silica (TRH-Si) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents.
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependent on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.
AN420	(SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN420	SVOC Compounds: Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN433	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.
AN602	Qualitative identification of chrysotile, amosite and crocidolite in bulk samples by polarised light microscopy (PLM) in conjunction with dispersion staining (DS). AS4964 provides the basis for this document. Unequivocal identification of the asbestos minerals present is made by obtaining sufficient diagnostic `clues`, which provide a reasonable degree of certainty, dispersion staining is a mandatory `clue` for positive identification. If sufficient `clues` are absent, then positive identification of asbestos is not possible. This procedure requires removal of suspect fibres/bundles from the sample which cannot be returned.
AN602	Fibres/material that cannot be unequivocably identified as one of the three asbestos forms, will be reported as unknown mineral fibres (umf) The fibres detected may or may not be asbestos fibres.

AN602	AS4964.2004 Method for the Qualitative Identification of Asbestos in Bulk Samples, Section 8.4, Trace Analysis Criteria, Note 4 states:"Depending upon sample condition and fibre type, the detection/reporting limit (RL) of this technique has been found to lie generally in the range of 1 in 1,000 to 1 in 10,000 parts by weight, equivalent to 1 to 0.1 g/kg."
AN602	The sample can be reported “no asbestos found at the reporting limit (RL) of 0.1 g/kg” (<0.01%w/w) where AN602 section 4.5 of this method has been followed, and if- (a) no trace asbestos fibres have been detected (i.e. no ‘respirable’ fibres): (b) the estimated weight of non-respirable asbestos fibre bundles and/or the estimated weight of asbestos in asbestos-containing materials are found to be less than 0.1g/kg: and (c) these non-respirable asbestos fibre bundles and/or the asbestos containing materials are only visible under stereo-microscope viewing conditions.

FOOTNOTES

*	NATA accreditation does not cover the performance of this service.	-	Not analysed.	UOM	Unit of Measure.
**	Indicative data, theoretical holding time exceeded.	NVL	Not validated.	LOR	Limit of Reporting.
***	Indicates that both * and ** apply.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the " Total" LOR will be the sum of those two LORs.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.
Note that in terms of units of radioactivity:

a. 1 Bq is equivalent to 27 pCi
b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au/en-qb/environment-health-and-safety.

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Emmanuel Woelders
Client	EI AUSTRALIA
Address	SUITE 6.01 55 MILLER STREET PYRMONT NSW 2009
Telephone	61 2 95160722
Facsimile	(Not specified)
Email	emmanuel.woelders@eiaustralia.com.au
Project	**E25541 16 Macpherson St. Warriewood**
Order Number	**E25541**
Samples	11

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE228926 R0**
Date Received	14 Feb 2022
Date Reported	22 Feb 2022

COMMENTS

Accredited for compliance with ISO/IEC 17025 - Testing. NATA accredited laboratory 2562(4354).

No respirable fibres detected in all soil samples using trace analysis technique.

Asbestos analysed by Approved Identifier Yusuf Kuthpudin.

SIGNATORIES

Ravee SIVASUBRAMANIAM
Hygiene Team Leader

RESULTS

Fibre Identification in soil — Method AN602

Laboratory Reference	Client Reference	Matrix	Sample Description	Date Sampled	Fibre Identification	Est.%w/w*
SE228926.001	BH101_0.2-0.4	Soil	135g Clay,Sand,Soil, Rocks	14 Feb 2022	No Asbestos Found at RL of 0.1g/kg Organic Fibres Detected	<0.01
SE228926.002	BH102_0.3-0.4	Soil	143g Clay,Sand,Soil, Rocks	14 Feb 2022	No Asbestos Found at RL of 0.1g/kg Organic Fibres Detected	<0.01
SE228926.003	BH102_0.9-1.1	Soil	160g Clay,Sand,Rock s	14 Feb 2022	No Asbestos Found at RL of 0.1g/kg	<0.01
SE228926.004	BH103_0.1-0.3	Soil	176g Clay,Sand,Soil, Rocks	14 Feb 2022	No Asbestos Found at RL of 0.1g/kg Organic Fibres Detected	<0.01
SE228926.005	BH104_0.1-0.3	Soil	113g Clay,Sand,Soil, Rocks	14 Feb 2022	No Asbestos Found at RL of 0.1g/kg Organic Fibres Detected	<0.01
SE228926.006	BH105_0.3-0.5	Soil	178g Clay,Sand,Soil, Rocks	14 Feb 2022	No Asbestos Found at RL of 0.1g/kg	<0.01
SE228926.007	BH106_0.3-0.5	Soil	150g Sand,Rocks	14 Feb 2022	No Asbestos Found at RL of 0.1g/kg	<0.01
SE228926.008	BH107_0.3-0.5	Soil	195g Clay,Sand,Soil, Rocks	14 Feb 2022	No Asbestos Found at RL of 0.1g/kg	<0.01
SE228926.009	BH108_0.1-0.2	Soil	141g Sand,Soil,Rocks	14 Feb 2022	No Asbestos Found at RL of 0.1g/kg	<0.01
SE228926.010	BH109_0.2-0.4	Soil	132g Clay,Sand,Soil, Rocks	14 Feb 2022	No Asbestos Found at RL of 0.1g/kg Organic Fibres Detected	<0.01
SE228926.011	BH110_0.2-0.4	Soil	132g Clay,Sand,Soil, Rocks	14 Feb 2022	No Asbestos Found at RL of 0.1g/kg Organic Fibres Detected	<0.01

METHOD SUMMARY

METHOD	METHODOLOGY SUMMARY
AN602	Qualitative identification of chrysotile, amosite and crocidolite in bulk samples by polarised light microscopy (PLM) in conjunction with dispersion staining (DS). AS4964 provides the basis for this document. Unequivocal identification of the asbestos minerals present is made by obtaining sufficient diagnostic `clues`, which provide a reasonable degree of certainty, dispersion staining is a mandatory `clue` for positive identification. If sufficient `clues` are absent, then positive identification of asbestos is not possible. This procedure requires removal of suspect fibres/bundles from the sample which cannot be returned.
AN602	Fibres/material that cannot be unequivocably identified as one of the three asbestos forms, will be reported as unknown mineral fibres (umf) The fibres detected may or may not be asbestos fibres.
AN602	AS4964.2004 Method for the Qualitative Identification of Asbestos in Bulk Samples , Section 8.4, Trace Analysis Criteria, Note 4 states:"Depending upon sample condition and fibre type, the detection/reporting limit (RL) of this technique has been found to lie generally in the range of 1 in 1,000 to 1 in 10,000 parts by weight, equivalent to 1 to 0.1 g/kg."
AN602	The sample can be reported “no asbestos found at the reporting limit (RL) of 0.1 g/kg” (<0.01%w/w) where AN602 section 4.5 of this method has been followed, and if- (a) no trace asbestos fibres have been detected (i.e. no ‘respirable ’ fibres): (b) the estimated weight of non-respirable asbestos fibre bundles and/or the estimated weight of asbestos in asbestos-containing materials are found to be less than 0.1g/kg: and (c) these non-respirable asbestos fibre bundles and/or the asbestos containing materials are only visible under stereo-microscope viewing conditions.

FOOTNOTES

Amosite	-	Brown Asbestos	NA	-	Not Analysed
Chrysotile	-	White Asbestos	LNR	-	Listed, Not Required
Crocidolite	-	Blue Asbestos	*	-	NATA accreditation does not cover the performance of this service .
Amphiboles	-	Amosite and/or Crocidolite	**	-	Indicative data, theoretical holding time exceeded.
			***	-	Indicates that both * and ** apply.

(In reference to soil samples only) This report does not comply with the analytical reporting recommendations in the Western Australian Department of Health Guidelines for the Assessment and Remediation and Management of Asbestos Contaminated sites in Western Australia - May 2009.

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.

Where reported: 'Asbestos Detected': Asbestos detected by polarised light microscopy, including dispersion staining.
Where reported: 'No Asbestos Found': No Asbestos Found by polarised light microscopy, including dispersion staining.
Where reported: 'UMF Detected': Mineral fibres of unknown type detected by polarised light microscopy, including dispersion staining. Confirmation by another independent analytical technique may be necessary.

Even after disintegration it can be very difficult, or impossible, to detect the presence of asbestos in some asbestos -containing bulk materials using polarised light microscopy. This is due to the low grade or small length or diameter of asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials.

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au/en-gb/environment-health-and-safety.

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CERTIFICATE OF ANALYSIS 288840

Client Details

Client	EI Australia
Attention	Lab Email
Address	Suite 6.01, 55 Miller Street, Pyrmont, NSW, 2009

Sample Details

Your Reference	**E25541, 16 Macpherson St, Warriewood**
Number of Samples	1 Soil
Date samples received	15/02/2022
Date completed instructions received	15/02/2022

Analysis Details

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

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

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

Report Details

Date results requested by	22/02/2022
Date of Issue	17/02/2022

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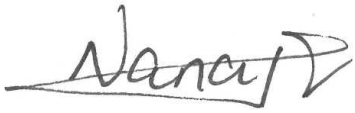
Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

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

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		288840-1
Your Reference	UNITS	BH100-QT1
Date Sampled		14/02/2022
Type of sample		Soil
Date extracted	-	16/02/2022
Date analysed	-	16/02/2022
TRH C_6 - C_9	mg/kg	<25
TRH C_6 - C_{10}	mg/kg	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
Naphthalene	mg/kg	<1
Total +ve Xylenes	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	89

svTRH (C10-C40) in Soil		
Our Reference		288840-1
Your Reference	UNITS	BH100-QT1
Date Sampled		14/02/2022
Type of sample		Soil
Date extracted	-	16/02/2022
Date analysed	-	17/02/2022
TRH C_{10} - C_{14}	mg/kg	<50
TRH C_{15} - C_{28}	mg/kg	<100
TRH C_{29} - C_{36}	mg/kg	<100
Total +ve TRH (C10-C36)	mg/kg	<50
TRH >C_{10} -C_{16}	mg/kg	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50
TRH >C_{16} -C_{34}	mg/kg	<100
TRH >C_{34} -C_{40}	mg/kg	<100
Total +ve TRH (>C10-C40)	mg/kg	<50
Surrogate o-Terphenyl	%	71

Acid Extractable metals in soil		
Our Reference		288840-1
Your Reference	UNITS	BH100-QT1
Date Sampled		14/02/2022
Type of sample		Soil
Date prepared	-	16/02/2022
Date analysed	-	16/02/2022
Arsenic	mg/kg	<4
Cadmium	mg/kg	<0.4
Chromium	mg/kg	9
Copper	mg/kg	9
Lead	mg/kg	26
Mercury	mg/kg	<0.1
Nickel	mg/kg	3
Zinc	mg/kg	40

Moisture		
Our Reference		288840-1
Your Reference	UNITS	BH100-QT1
Date Sampled		14/02/2022
Type of sample		Soil
Date prepared	-	16/02/2022
Date analysed	-	17/02/2022
Moisture	%	13

Method ID	Methodology Summary
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			16/02/2022	[NT]	[NT]	[NT]	[NT]	16/02/2022	[NT]
Date analysed	-			16/02/2022	[NT]	[NT]	[NT]	[NT]	16/02/2022	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	94	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	94	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	[NT]	[NT]	[NT]	[NT]	86	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	[NT]	[NT]	[NT]	[NT]	99	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	90	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	98	[NT]
o-Xylene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Naphthalene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	93	[NT]	[NT]	[NT]	[NT]	101	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			16/02/2022	[NT]	[NT]	[NT]	[NT]	16/02/2022	[NT]
Date analysed	-			17/02/2022	[NT]	[NT]	[NT]	[NT]	17/02/2022	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	76	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	82	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	119	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	76	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	82	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	119	[NT]
Surrogate o-Terphenyl	%		Org-020	97	[NT]	[NT]	[NT]	[NT]	75	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date prepared	-			16/02/2022	[NT]	[NT]	[NT]	[NT]	16/02/2022	[NT]
Date analysed	-			16/02/2022	[NT]	[NT]	[NT]	[NT]	16/02/2022	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	92	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	86	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	87	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	107	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	87	[NT]

Result Definitions

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

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

Appendix I – QA/QC Assessment

I1.1 Quality Assurance / Quality Control Program

Quality assurance comprises an assessment of the reliability of the field procedures and laboratory results against standard industry practices and the SAQP. A summary of the project QA/QC measures incorporated into this ASI is presented in **Table I-1**.

