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PALMDEV PTY LTD



Detailed Site Investigation


1112-1116 Barrenjoey Road, Palm Beach NSW

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Executive Summary

Background

Palmdev Pty Ltd engaged EI Australia (EI) to conduct a Detailed Site Investigation (DSI) for the industrial property located at 1112-1116 Barrenjoey Road