Table I-1 Project QC Measures

Task	Description	Project
Field QA/QC		
General	Work was to be undertaken following standard field procedures which are based on industry accepted standard practice.	Soil samples were collected directly from the augers. Soil samples were placed in 250 gram glass jars, which were filled to minimise headspace, and sealed using Teflon-coated lids.
	All fieldwork was supervised by a suitably qualified and experienced scientist or engineer.	Yes
Soil Screening with PID	The PID was serviced and calibrated as per manufacturer requirements. PID calibrated at the beginning of each day of fieldwork.	Yes See **Appendix F** for calibration documentation.
Equipment Decontamination	Sampling equipment to be decontaminated after the collection of each soil sample by washing with phosphate-free detergent (such as Decon 90 or Alconox) and potable water, followed by a final distilled water rinse. One rinsate blank would be collected and analysed for the primary contaminants. All results should be non-detect.	Yes One rinsate sample was collected on 14 February 2022 (BH100-RS). All results were non-detect.
Transport	Samples were stored in a chilled (with ice) cooler box and transported to the laboratories. To ensure the integrity of the samples from collection to receipt by the analytical laboratory, samples were sent by courier to the laboratories under 'chain of custody' describing sample preservation and transport duration.	Yes
Trip Blanks	Trip Blank (TB) samples were to be prepared and analysed by the primary laboratory for BTEX. Analytical results for this sample were below the laboratory LOR, indicating that ideal sample transport and handling conditions were achieved.	One trip blank sample (BH100-TB) prepared by the primary laboratory, was analysed for BTEX during soil testing. The results were reported below the laboratory LOR, indicating that ideal sample transport and handling conditions were achieved.

Task	Description	Project
Trip Spikes	Trip spike (TS) samples were to be submitted to the primary laboratory for BTEX analysis, the results for which were reported within the RPD acceptance levels for trip spike recovery. It was therefore concluded that satisfactory sample transport and handling conditions were achieved.	One trip spike sample (BH100-TS) was submitted to the primary laboratory for BTEX analysis, the results of which were reported within the RPD acceptance levels for trip spike recovery. It was therefore concluded that satisfactory sample transport and handling conditions were achieved.
Duplicates	Field duplicate samples were analysed as follows: ▪ intra-laboratory duplicate samples at a rate of 1 in 20 primary samples (as per NEPM); and ▪ inter-laboratory duplicate samples at a rate of 1 in 20 primary samples (as per NEPM). Field and laboratory acceptable limits between 30-50% RPD as stated by AS4482.1–2005. RPDs that exceed this range may be considered acceptable where: ▪ Results are less than 10 times the limits of reporting (LOR); ▪ Results are less than 20 times the LOR and the RPD is less than 50%; or ▪ Heterogeneous materials or volatile compounds are encountered. Non-compliance is to be documented in the report and the sample re-analysed or a higher level conservatively adopted.	The required sampling density of 1 per 20 duplicated primary samples was achieved and sufficient for the investigation. All samples complied with RPD calculations. Field QC samples and calculated RPD values are presented in **Table I-5**. Copies of laboratory reports are included in **Appendix H**.
Laboratory QA/QC		
Laboratory Analysis	The laboratories selected are NATA accredited for the analytes selected and perform their own internal QA/QC programs.	Yes SGS - primary laboratory Envirolab - secondary laboratory Laboratory QA/QC analyses are included in **Appendix J.**
	Appropriate detection limits were used for the analyses to be undertaken.	Practical Quantitation Limits for all tested parameters during the ASI are presented in summary tables **Table QC3** in **Appendix J.**
Holding Times	Holding times are the maximum permissible elapsed time in days from the collection of the sample to its extraction and/or analysis. All extraction and analyses should be completed within standard guidelines.	Assessment of holding times has been undertaken by the laboratory.

Task	Description	Project
Method Blanks	The method blank sample is laboratory prepared, containing the reagents used to prepare the sample for final analysis. The purpose of this procedure is to identify contamination in the reagent materials and assess potential bias in the sample analysis due to contaminated reagents. The QC criterion aims to find no detectable contamination in the reagents. Each analysis procedure should be subject to a method blank analysis. The results of each should indicate that contaminants were not detected.	Assessment of method blanks has been undertaken by the laboratory.
Laboratory Duplicates	Laboratory duplicates are field samples that are split in the laboratory and subsequently analysed a number of times in the same batch. These sub-samples are selected by the laboratory to assess the accuracy and precision of the analytical method. The selected laboratories should undertake QA/QC procedures such as calibration standards, laboratory control samples, surrogates, reference materials, sample duplicates and matrix spikes. Intra-laboratory duplicates should be performed at a frequency of 1 per 10 samples.	Assessment of laboratory duplicates has been undertaken by the laboratory.
Laboratory Control Standard	A laboratory control standard is a standard reference material used in preparing primary standards. The concentration should be equivalent to a mid-range standard to confirm the primary calibration. Laboratory control samples should be performed on a frequency of 1 per 20 samples or at least one per analytical run.	Assessment of laboratory control standards has been undertaken by the laboratory.
Matrix Spikes / Matrix Spike Duplicates	Matric spikes are field samples to which a predetermined stock solution of known concentration has been added. The samples are then analysed for recovery of the known addition. Recoveries should be within the stated laboratory control limits of 70 to 130% and duplicates should have RPDs of less than 50%.	Assessment of matrix spikes has been undertaken by the laboratory.

Task	Description	Project
Surrogate Spikes	Surrogate spikes provide a means of checking, for every analysis that no gross errors have occurred at any stage of the procedure leading to significant analyte loss. Recoveries should be within the stated laboratory control limits of 70 to 130%.	Assessment of surrogate spikes has been undertaken by the laboratory.
Conclusion	The QA/QC indicators should either all comply with the required standards or showed no variations that would have no significant effect on the quality of the data.	Assessment of the investigation QA/QC is presented in the following sections.

I1.2 Calculation of Relative Percentage Difference

The RPD values were calculated using the following equation:

$$RPD = \frac{|C_O - C_R|}{[(C_O + C_R)/2]} \times 100$$

Where:

C_O = Concentration obtained for the primary sample; and

C_R = Concentration obtained for the blind replicate or split duplicate sample.

I2.1 Field QA/QC

The field (intra- / inter- laboratory) duplicate samples collected during the works are summarised in **Table I-2**. Inter-lab duplicates were analysed by the secondary laboratory, Envirolab.

Table I-2 Field QC Sampling Program

Matrix	Primary QA Sample	Duplicate (Primary Lab)	Triplicate (Secondary Lab)	Total Duplicates
Soil	BH101_0.2-0.4	QD1	QT1	2

I2.2 Field Data Quality Indicators

A discussion of the field data quality indicators is presented in **Table I-3** below.

Table I-3 Field Data Quality Indicators

DQI	Item	Conformance
Precision Measure of the variability (or reproducibility) of data.	SOPs appropriate and complied with	**Yes**
Accuracy Quantitative measure of the closeness of reported data to the true values.	SOPs appropriate and complied with	**Yes**
	Calibration of instruments against known standards	**Yes**
Representativeness Confidence the data are representative of each media present on the site.	Appropriate media sampled according to SAQP	**Yes**
	Each media identified in SAQP sampled	**Yes**
Completeness Percentage of useable data from sampling episode (set).	Each critical location sampled	**Yes**
	SAQP appropriate and complied with	**Yes**
	Appropriate number of field duplicate samples taken	**Yes**
	Experienced sampler	**Yes**
	Field documentation correct	**Yes**
Comparability Confidence [expressed qualitatively] that data may be considered to be equivalent for each sampling and analytical event.	Same sampling method used on each occasion/location	**Yes**
	Experienced sampler	**Yes**
	Same type of samples collected (filtered, size, fractions)	**Yes**

I2.3 Conclusion for the Field QA/QC

All field work, including equipment decontamination and sample preservation and transport, was conducted in accordance with the SAQP and SOPs, which were devised with reference to industry-approved guidelines. Appropriate QC measures were integrated into each sampling event and the DQI were met, or if not, the variability was suitably justified.

All samples, including field QC samples, were transported to the primary and secondary laboratories under refrigerated conditions, using strict COC procedures. Relevant documents (COC forms) were presented with the samples at the times of delivery. All supporting documents (COCs and SRAs) were completed in full and signed, where appropriate. Copies of these were included in **Appendix G**. EI considered the field QA/QC program carried out during the ASI to be appropriate.

I2.4 Laboratory QA/QC

Primary and intra-laboratory duplicate samples were analysed by SGS (located in Alexandria NSW), with inter-laboratory duplicate samples analysed by Envirolab (located in Chatswood NSW). All laboratories are accredited by NATA for the analyses undertaken. A discussion of the laboratory DQIs is presented below.

Table I-4 Laboratory Data Quality Indicators

DQI	Item	Conformance
Completeness A measure of the amount of useable data (expressed as %) from a data collection activity	All critical samples analysed according to SAQP and proposal	**Yes**
	All analytes analysed according to SAQP in proposal	**Yes**
	Appropriate methods and PQLs	**Yes**
	Sample documentation complete	**Yes**
	Sample holding times complied with	**Yes**
Comparability The confidence (expressed qualitatively) that data may be considered to be equivalent for each sampling and analytical event	Sample analytical methods used (including clean-up)	**Yes**
	Sample PQLs (justify/ quantify if different)	**Yes**
	Same laboratories (justify/ quantify if different)	**Yes**
	Same units (justify/ quantify if different)	**Yes**
Representativeness Confidence that data are representative of each media	All key samples analysed according to SAQP in the proposal	**Yes**
Precision A quantitative measure of the variability (or reproducibility) of data	Analysis of laboratory duplicates	**Yes**
	Analysis of field duplicates	**Yes**
	Analysis of laboratory-prepared volatile trip spikes	**Yes**
Accuracy A quantitative measure of the closeness of reported data to the true value	Analysis of field blanks	**Yes**
	Analysis of rinsate blanks	**Yes**
	Analysis of method blanks	**Yes**
	Analysis of matrix spikes (MS)	**Yes**
	Analysis of matrix spike duplicates (MSD)	**Yes**
	Analysis of surrogate spikes	**Yes**
	Analysis of reference materials	Not applicable
	Analysis of laboratory control samples	**Yes**

I2.5 Conclusions for the Laboratory QA/QC

All contracted laboratories (SGS and Envirolab) were accredited by NATA for the analyses undertaken. All analytical procedures used were industry recognised and endorsed standard methods. Appropriate QC measures were integrated into each testing batch and the DQI were met, or if not, the variability was suitably justified. All final reports were submitted in full and included all requested analyses, as per the signed COC forms. EI considered the laboratory QA/QC programs carried out during the ASI to be appropriate.

I2.6 Summary of Project QA/QC

The project DQOs specified in **Section 6**, **Table 6-1** were considered to have been achieved. The adopted QA/QC program ensured that the data collated during the ASI were accurate, precise and representative of the (final) site conditions. It was therefore considered that the data were sufficiently precise and accurate and that the results could be used for ASI interpretative purposes.

Table I-5 Summary of QA/QC results for Investigation samples

Sample identification	Sampled Date	Description	TRH				BTEX				Heavy Metals							
			F1*	F2**	F3 (>C_{16} - C_{34})	F4 (>C_{34} - C_{40})	Benzene	Toluene	Ethylbenzene	Xylene (total)	Arsenic	Cadmium	Chromium (Total)	Copper	Lead	Mercury	Nickel	Zinc
Soil																		
Intra-laboratory Duplicate																		
BH101_0.2-0.4	14/2/2022	Fill	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	2	<0.3	8.4	7.4	24	0.09	2.5	46
BH100-QD1	14/2/2022	Replicate of BH101_0.2-0.4	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	2	<0.3	9	7.4	22	<0.05	2.5	49
RPD			***0.00***	***0.00***	***0.00***	***0.00***	***0.00***	***0.00***	***0.00***	***0.00***	***0.00***	***0.00***	***6.90***	***0.00***	***8.70***	**69.57**	***0.00***	***6.32***
Inter-laboratory Duplicate																		
BH101_0.2-0.4	14/2/2022	Fill	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	2	<0.3	8.4	7.4	24	0.09	2.5	46
BH100-QT1	14/2/2022	Replicate of BH101_0.2-0.4	<25	<50	<100	<100	<2	<0.5	<1	<3	<4	<0.4	9	9	26	<0.1	3	40
RPD			***0.00***	***NA***	***NA***	***NA***	***NA***	***NA***	***NA***	***NA***	**100.00**	***NA***	***6.90***	***19.51***	***8.00***	***14.29***	***18.18***	***13.95***
BH100-TB	14/02/2022	Trip blank	-	-	-	-	<0.1	<0.1	<0.1	<0.3	-	-	-	-	-	-	-	-
BH100-TS		Trip spike	-	-	-	-	[93%]	[97%]	[99%]	-	-	-	-	-	-	-	-	-
BH100-RS		Rinsate	<50	<60	<500	<500	<0.5	<0.5	<0.5	<1.5	<1	<0.1	<1	1	<1	<0.1	<1	<5

52.17	Indicates values where a single result is found to be less than detection, with the duplicate sample found to be over the detection limit.
82.35	RPD exceeds 30-50% range referenced from AS4482.1 (2005)

NOTE:

All soil results are reported in mg/kg . All water results are reported in µg/L.

* - to obtain F1 subtract the sum of BTEX concentrations from the C_6-C_{10} fraction

** - to obtain F2 subtract naphthalene from the > C_{10}-C_{16} fraction

Appendix J – Laboratory QA/QC and DQOs

STATEMENT OF QA/QC PERFORMANCE

SE228926 R0

CLIENT DETAILS

Contact	Emmanuel Woelders
Client	EI AUSTRALIA
Address	SUITE 6.01 55 MILLER STREET PYRMONT NSW 2009
Telephone	61 2 95160722
Facsimile	(Not specified)
Email	emmanuel.woelders@eiaustralia.com.au
Project	**E25541 16 Macpherson St. Warriewood**
Order Number	**E25541**
Samples	15

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE228926 R0**
Date Received	14 Feb 2022
Date Reported	22 Feb 2022

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS' stated Data Quality Objectives (DQO). Comments arising from the comparison were made and are reported below.

The data relating to sampling was taken from the Chain of Custody document.
This QA/QC Statement must be read in conjunction with the referenced Analytical Report.
The Statement and the Analytical Report must not be reproduced except in full.

All Data Quality Objectives were met with the exception of the following:

Duplicate	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	4 items
	VOCs in Water	1 item
	Volatile Petroleum Hydrocarbons in Water	1 item
Matrix Spike	Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES	3 items
	VOC's in Soil	1 item

SAMPLE SUMMARY

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	14 Soil, 1 Water
Date documentation received	14/2/2022@3:20pm	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	8.0°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

HOLDING TIME SUMMARY

SE228926 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the

Fibre Identification in soil

Method: ME-(AU)-[ENV]AN602

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101_0.2-0.4	SE228926.001	LB242925	14 Feb 2022	14 Feb 2022	14 Feb 2023	18 Feb 2022	14 Feb 2023	21 Feb 2022
BH102_0.3-0.4	SE228926.002	LB242925	14 Feb 2022	14 Feb 2022	14 Feb 2023	18 Feb 2022	14 Feb 2023	21 Feb 2022
BH102_0.9-1.1	SE228926.003	LB242925	14 Feb 2022	14 Feb 2022	14 Feb 2023	18 Feb 2022	14 Feb 2023	21 Feb 2022
BH103_0.1-0.3	SE228926.004	LB242925	14 Feb 2022	14 Feb 2022	14 Feb 2023	18 Feb 2022	14 Feb 2023	21 Feb 2022
BH104_0.1-0.3	SE228926.005	LB242925	14 Feb 2022	14 Feb 2022	14 Feb 2023	18 Feb 2022	14 Feb 2023	21 Feb 2022
BH105_0.3-0.5	SE228926.006	LB242925	14 Feb 2022	14 Feb 2022	14 Feb 2023	18 Feb 2022	14 Feb 2023	21 Feb 2022
BH106_0.3-0.5	SE228926.007	LB242925	14 Feb 2022	14 Feb 2022	14 Feb 2023	18 Feb 2022	14 Feb 2023	21 Feb 2022
BH107_0.3-0.5	SE228926.008	LB242925	14 Feb 2022	14 Feb 2022	14 Feb 2023	18 Feb 2022	14 Feb 2023	21 Feb 2022
BH108_0.1-0.2	SE228926.009	LB242925	14 Feb 2022	14 Feb 2022	14 Feb 2023	18 Feb 2022	14 Feb 2023	21 Feb 2022
BH109_0.2-0.4	SE228926.010	LB242925	14 Feb 2022	14 Feb 2022	14 Feb 2023	18 Feb 2022	14 Feb 2023	21 Feb 2022
BH110_0.2-0.4	SE228926.011	LB242925	14 Feb 2022	14 Feb 2022	14 Feb 2023	18 Feb 2022	14 Feb 2023	21 Feb 2022

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH100_RS	SE228926.015	LB242678	14 Feb 2022	14 Feb 2022	14 Mar 2022	17 Feb 2022	14 Mar 2022	17 Feb 2022

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101_0.2-0.4	SE228926.001	LB242969	14 Feb 2022	14 Feb 2022	14 Mar 2022	18 Feb 2022	14 Mar 2022	21 Feb 2022
BH102_0.3-0.4	SE228926.002	LB242969	14 Feb 2022	14 Feb 2022	14 Mar 2022	18 Feb 2022	14 Mar 2022	21 Feb 2022
BH102_0.9-1.1	SE228926.003	LB242969	14 Feb 2022	14 Feb 2022	14 Mar 2022	18 Feb 2022	14 Mar 2022	21 Feb 2022
BH103_0.1-0.3	SE228926.004	LB242969	14 Feb 2022	14 Feb 2022	14 Mar 2022	18 Feb 2022	14 Mar 2022	21 Feb 2022
BH104_0.1-0.3	SE228926.005	LB242969	14 Feb 2022	14 Feb 2022	14 Mar 2022	18 Feb 2022	14 Mar 2022	21 Feb 2022
BH105_0.3-0.5	SE228926.006	LB242969	14 Feb 2022	14 Feb 2022	14 Mar 2022	18 Feb 2022	14 Mar 2022	21 Feb 2022
BH106_0.3-0.5	SE228926.007	LB242969	14 Feb 2022	14 Feb 2022	14 Mar 2022	18 Feb 2022	14 Mar 2022	21 Feb 2022
BH107_0.3-0.5	SE228926.008	LB242969	14 Feb 2022	14 Feb 2022	14 Mar 2022	18 Feb 2022	14 Mar 2022	21 Feb 2022
BH108_0.1-0.2	SE228926.009	LB242969	14 Feb 2022	14 Feb 2022	14 Mar 2022	18 Feb 2022	14 Mar 2022	21 Feb 2022
BH109_0.2-0.4	SE228926.010	LB242969	14 Feb 2022	14 Feb 2022	14 Mar 2022	18 Feb 2022	14 Mar 2022	21 Feb 2022
BH110_0.2-0.4	SE228926.011	LB242969	14 Feb 2022	14 Feb 2022	14 Mar 2022	18 Feb 2022	14 Mar 2022	21 Feb 2022
BH100_QD1	SE228926.012	LB242969	14 Feb 2022	14 Feb 2022	14 Mar 2022	18 Feb 2022	14 Mar 2022	21 Feb 2022

Moisture Content

Method: ME-(AU)-[ENV]AN002

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101_0.2-0.4	SE228926.001	LB242855	14 Feb 2022	14 Feb 2022	28 Feb 2022	17 Feb 2022	22 Feb 2022	21 Feb 2022
BH102_0.3-0.4	SE228926.002	LB242855	14 Feb 2022	14 Feb 2022	28 Feb 2022	17 Feb 2022	22 Feb 2022	21 Feb 2022
BH102_0.9-1.1	SE228926.003	LB242855	14 Feb 2022	14 Feb 2022	28 Feb 2022	17 Feb 2022	22 Feb 2022	21 Feb 2022
BH103_0.1-0.3	SE228926.004	LB242855	14 Feb 2022	14 Feb 2022	28 Feb 2022	17 Feb 2022	22 Feb 2022	21 Feb 2022
BH104_0.1-0.3	SE228926.005	LB242855	14 Feb 2022	14 Feb 2022	28 Feb 2022	17 Feb 2022	22 Feb 2022	21 Feb 2022
BH105_0.3-0.5	SE228926.006	LB242855	14 Feb 2022	14 Feb 2022	28 Feb 2022	17 Feb 2022	22 Feb 2022	21 Feb 2022
BH106_0.3-0.5	SE228926.007	LB242855	14 Feb 2022	14 Feb 2022	28 Feb 2022	17 Feb 2022	22 Feb 2022	21 Feb 2022
BH107_0.3-0.5	SE228926.008	LB242855	14 Feb 2022	14 Feb 2022	28 Feb 2022	17 Feb 2022	22 Feb 2022	21 Feb 2022
BH108_0.1-0.2	SE228926.009	LB242855	14 Feb 2022	14 Feb 2022	28 Feb 2022	17 Feb 2022	22 Feb 2022	21 Feb 2022
BH109_0.2-0.4	SE228926.010	LB242855	14 Feb 2022	14 Feb 2022	28 Feb 2022	17 Feb 2022	22 Feb 2022	21 Feb 2022
BH110_0.2-0.4	SE228926.011	LB242855	14 Feb 2022	14 Feb 2022	28 Feb 2022	17 Feb 2022	22 Feb 2022	21 Feb 2022
BH100_QD1	SE228926.012	LB242855	14 Feb 2022	14 Feb 2022	28 Feb 2022	17 Feb 2022	22 Feb 2022	21 Feb 2022
BH100_TB	SE228926.013	LB242855	14 Feb 2022	14 Feb 2022	28 Feb 2022	17 Feb 2022	22 Feb 2022	21 Feb 2022

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101_0.2-0.4	SE228926.001	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH102_0.3-0.4	SE228926.002	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH102_0.9-1.1	SE228926.003	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH103_0.1-0.3	SE228926.004	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH104_0.1-0.3	SE228926.005	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH105_0.3-0.5	SE228926.006	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH106_0.3-0.5	SE228926.007	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH107_0.3-0.5	SE228926.008	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH108_0.1-0.2	SE228926.009	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH109_0.2-0.4	SE228926.010	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH110_0.2-0.4	SE228926.011	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH100_QD1	SE228926.012	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022

HOLDING TIME SUMMARY

SE228926 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101_0.2-0.4	SE228926.001	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH102_0.3-0.4	SE228926.002	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH102_0.9-1.1	SE228926.003	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH103_0.1-0.3	SE228926.004	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH104_0.1-0.3	SE228926.005	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH105_0.3-0.5	SE228926.006	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH106_0.3-0.5	SE228926.007	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH107_0.3-0.5	SE228926.008	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH108_0.1-0.2	SE228926.009	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH109_0.2-0.4	SE228926.010	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH110_0.2-0.4	SE228926.011	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH100_QD1	SE228926.012	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101_0.2-0.4	SE228926.001	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH102_0.3-0.4	SE228926.002	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH102_0.9-1.1	SE228926.003	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH103_0.1-0.3	SE228926.004	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH104_0.1-0.3	SE228926.005	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH105_0.3-0.5	SE228926.006	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH106_0.3-0.5	SE228926.007	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH107_0.3-0.5	SE228926.008	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH108_0.1-0.2	SE228926.009	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH109_0.2-0.4	SE228926.010	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH110_0.2-0.4	SE228926.011	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH100_QD1	SE228926.012	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101_0.2-0.4	SE228926.001	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH102_0.3-0.4	SE228926.002	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH102_0.9-1.1	SE228926.003	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH103_0.1-0.3	SE228926.004	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH104_0.1-0.3	SE228926.005	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH105_0.3-0.5	SE228926.006	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH106_0.3-0.5	SE228926.007	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH107_0.3-0.5	SE228926.008	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH108_0.1-0.2	SE228926.009	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH109_0.2-0.4	SE228926.010	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH110_0.2-0.4	SE228926.011	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022
BH100_QD1	SE228926.012	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	21 Feb 2022

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101_0.2-0.4	SE228926.001	LB242964	14 Feb 2022	14 Feb 2022	13 Aug 2022	18 Feb 2022	13 Aug 2022	21 Feb 2022
BH102_0.3-0.4	SE228926.002	LB242964	14 Feb 2022	14 Feb 2022	13 Aug 2022	18 Feb 2022	13 Aug 2022	21 Feb 2022
BH102_0.9-1.1	SE228926.003	LB242964	14 Feb 2022	14 Feb 2022	13 Aug 2022	18 Feb 2022	13 Aug 2022	21 Feb 2022
BH103_0.1-0.3	SE228926.004	LB242964	14 Feb 2022	14 Feb 2022	13 Aug 2022	18 Feb 2022	13 Aug 2022	21 Feb 2022
BH104_0.1-0.3	SE228926.005	LB242964	14 Feb 2022	14 Feb 2022	13 Aug 2022	18 Feb 2022	13 Aug 2022	21 Feb 2022
BH105_0.3-0.5	SE228926.006	LB242964	14 Feb 2022	14 Feb 2022	13 Aug 2022	18 Feb 2022	13 Aug 2022	21 Feb 2022
BH106_0.3-0.5	SE228926.007	LB242964	14 Feb 2022	14 Feb 2022	13 Aug 2022	18 Feb 2022	13 Aug 2022	21 Feb 2022
BH107_0.3-0.5	SE228926.008	LB242964	14 Feb 2022	14 Feb 2022	13 Aug 2022	18 Feb 2022	13 Aug 2022	21 Feb 2022
BH108_0.1-0.2	SE228926.009	LB242964	14 Feb 2022	14 Feb 2022	13 Aug 2022	18 Feb 2022	13 Aug 2022	21 Feb 2022
BH109_0.2-0.4	SE228926.010	LB242964	14 Feb 2022	14 Feb 2022	13 Aug 2022	18 Feb 2022	13 Aug 2022	21 Feb 2022
BH110_0.2-0.4	SE228926.011	LB242964	14 Feb 2022	14 Feb 2022	13 Aug 2022	18 Feb 2022	13 Aug 2022	21 Feb 2022
BH100_QD1	SE228926.012	LB242964	14 Feb 2022	14 Feb 2022	13 Aug 2022	18 Feb 2022	13 Aug 2022	21 Feb 2022

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH100_RS	SE228926.015	LB242685	14 Feb 2022	14 Feb 2022	13 Aug 2022	16 Feb 2022	13 Aug 2022	17 Feb 2022

HOLDING TIME SUMMARY

SE228926 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101_0.2-0.4	SE228926.001	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	22 Feb 2022
BH102_0.3-0.4	SE228926.002	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	22 Feb 2022
BH102_0.9-1.1	SE228926.003	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	22 Feb 2022
BH103_0.1-0.3	SE228926.004	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	22 Feb 2022
BH104_0.1-0.3	SE228926.005	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	22 Feb 2022
BH105_0.3-0.5	SE228926.006	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	22 Feb 2022
BH106_0.3-0.5	SE228926.007	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	22 Feb 2022
BH107_0.3-0.5	SE228926.008	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	22 Feb 2022
BH108_0.1-0.2	SE228926.009	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	22 Feb 2022
BH109_0.2-0.4	SE228926.010	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	22 Feb 2022
BH110_0.2-0.4	SE228926.011	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	22 Feb 2022
BH100_QD1	SE228926.012	LB242757	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Mar 2022	22 Feb 2022

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH100_RS	SE228926.015	LB242770	14 Feb 2022	14 Feb 2022	21 Feb 2022	17 Feb 2022	29 Mar 2022	21 Feb 2022

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101_0.2-0.4	SE228926.001	LB242763	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Feb 2022	21 Feb 2022
BH102_0.3-0.4	SE228926.002	LB242763	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Feb 2022	21 Feb 2022
BH102_0.9-1.1	SE228926.003	LB242763	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Feb 2022	21 Feb 2022
BH103_0.1-0.3	SE228926.004	LB242763	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Feb 2022	21 Feb 2022
BH104_0.1-0.3	SE228926.005	LB242763	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Feb 2022	21 Feb 2022
BH105_0.3-0.5	SE228926.006	LB242763	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Feb 2022	21 Feb 2022
BH106_0.3-0.5	SE228926.007	LB242763	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Feb 2022	21 Feb 2022
BH107_0.3-0.5	SE228926.008	LB242763	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Feb 2022	21 Feb 2022
BH108_0.1-0.2	SE228926.009	LB242763	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Feb 2022	21 Feb 2022
BH109_0.2-0.4	SE228926.010	LB242763	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Feb 2022	21 Feb 2022
BH110_0.2-0.4	SE228926.011	LB242763	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Feb 2022	21 Feb 2022
BH100_QD1	SE228926.012	LB242763	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Feb 2022	21 Feb 2022
BH100_TB	SE228926.013	LB242763	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Feb 2022	21 Feb 2022
BH100_TS	SE228926.014	LB242763	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Feb 2022	21 Feb 2022

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH100_RS	SE228926.015	LB242783	14 Feb 2022	14 Feb 2022	28 Feb 2022	17 Feb 2022	28 Feb 2022	18 Feb 2022

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101_0.2-0.4	SE228926.001	LB242763	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Feb 2022	21 Feb 2022
BH102_0.3-0.4	SE228926.002	LB242763	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Feb 2022	21 Feb 2022
BH102_0.9-1.1	SE228926.003	LB242763	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Feb 2022	21 Feb 2022
BH103_0.1-0.3	SE228926.004	LB242763	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Feb 2022	21 Feb 2022
BH104_0.1-0.3	SE228926.005	LB242763	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Feb 2022	21 Feb 2022
BH105_0.3-0.5	SE228926.006	LB242763	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Feb 2022	21 Feb 2022
BH106_0.3-0.5	SE228926.007	LB242763	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Feb 2022	21 Feb 2022
BH107_0.3-0.5	SE228926.008	LB242763	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Feb 2022	21 Feb 2022
BH108_0.1-0.2	SE228926.009	LB242763	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Feb 2022	21 Feb 2022
BH109_0.2-0.4	SE228926.010	LB242763	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Feb 2022	21 Feb 2022
BH110_0.2-0.4	SE228926.011	LB242763	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Feb 2022	21 Feb 2022
BH100_QD1	SE228926.012	LB242763	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Feb 2022	21 Feb 2022
BH100_TB	SE228926.013	LB242763	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Feb 2022	21 Feb 2022
BH100_TS	SE228926.014	LB242763	14 Feb 2022	14 Feb 2022	28 Feb 2022	16 Feb 2022	28 Feb 2022	21 Feb 2022

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH100_RS	SE228926.015	LB242783	14 Feb 2022	14 Feb 2022	28 Feb 2022	17 Feb 2022	28 Feb 2022	18 Feb 2022

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	BH101_0.2-0.4	SE228926.001	%	60 - 130%	99
	BH102_0.3-0.4	SE228926.002	%	60 - 130%	106
	BH102_0.9-1.1	SE228926.003	%	60 - 130%	103
	BH103_0.1-0.3	SE228926.004	%	60 - 130%	108
	BH104_0.1-0.3	SE228926.005	%	60 - 130%	104
	BH105_0.3-0.5	SE228926.006	%	60 - 130%	103
	BH106_0.3-0.5	SE228926.007	%	60 - 130%	106
	BH107_0.3-0.5	SE228926.008	%	60 - 130%	104
	BH108_0.1-0.2	SE228926.009	%	60 - 130%	109
	BH109_0.2-0.4	SE228926.010	%	60 - 130%	111
	BH110_0.2-0.4	SE228926.011	%	60 - 130%	107

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	BH101_0.2-0.4	SE228926.001	%	60 - 130%	94
	BH102_0.3-0.4	SE228926.002	%	60 - 130%	96
	BH102_0.9-1.1	SE228926.003	%	60 - 130%	95
	BH103_0.1-0.3	SE228926.004	%	60 - 130%	92
	BH104_0.1-0.3	SE228926.005	%	60 - 130%	93
	BH105_0.3-0.5	SE228926.006	%	60 - 130%	95
	BH106_0.3-0.5	SE228926.007	%	60 - 130%	94
	BH107_0.3-0.5	SE228926.008	%	60 - 130%	93
	BH108_0.1-0.2	SE228926.009	%	60 - 130%	94
	BH109_0.2-0.4	SE228926.010	%	60 - 130%	91
	BH110_0.2-0.4	SE228926.011	%	60 - 130%	91
d14-p-terphenyl (Surrogate)	BH101_0.2-0.4	SE228926.001	%	60 - 130%	97
	BH102_0.3-0.4	SE228926.002	%	60 - 130%	98
	BH102_0.9-1.1	SE228926.003	%	60 - 130%	96
	BH103_0.1-0.3	SE228926.004	%	60 - 130%	94
	BH104_0.1-0.3	SE228926.005	%	60 - 130%	96
	BH105_0.3-0.5	SE228926.006	%	60 - 130%	95
	BH106_0.3-0.5	SE228926.007	%	60 - 130%	94
	BH107_0.3-0.5	SE228926.008	%	60 - 130%	95
	BH108_0.1-0.2	SE228926.009	%	60 - 130%	96
	BH109_0.2-0.4	SE228926.010	%	60 - 130%	94
	BH110_0.2-0.4	SE228926.011	%	60 - 130%	93

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	BH101_0.2-0.4	SE228926.001	%	70 - 130%	94
	BH102_0.3-0.4	SE228926.002	%	70 - 130%	96
	BH102_0.9-1.1	SE228926.003	%	70 - 130%	95
	BH103_0.1-0.3	SE228926.004	%	70 - 130%	92
	BH104_0.1-0.3	SE228926.005	%	70 - 130%	93
	BH105_0.3-0.5	SE228926.006	%	70 - 130%	95
	BH106_0.3-0.5	SE228926.007	%	70 - 130%	94
	BH107_0.3-0.5	SE228926.008	%	70 - 130%	93
	BH108_0.1-0.2	SE228926.009	%	70 - 130%	94
	BH109_0.2-0.4	SE228926.010	%	70 - 130%	91
	BH110_0.2-0.4	SE228926.011	%	70 - 130%	91
d14-p-terphenyl (Surrogate)	BH101_0.2-0.4	SE228926.001	%	70 - 130%	97
	BH102_0.3-0.4	SE228926.002	%	70 - 130%	98
	BH102_0.9-1.1	SE228926.003	%	70 - 130%	96
	BH103_0.1-0.3	SE228926.004	%	70 - 130%	94
	BH104_0.1-0.3	SE228926.005	%	70 - 130%	96
	BH105_0.3-0.5	SE228926.006	%	70 - 130%	95
	BH106_0.3-0.5	SE228926.007	%	70 - 130%	94
	BH107_0.3-0.5	SE228926.008	%	70 - 130%	95
	BH108_0.1-0.2	SE228926.009	%	70 - 130%	96
	BH109_0.2-0.4	SE228926.010	%	70 - 130%	94
	BH110_0.2-0.4	SE228926.011	%	70 - 130%	93
d5-nitrobenzene (Surrogate)	BH101_0.2-0.4	SE228926.001	%	70 - 130%	96

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
d5-nitrobenzene (Surrogate)	BH102_0.3-0.4	SE228926.002	%	70 - 130%	100
	BH102_0.9-1.1	SE228926.003	%	70 - 130%	97
	BH103_0.1-0.3	SE228926.004	%	70 - 130%	95
	BH104_0.1-0.3	SE228926.005	%	70 - 130%	97
	BH105_0.3-0.5	SE228926.006	%	70 - 130%	96
	BH106_0.3-0.5	SE228926.007	%	70 - 130%	95
	BH107_0.3-0.5	SE228926.008	%	70 - 130%	95
	BH108_0.1-0.2	SE228926.009	%	70 - 130%	97
	BH109_0.2-0.4	SE228926.010	%	70 - 130%	97
	BH110_0.2-0.4	SE228926.011	%	70 - 130%	97

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	BH101_0.2-0.4	SE228926.001	%	60 - 130%	99
	BH102_0.3-0.4	SE228926.002	%	60 - 130%	106
	BH102_0.9-1.1	SE228926.003	%	60 - 130%	103
	BH103_0.1-0.3	SE228926.004	%	60 - 130%	108
	BH104_0.1-0.3	SE228926.005	%	60 - 130%	104
	BH105_0.3-0.5	SE228926.006	%	60 - 130%	103
	BH106_0.3-0.5	SE228926.007	%	60 - 130%	106
	BH107_0.3-0.5	SE228926.008	%	60 - 130%	104
	BH108_0.1-0.2	SE228926.009	%	60 - 130%	109
	BH109_0.2-0.4	SE228926.010	%	60 - 130%	111
	BH110_0.2-0.4	SE228926.011	%	60 - 130%	107

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH101_0.2-0.4	SE228926.001	%	60 - 130%	66
	BH102_0.3-0.4	SE228926.002	%	60 - 130%	68
	BH102_0.9-1.1	SE228926.003	%	60 - 130%	68
	BH103_0.1-0.3	SE228926.004	%	60 - 130%	72
	BH104_0.1-0.3	SE228926.005	%	60 - 130%	73
	BH105_0.3-0.5	SE228926.006	%	60 - 130%	69
	BH106_0.3-0.5	SE228926.007	%	60 - 130%	72
	BH107_0.3-0.5	SE228926.008	%	60 - 130%	71
	BH108_0.1-0.2	SE228926.009	%	60 - 130%	71
	BH109_0.2-0.4	SE228926.010	%	60 - 130%	70
	BH110_0.2-0.4	SE228926.011	%	60 - 130%	63
	BH100_QD1	SE228926.012	%	60 - 130%	69
	BH100_TB	SE228926.013	%	60 - 130%	78
	BH100_TS	SE228926.014	%	60 - 130%	95
d4-1,2-dichloroethane (Surrogate)	BH101_0.2-0.4	SE228926.001	%	60 - 130%	77
	BH102_0.3-0.4	SE228926.002	%	60 - 130%	79
	BH102_0.9-1.1	SE228926.003	%	60 - 130%	78
	BH103_0.1-0.3	SE228926.004	%	60 - 130%	84
	BH104_0.1-0.3	SE228926.005	%	60 - 130%	85
	BH105_0.3-0.5	SE228926.006	%	60 - 130%	81
	BH106_0.3-0.5	SE228926.007	%	60 - 130%	84
	BH107_0.3-0.5	SE228926.008	%	60 - 130%	84
	BH108_0.1-0.2	SE228926.009	%	60 - 130%	84
	BH109_0.2-0.4	SE228926.010	%	60 - 130%	83
	BH110_0.2-0.4	SE228926.011	%	60 - 130%	77
	BH100_QD1	SE228926.012	%	60 - 130%	81
	BH100_TB	SE228926.013	%	60 - 130%	87
	BH100_TS	SE228926.014	%	60 - 130%	108
d8-toluene (Surrogate)	BH101_0.2-0.4	SE228926.001	%	60 - 130%	74
	BH102_0.3-0.4	SE228926.002	%	60 - 130%	79
	BH102_0.9-1.1	SE228926.003	%	60 - 130%	76
	BH103_0.1-0.3	SE228926.004	%	60 - 130%	83
	BH104_0.1-0.3	SE228926.005	%	60 - 130%	83
	BH105_0.3-0.5	SE228926.006	%	60 - 130%	78
	BH106_0.3-0.5	SE228926.007	%	60 - 130%	83

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

VOC's in Soil (continued)

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
d8-toluene (Surrogate)	BH107_0.3-0.5	SE228926.008	%	60 - 130%	82
	BH108_0.1-0.2	SE228926.009	%	60 - 130%	83
	BH109_0.2-0.4	SE228926.010	%	60 - 130%	79
	BH110_0.2-0.4	SE228926.011	%	60 - 130%	75
	BH100_QD1	SE228926.012	%	60 - 130%	80
	BH100_TB	SE228926.013	%	60 - 130%	87
	BH100_TS	SE228926.014	%	60 - 130%	97

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH100_RS	SE228926.015	%	40 - 130%	101
d4-1,2-dichloroethane (Surrogate)	BH100_RS	SE228926.015	%	40 - 130%	111
d8-toluene (Surrogate)	BH100_RS	SE228926.015	%	40 - 130%	103

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH101_0.2-0.4	SE228926.001	%	60 - 130%	66
	BH102_0.3-0.4	SE228926.002	%	60 - 130%	68
	BH102_0.9-1.1	SE228926.003	%	60 - 130%	68
	BH103_0.1-0.3	SE228926.004	%	60 - 130%	72
	BH104_0.1-0.3	SE228926.005	%	60 - 130%	73
	BH105_0.3-0.5	SE228926.006	%	60 - 130%	69
	BH106_0.3-0.5	SE228926.007	%	60 - 130%	72
	BH107_0.3-0.5	SE228926.008	%	60 - 130%	71
	BH108_0.1-0.2	SE228926.009	%	60 - 130%	71
	BH109_0.2-0.4	SE228926.010	%	60 - 130%	70
	BH110_0.2-0.4	SE228926.011	%	60 - 130%	63
	BH100_QD1	SE228926.012	%	60 - 130%	69
d4-1,2-dichloroethane (Surrogate)	BH101_0.2-0.4	SE228926.001	%	60 - 130%	77
	BH102_0.3-0.4	SE228926.002	%	60 - 130%	79
	BH102_0.9-1.1	SE228926.003	%	60 - 130%	78
	BH103_0.1-0.3	SE228926.004	%	60 - 130%	84
	BH104_0.1-0.3	SE228926.005	%	60 - 130%	85
	BH105_0.3-0.5	SE228926.006	%	60 - 130%	81
	BH106_0.3-0.5	SE228926.007	%	60 - 130%	84
	BH107_0.3-0.5	SE228926.008	%	60 - 130%	84
	BH108_0.1-0.2	SE228926.009	%	60 - 130%	84
	BH109_0.2-0.4	SE228926.010	%	60 - 130%	83
	BH110_0.2-0.4	SE228926.011	%	60 - 130%	77
	BH100_QD1	SE228926.012	%	60 - 130%	81
d8-toluene (Surrogate)	BH101_0.2-0.4	SE228926.001	%	60 - 130%	74
	BH102_0.3-0.4	SE228926.002	%	60 - 130%	79
	BH102_0.9-1.1	SE228926.003	%	60 - 130%	76
	BH103_0.1-0.3	SE228926.004	%	60 - 130%	83
	BH104_0.1-0.3	SE228926.005	%	60 - 130%	83
	BH105_0.3-0.5	SE228926.006	%	60 - 130%	78
	BH106_0.3-0.5	SE228926.007	%	60 - 130%	83
	BH107_0.3-0.5	SE228926.008	%	60 - 130%	82
	BH108_0.1-0.2	SE228926.009	%	60 - 130%	83
	BH109_0.2-0.4	SE228926.010	%	60 - 130%	79
	BH110_0.2-0.4	SE228926.011	%	60 - 130%	75
	BH100_QD1	SE228926.012	%	60 - 130%	80

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH100_RS	SE228926.015	%	40 - 130%	101
d4-1,2-dichloroethane (Surrogate)	BH100_RS	SE228926.015	%	60 - 130%	111
d8-toluene (Surrogate)	BH100_RS	SE228926.015	%	40 - 130%	103

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Sample Number	Parameter	Units	LOR	Result
LB242678.001	Mercury	mg/L	0.0001	<0.0001

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Number	Parameter	Units	LOR	Result
LB242969.001	Mercury	mg/kg	0.05	<0.05

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB242757.001		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1
		Alpha BHC	mg/kg	0.1	<0.1
		Lindane	mg/kg	0.1	<0.1
		Heptachlor	mg/kg	0.1	<0.1
		Aldrin	mg/kg	0.1	<0.1
		Beta BHC	mg/kg	0.1	<0.1
		Delta BHC	mg/kg	0.1	<0.1
		Heptachlor epoxide	mg/kg	0.1	<0.1
		Alpha Endosulfan	mg/kg	0.2	<0.2
		Gamma Chlordane	mg/kg	0.1	<0.1
		Alpha Chlordane	mg/kg	0.1	<0.1
		p,p'-DDE	mg/kg	0.1	<0.1
		Dieldrin	mg/kg	0.2	<0.2
		Endrin	mg/kg	0.2	<0.2
		Beta Endosulfan	mg/kg	0.2	<0.2
		p,p'-DDD	mg/kg	0.1	<0.1
		p,p'-DDT	mg/kg	0.1	<0.1
		Endosulfan sulphate	mg/kg	0.1	<0.1
		Endrin Aldehyde	mg/kg	0.1	<0.1
		Methoxychlor	mg/kg	0.1	<0.1
		Endrin Ketone	mg/kg	0.1	<0.1
		Isodrin	mg/kg	0.1	<0.1
		Mirex	mg/kg	0.1	<0.1
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	103

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB242757.001		Dichlorvos	mg/kg	0.5	<0.5
		Dimethoate	mg/kg	0.5	<0.5
		Diazinon (Dimpylate)	mg/kg	0.5	<0.5
		Fenitrothion	mg/kg	0.2	<0.2
		Malathion	mg/kg	0.2	<0.2
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2
		Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2
		Bromophos Ethyl	mg/kg	0.2	<0.2
		Methidathion	mg/kg	0.5	<0.5
		Ethion	mg/kg	0.2	<0.2
		Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2
	Surrogates	2-fluorobiphenyl (Surrogate)	%	-	96
		d14-p-terphenyl (Surrogate)	%	-	102

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result
LB242757.001	Naphthalene	mg/kg	0.1	<0.1
	2-methylnaphthalene	mg/kg	0.1	<0.1
	1-methylnaphthalene	mg/kg	0.1	<0.1
	Acenaphthylene	mg/kg	0.1	<0.1
	Acenaphthene	mg/kg	0.1	<0.1
	Fluorene	mg/kg	0.1	<0.1
	Phenanthrene	mg/kg	0.1	<0.1
	Anthracene	mg/kg	0.1	<0.1

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB242757.001		Fluoranthene	mg/kg	0.1	<0.1
		Pyrene	mg/kg	0.1	<0.1
		Benzo(a)anthracene	mg/kg	0.1	<0.1
		Chrysene	mg/kg	0.1	<0.1
		Benzo(a)pyrene	mg/kg	0.1	<0.1
		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
		Dibenzo(ah)anthracene	mg/kg	0.1	<0.1
		Benzo(ghi)perylene	mg/kg	0.1	<0.1
		Total PAH (18)	mg/kg	0.8	<0.8
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	104
		2-fluorobiphenyl (Surrogate)	%	-	96
		d14-p-terphenyl (Surrogate)	%	-	102

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB242757.001		Arochlor 1016	mg/kg	0.2	<0.2
		Arochlor 1221	mg/kg	0.2	<0.2
		Arochlor 1232	mg/kg	0.2	<0.2
		Arochlor 1242	mg/kg	0.2	<0.2
		Arochlor 1248	mg/kg	0.2	<0.2
		Arochlor 1254	mg/kg	0.2	<0.2
		Arochlor 1260	mg/kg	0.2	<0.2
		Arochlor 1262	mg/kg	0.2	<0.2
		Arochlor 1268	mg/kg	0.2	<0.2
		Total PCBs (Arochlors)	mg/kg	1	<1
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	103

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number	Parameter	Units	LOR	Result
LB242964.001	Arsenic, As	mg/kg	1	<1
	Cadmium, Cd	mg/kg	0.3	<0.3
	Chromium, Cr	mg/kg	0.5	<0.5
	Copper, Cu	mg/kg	0.5	<0.5
	Nickel, Ni	mg/kg	0.5	<0.5
	Lead, Pb	mg/kg	1	<1
	Zinc, Zn	mg/kg	2	<2.0

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR	Result
LB242685.001	Arsenic, As	µg/L	1	<1
	Cadmium, Cd	µg/L	0.1	<0.1
	Chromium, Cr	µg/L	1	<1
	Copper, Cu	µg/L	1	<1
	Lead, Pb	µg/L	1	<1
	Nickel, Ni	µg/L	1	<1
	Zinc, Zn	µg/L	5	<5

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR	Result
LB242757.001	TRH C10-C14	mg/kg	20	<20
	TRH C15-C28	mg/kg	45	<45
	TRH C29-C36	mg/kg	45	<45
	TRH C37-C40	mg/kg	100	<100
	TRH C10-C36 Total	mg/kg	110	<110

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR	Result
LB242770.001	TRH C10-C14	µg/L	50	<50
	TRH C15-C28	µg/L	200	<200
	TRH C29-C36	µg/L	200	<200
	TRH C37-C40	µg/L	200	<200

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number	Parameter	Units	LOR

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

VOC's in Soil (continued)

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB242763.001	Monocyclic Aromatic Hydrocarbons	Benzene	mg/kg	0.1	<0.1
		Toluene	mg/kg	0.1	<0.1
		Ethylbenzene	mg/kg	0.1	<0.1
		m/p-xylene	mg/kg	0.2	<0.2
		o-xylene	mg/kg	0.1	<0.1
	Polycyclic VOCs	Naphthalene (VOC)	mg/kg	0.1	<0.1
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	88
		d8-toluene (Surrogate)	%	-	89
		Bromofluorobenzene (Surrogate)	%	-	80
	Totals	Total BTEX	mg/kg	0.6	<0.6

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB242783.001	Monocyclic Aromatic Hydrocarbons	Benzene	µg/L	0.5	<0.5
		Toluene	µg/L	0.5	<0.5
		Ethylbenzene	µg/L	0.5	<0.5
		m/p-xylene	µg/L	1	<1
		o-xylene	µg/L	0.5	<0.5
	Polycyclic VOCs	Naphthalene (VOC)	µg/L	0.5	<0.5
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	95
		d8-toluene (Surrogate)	%	-	104
		Bromofluorobenzene (Surrogate)	%	-	101

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB242763.001		TRH C6-C9	mg/kg	20	<20
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	88

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB242783.001		TRH C6-C9	µg/L	40	<40
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	95
		d8-toluene (Surrogate)	%	-	104
		Bromofluorobenzene (Surrogate)	%	-	101

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE228928.030	LB242678.014	Mercury	µg/L	0.0001	<0.0001	<0.0001	200	197
SE228947.001	LB242678.016	Mercury	µg/L	0.0001	<0.0001	<0.0001	200	0

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE228890.004	LB242969.023	Mercury	mg/kg	0.05	<0.05	<0.05	200	0
SE228926.008	LB242969.014	Mercury	mg/kg	0.05	<0.05	<0.05	200	0

Moisture Content

Method: ME-(AU)-[ENV]AN002

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE228890.004	LB242855.019	% Moisture	%w/w	1	6.8	4.7	47	38
SE228926.010	LB242855.011	% Moisture	%w/w	1	9.2	10.4	40	13

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE228890.002	LB242757.023		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Lindane	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor	mg/kg	0.1	<0.1	<0.1	200	0
			Aldrin	mg/kg	0.1	<0.1	<0.1	200	0
			Beta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Delta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Dieldrin	mg/kg	0.2	<0.2	<0.2	200	0
			Endrin	mg/kg	0.2	<0.2	<0.2	200	0
			o,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	200	0
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Ketone	mg/kg	0.1	<0.1	<0.1	200	0
			Isodrin	mg/kg	0.1	<0.1	<0.1	200	0
			Mirex	mg/kg	0.1	<0.1	<0.1	200	0
			Total CLP OC Pesticides	mg/kg	1	<1	<1	200	0
			Total OC VIC EPA	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.16	0.16	30	1
SE228926.010	LB242757.014		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Lindane	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor	mg/kg	0.1	<0.1	<0.1	200	0
			Aldrin	mg/kg	0.1	<0.1	<0.1	200	0
			Beta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Delta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	200	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

OC Pesticides in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE228926.010	LB242757.014		p,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Dieldrin	mg/kg	0.2	<0.2	<0.2	200	0
			Endrin	mg/kg	0.2	<0.2	<0.2	200	0
			o,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	200	0
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Ketone	mg/kg	0.1	<0.1	<0.1	200	0
			Isodrin	mg/kg	0.1	<0.1	<0.1	200	0
			Mirex	mg/kg	0.1	<0.1	<0.1	200	0
			Total CLP OC Pesticides	mg/kg	1	<1	<1	200	0
			Total OC VIC EPA	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.17	0.16	30	3

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE228926.010	LB242757.014		Dichlorvos	mg/kg	0.5	<0.5	<0.5	200	0
			Dimethoate	mg/kg	0.5	<0.5	<0.5	200	0
			Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	200	0
			Fenitrothion	mg/kg	0.2	<0.2	<0.2	200	0
			Malathion	mg/kg	0.2	<0.2	<0.2	200	0
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	200	0
			Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	200	0
			Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	200	0
			Methidathion	mg/kg	0.5	<0.5	<0.5	200	0
			Ethion	mg/kg	0.2	<0.2	<0.2	200	0
			Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	200	0
			Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	200	0
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	4
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	2

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE228890.004	LB242757.021		Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthylene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluorene	mg/kg	0.1	<0.1	<0.1	200	0
			Phenanthrene	mg/kg	0.1	<0.1	<0.1	200	0
			Anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Chrysene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=0	mg/kg	0.2	<0.2	<0.2	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	mg/kg	0.3	<0.3	<0.3	134	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	mg/kg	0.2	<0.2	<0.2	175	0
			Total PAH (18)	mg/kg	0.8	<0.8	<0.8	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	30	3
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	0
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE228926.010	LB242757.014		Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthylene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluorene	mg/kg	0.1	<0.1	<0.1	200	0
			Phenanthrene	mg/kg	0.1	<0.1	0.3	82	102 ②
			Anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluoranthene	mg/kg	0.1	0.1	0.4	67	106 ②
			Pyrene	mg/kg	0.1	0.2	0.4	63	91 ②
			Benzo(a)anthracene	mg/kg	0.1	<0.1	0.2	102	70
			Chrysene	mg/kg	0.1	<0.1	0.2	109	59
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	0.2	100	68
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	189	0
			Benzo(a)pyrene	mg/kg	0.1	<0.1	0.2	108	56
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	0.1	159	4
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	0.1	152	5
			Carcinogenic PAHs, BaP TEQ <LOR=0	mg/kg	0.2	<0.2	0.2	176	19
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	mg/kg	0.3	<0.3	0.3	113	13
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	mg/kg	0.2	<0.2	0.3	107	37
			Total PAH (18)	mg/kg	0.8	<0.8	2.2	93	94 ②
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	30	2
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	4
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	2

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE228890.002	LB242757.023		Arochlor 1016	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1221	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1232	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1242	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1248	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1254	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1260	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1262	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1268	mg/kg	0.2	<0.2	<0.2	200	0
			Total PCBs (Arochlors)	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0	0	30	1
SE228926.010	LB242757.014		Arochlor 1016	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1221	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1232	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1242	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1248	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1254	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1260	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1262	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1268	mg/kg	0.2	<0.2	<0.2	200	0
			Total PCBs (Arochlors)	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0	0	30	3

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE228890.004	LB242964.023	Arsenic, As	mg/kg	1	5	5	48	1
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.5	10	10	35	1
		Copper, Cu	mg/kg	0.5	10	10	35	0
		Nickel, Ni	mg/kg	0.5	4.7	4.6	41	2
		Lead, Pb	mg/kg	1	14	14	37	0
		Zinc, Zn	mg/kg	2	24	23	38	1
SE228926.008	LB242964.014	Arsenic, As	mg/kg	1	5	4	52	13
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES (continued)

Method: ME-(AU)-[ENV]AN040/AN320

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE228926.008	LB242964.014	Chromium, Cr	mg/kg	0.5	6.6	6.8	37	2
		Copper, Cu	mg/kg	0.5	1.3	1.3	69	2
		Nickel, Ni	mg/kg	0.5	<0.5	0.6	126	11
		Lead, Pb	mg/kg	1	13	12	38	11
		Zinc, Zn	mg/kg	2	15	13	44	11

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE228924.004	LB242685.014	Copper, Cu	µg/L	1	2	2	68	0
SE228928.030	LB242685.019	Arsenic, As	µg/L	1	<1	<1	200	0
		Cadmium, Cd	µg/L	0.1	<0.1	<0.1	200	0
		Chromium, Cr	µg/L	1	<1	<1	200	0
		Copper, Cu	µg/L	1	<1	<1	200	0
		Lead, Pb	µg/L	1	<1	<1	200	0
		Nickel, Ni	µg/L	1	<1	<1	200	0
		Zinc, Zn	µg/L	5	<5	<5	200	0

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE228890.004	LB242757.021		TRH C10-C14	mg/kg	20	<20	<20	200	0
			TRH C15-C28	mg/kg	45	<45	<45	200	0
			TRH C29-C36	mg/kg	45	<45	<45	200	0
			TRH C37-C40	mg/kg	100	<100	<100	200	0
			TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
			TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	200	0
		TRH F Bands	TRH >C10-C16	mg/kg	25	<25	<25	200	0
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0
SE228926.010	LB242757.014		TRH C10-C14	mg/kg	20	<20	<20	200	0
			TRH C15-C28	mg/kg	45	<45	<45	200	0
			TRH C29-C36	mg/kg	45	<45	<45	200	0
			TRH C37-C40	mg/kg	100	<100	<100	200	0
			TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
			TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	200	0
		TRH F Bands	TRH >C10-C16	mg/kg	25	<25	<25	200	0
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE228926.015	LB242770.024		TRH C10-C14	µg/L	50	<50	<50	200	0
			TRH C15-C28	µg/L	200	<200	<200	200	0
			TRH C29-C36	µg/L	200	<200	<200	200	0
			TRH C37-C40	µg/L	200	<200	<200	200	0
			TRH C10-C40	µg/L	320	<320	<320	200	0
		TRH F Bands	TRH >C10-C16	µg/L	60	<60	<60	200	0
			TRH >C10-C16 - Naphthalene (F2)	µg/L	60	<60	<60	200	0
			TRH >C16-C34 (F3)	µg/L	500	<500	<500	200	0
			TRH >C34-C40 (F4)	µg/L	500	<500	<500	200	0

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE228890.004	LB242763.023	Monocyclic Aromatic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
			Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene (VOC)	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.3	8.3	50	1
			d8-toluene (Surrogate)	mg/kg	-	8.4	8.2	50	2
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.4	7.4	50	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

VOC's in Soil (continued)

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE228890.004	LB242763.023	Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	0
SE228926.010	LB242763.014	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
		Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene (VOC)	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.3	8.5	50	3
			d8-toluene (Surrogate)	mg/kg	-	7.9	8.3	50	6
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.0	7.3	50	4
		Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	0

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE229004.002	LB242783.023	Monocyclic	Benzene	µg/L	0.5	<0.5	<0.5	200	0
		Aromatic	Toluene	µg/L	0.5	<0.5	<0.5	200	0
			Ethylbenzene	µg/L	0.5	<0.5	<0.5	200	0
			m/p-xylene	µg/L	1	<1	<1	200	0
			o-xylene	µg/L	0.5	<0.5	<0.5	200	0
		Polycyclic	Naphthalene (VOC)	µg/L	0.5	<0.5	<0.5	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.9	9.5	30	14
			d8-toluene (Surrogate)	µg/L	-	4.2	9.7	30	80 ②
			Bromofluorobenzene (Surrogate)	µg/L	-	10.1	10.0	30	1

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE228890.004	LB242763.023		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.3	8.3	30	1
			d8-toluene (Surrogate)	mg/kg	-	8.4	8.2	30	2
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.4	7.4	30	0
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0
SE228926.010	LB242763.014		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.3	8.5	30	3
			d8-toluene (Surrogate)	mg/kg	-	7.9	8.3	30	6
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.0	7.3	30	4
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE229004.002	LB242783.023		TRH C6-C10	µg/L	50	<50	<50	200	0
			TRH C6-C9	µg/L	40	<40	<40	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.9	9.5	30	14
			d8-toluene (Surrogate)	µg/L	-	4.2	9.7	30	80 ②
			Bromofluorobenzene (Surrogate)	µg/L	-	10.1	10.0	30	1
		VPH F Bands	Benzene (F0)	µg/L	0.5	<0.5	<0.5	200	0
			TRH C6-C10 minus BTEX (F1)	µg/L	50	<50	<50	200	0

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB242969.002	Mercury	mg/kg	0.05	0.25	0.2	70 - 130	125

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB242757.002		Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	97
		Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	95
		Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	94
		Dieldrin	mg/kg	0.2	<0.2	0.2	60 - 140	94
		Endrin	mg/kg	0.2	<0.2	0.2	60 - 140	94
		p,p'-DDT	mg/kg	0.1	0.2	0.2	60 - 140	107
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.15	0.15	40 - 130	101

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB242757.002		Dichlorvos	mg/kg	0.5	1.7	2	60 - 140	87
		Diazinon (Dimpylate)	mg/kg	0.5	1.9	2	60 - 140	95
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	2.0	2	60 - 140	99
		Ethion	mg/kg	0.2	1.9	2	60 - 140	96
	Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	89
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	96

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB242757.002		Naphthalene	mg/kg	0.1	4.1	4	60 - 140	101
		Acenaphthylene	mg/kg	0.1	3.8	4	60 - 140	95
		Acenaphthene	mg/kg	0.1	3.8	4	60 - 140	95
		Phenanthrene	mg/kg	0.1	4.1	4	60 - 140	104
		Anthracene	mg/kg	0.1	3.8	4	60 - 140	96
		Fluoranthene	mg/kg	0.1	3.9	4	60 - 140	96
		Pyrene	mg/kg	0.1	4.1	4	60 - 140	103
		Benzo(a)pyrene	mg/kg	0.1	4.0	4	60 - 140	101
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	99
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	89
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	96

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB242757.002	Arochlor 1260	mg/kg	0.2	0.4	0.4	60 - 140	103

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB242964.002	Arsenic, As	mg/kg	1	310	318.22	80 - 120	97
	Cadmium, Cd	mg/kg	0.3	4.3	4.81	70 - 130	90
	Chromium, Cr	mg/kg	0.5	34	38.31	80 - 120	90
	Copper, Cu	mg/kg	0.5	300	290	80 - 120	104
	Nickel, Ni	mg/kg	0.5	180	187	80 - 120	97
	Lead, Pb	mg/kg	1	88	89.9	80 - 120	98
	Zinc, Zn	mg/kg	2	260	273	80 - 120	97

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB242685.002	Arsenic, As	µg/L	1	18	20	80 - 120	92
	Cadmium, Cd	µg/L	0.1	20	20	80 - 120	99
	Chromium, Cr	µg/L	1	20	20	80 - 120	101
	Copper, Cu	µg/L	1	20	20	80 - 120	100
	Lead, Pb	µg/L	1	20	20	80 - 120	98
	Nickel, Ni	µg/L	1	21	20	80 - 120	104
	Zinc, Zn	µg/L	5	21	20	80 - 120	107

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB242757.002		TRH C10-C14	mg/kg	20	44	40	60 - 140	110
		TRH C15-C28	mg/kg	45	45	40	60 - 140	113
		TRH C29-C36	mg/kg	45	<45	40	60 - 140	98
	TRH F Bands	TRH >C10-C16	mg/kg	25	45	40	60 - 140	113
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	108
		TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	100

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB242770.002		TRH C10-C14	µg/L	50	1100	1200	60 - 140	92
		TRH C15-C28	µg/L	200	1300	1200	60 - 140	111
		TRH C29-C36	µg/L	200	1500	1200	60 - 140	122
	TRH F Bands	TRH >C10-C16	µg/L	60	1500	1200	60 - 140	121
		TRH >C16-C34 (F3)	µg/L	500	1500	1200	60 - 140	124
		TRH >C34-C40 (F4)	µg/L	500	710	600	60 - 140	119

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB242763.002	Monocyclic	Benzene	mg/kg	0.1	4.5	5	60 - 140	91
	Aromatic	Toluene	mg/kg	0.1	4.5	5	60 - 140	90
		Ethylbenzene	mg/kg	0.1	4.7	5	60 - 140	93
		m/p-xylene	mg/kg	0.2	9.1	10	60 - 140	91
		o-xylene	mg/kg	0.1	5.0	5	60 - 140	100
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.3	10	70 - 130	93
		d8-toluene (Surrogate)	mg/kg	-	9.4	10	70 - 130	94
		Bromofluorobenzene (Surrogate)	mg/kg	-	8.0	10	70 - 130	80

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB242783.002	Monocyclic	Benzene	µg/L	0.5	52	45.45	60 - 140	115
	Aromatic	Toluene	µg/L	0.5	50	45.45	60 - 140	110
		Ethylbenzene	µg/L	0.5	46	45.45	60 - 140	102
		m/p-xylene	µg/L	1	95	90.9	60 - 140	104
		o-xylene	µg/L	0.5	49	45.45	60 - 140	108
	Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	9.8	10	60 - 140	98
		d8-toluene (Surrogate)	µg/L	-	10.8	10	70 - 130	108
		Bromofluorobenzene (Surrogate)	µg/L	-	10.1	10	70 - 130	101

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB242763.002		TRH C6-C10	mg/kg	25	66	92.5	60 - 140	71
		TRH C6-C9	mg/kg	20	59	80	60 - 140	74
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	11.2	10	70 - 130	112
		Bromofluorobenzene (Surrogate)	mg/kg	-	8.0	10	70 - 130	80
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	38	62.5	60 - 140	61

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB242783.002		TRH C6-C10	µg/L	50	910	946.63	60 - 140	96
		TRH C6-C9	µg/L	40	790	818.71	60 - 140	96
	Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	9.8	10	60 - 140	98
		d8-toluene (Surrogate)	µg/L	-	10.8	10	70 - 130	108
		Bromofluorobenzene (Surrogate)	µg/L	-	10.1	10	70 - 130	101
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	µg/L	50	610	639.67	60 - 140	96

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE229115.001	LB242969.004	Mercury	mg/kg	0.05	0.27	0.05	0.2	108

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE228926.001	LB242757.004		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha BHC	mg/kg	0.1	<0.1	<0.1	-	-
			Lindane	mg/kg	0.1	<0.1	<0.1	-	-
			Heptachlor	mg/kg	0.1	0.2	<0.1	0.2	101
			Aldrin	mg/kg	0.1	0.2	<0.1	0.2	97
			Beta BHC	mg/kg	0.1	<0.1	<0.1	-	-
			Delta BHC	mg/kg	0.1	0.2	<0.1	0.2	100
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	-	-
			o,p'-DDE	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	-	-
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	-	-
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	-	-
			p,p'-DDE	mg/kg	0.1	<0.1	<0.1	-	-
			Dieldrin	mg/kg	0.2	<0.2	<0.2	0.2	96
			Endrin	mg/kg	0.2	0.2	<0.2	0.2	107
			o,p'-DDD	mg/kg	0.1	<0.1	<0.1	-	-
			o,p'-DDT	mg/kg	0.1	<0.1	<0.1	-	-
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	-	-
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	-	-
			p,p'-DDT	mg/kg	0.1	0.2	<0.1	0.2	98
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	-	-
			Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	-	-
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	-	-
			Endrin Ketone	mg/kg	0.1	<0.1	<0.1	-	-
			Isodrin	mg/kg	0.1	<0.1	<0.1	-	-
			Mirex	mg/kg	0.1	<0.1	<0.1	-	-
			Total CLP OC Pesticides	mg/kg	1	1	<1	-	-
			Total OC VIC EPA	mg/kg	1	1	<1	-	-
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.16	0.15	-	104

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE228926.001	LB242757.004		Dichlorvos	mg/kg	0.5	1.7	<0.5	2	85
			Dimethoate	mg/kg	0.5	<0.5	<0.5	-	-
			Diazinon (Dimpylate)	mg/kg	0.5	1.9	<0.5	2	93
			Fenitrothion	mg/kg	0.2	<0.2	<0.2	-	-
			Malathion	mg/kg	0.2	<0.2	<0.2	-	-
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	2.1	<0.2	2	104
			Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	-	-
			Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	-	-
			Methidathion	mg/kg	0.5	<0.5	<0.5	-	-
			Ethion	mg/kg	0.2	2.2	<0.2	2	111
			Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	-	-
			Total OP Pesticides*	mg/kg	1.7	7.9	<1.7	-	-
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	-	92
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	-	97

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE228926.001	LB242757.004	Naphthalene	mg/kg	0.1	4.0	<0.1	4	100
		2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		Acenaphthylene	mg/kg	0.1	3.8	<0.1	4	92
		Acenaphthene	mg/kg	0.1	3.7	<0.1	4	92
		Fluorene	mg/kg	0.1	<0.1	<0.1	-	-

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE228926.001	LB242757.004		Phenanthrene	mg/kg	0.1	4.9	0.2	4	116
			Anthracene	mg/kg	0.1	3.9	<0.1	4	95
			Fluoranthene	mg/kg	0.1	5.8	0.6	4	131
			Pyrene	mg/kg	0.1	6.0	0.6	4	136
			Benzo(a)anthracene	mg/kg	0.1	1.2	0.4	-	-
			Chrysene	mg/kg	0.1	1.0	0.3	-	-
			Benzo(b&j)fluoranthene	mg/kg	0.1	1.0	0.4	-	-
			Benzo(k)fluoranthene	mg/kg	0.1	0.4	0.2	-	-
			Benzo(a)pyrene	mg/kg	0.1	4.9	0.3	4	113
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	0.5	0.2	-	-
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(ghi)perylene	mg/kg	0.1	0.4	0.2	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	5.2	0.5	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	5.3	0.6	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	5.2	0.5	-	-
			Total PAH (18)	mg/kg	0.8	41	3.3	-	-
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	-	98
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	-	92
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	-	97

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE228926.001	LB242757.004		Arochlor 1016	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1221	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1232	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1242	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1248	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1254	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1260	mg/kg	0.2	0.4	<0.2	0.4	105
			Arochlor 1262	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1268	mg/kg	0.2	<0.2	<0.2	-	-
			Total PCBs (Arochlors)	mg/kg	1	<1	<1	-	-
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0	0	-	104

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE229115.001	LB242964.004	Arsenic, As	mg/kg	1	57	9	50	97
		Cadmium, Cd	mg/kg	0.3	44	<0.3	50	89
		Chromium, Cr	mg/kg	0.5	58	7.5	50	102
		Copper, Cu	mg/kg	0.5	100	16	50	167 ④
		Nickel, Ni	mg/kg	0.5	54	7.1	50	93
		Lead, Pb	mg/kg	1	110	36	50	140 ④
		Zinc, Zn	mg/kg	2	160	47	50	222 ④

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE228865.001	LB242685.004	Zinc, Zn	µg/L	5	45	23	20	109

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE228926.001	LB242757.004		TRH C10-C14	mg/kg	20	49	<20	40	123
			TRH C15-C28	mg/kg	45	55	<45	40	103
			TRH C29-C36	mg/kg	45	<45	<45	40	105
			TRH C37-C40	mg/kg	100	<100	<100	-	-
			TRH C10-C36 Total	mg/kg	110	<110	<110	-	-
			TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	-	-
		TRH F	TRH >C10-C16	mg/kg	25	50	<25	40	125
		Bands	TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	50	<25	-	-
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	40	88
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	-	-

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE228926.001	LB242763.004	Monocyclic	Benzene	mg/kg	0.1	4.1	<0.1	5	82
		Aromatic	Toluene	mg/kg	0.1	4.0	<0.1	5	81
			Ethylbenzene	mg/kg	0.1	4.2	<0.1	5	84
			m/p-xylene	mg/kg	0.2	8.2	<0.2	10	82
			o-xylene	mg/kg	0.1	4.5	<0.1	5	89
		Polycyclic	Naphthalene (VOC)	mg/kg	0.1	<0.1	<0.1	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.1	7.7	10	81
			d8-toluene (Surrogate)	mg/kg	-	8.0	7.4	10	80
			Bromofluorobenzene (Surrogate)	mg/kg	-	6.9	6.6	10	69 ①
		Totals	Total Xylenes	mg/kg	0.3	13	<0.3	-	-
			Total BTEX	mg/kg	0.6	25	<0.6	-	-

VOCs in Water

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE228903.001	LB242783.024	Monocyclic	Benzene	µg/L	0.5	52	<0.5	45.45	113
		Aromatic	Toluene	µg/L	0.5	50	<0.5	45.45	110
			Ethylbenzene	µg/L	0.5	50	<0.5	45.45	111
			m/p-xylene	µg/L	1	100	<1	90.9	111
			o-xylene	µg/L	0.5	51	<0.5	45.45	111
		Polycyclic	Naphthalene (VOC)	µg/L	0.5	49	<0.5	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	8.0	11.1	-	80
			d8-toluene (Surrogate)	µg/L	-	8.9	10.0	-	89
			Bromofluorobenzene (Surrogate)	µg/L	-	10.1	10.1	-	101

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE228926.001	LB242763.004		TRH C6-C10	mg/kg	25	71	<25	92.5	76
			TRH C6-C9	mg/kg	20	64	<20	80	79
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.1	7.7	10	81
			d8-toluene (Surrogate)	mg/kg	-	8.0	7.4	10	80
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.7	6.6	-	97
		VPH F	Benzene (F0)	mg/kg	0.1	4.1	<0.1	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	46	<25	62.5	73

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE228903.001	LB242783.024		TRH C6-C10	µg/L	50	930	<50	946.63	98
			TRH C6-C9	µg/L	40	810	<40	818.71	99
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	0.0	11.1	-	80
			d8-toluene (Surrogate)	µg/L	-	0.0	10.0	-	89
			Bromofluorobenzene (Surrogate)	µg/L	-	0.0	10.1	-	101
		VPH F	Benzene (F0)	µg/L	0.5		<0.5	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	µg/L	50	620	<50	639.67	98

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The original result is the analyte concentration of the matrix spike. The Duplicate result is the analyte concentration of the matrix spike duplicate.

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

QC criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found here: https://www.sgs.com.au/~/media/Local/Australia/Documents/Technical Documents/MP-AU-ENV-QU-022 QA QC Plan.pdf

*	NATA accreditation does not cover the performance of this service.
**	Indicative data, theoretical holding time exceeded.
***	Indicates that both * and ** apply.
-	Sample not analysed for this analyte.
IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
LOR	Limit of reporting.
QFH	QC result is above the upper tolerance.
QFL	QC result is below the lower tolerance.
①	At least 2 of 3 surrogates are within acceptance criteria.
②	RPD failed acceptance criteria due to sample heterogeneity.
③	Results less than 5 times LOR preclude acceptance criteria for RPD.
④	Recovery failed acceptance criteria due to matrix interference.
⑤	Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
⑥	LOR was raised due to sample matrix interference.
⑦	LOR was raised due to dilution of significantly high concentration of analyte in sample.
⑧	Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
⑨	Recovery failed acceptance criteria due to sample heterogeneity.
⑩	LOR was raised due to high conductivity of the sample (required dilution).
†	Refer to relevant report comments for further information.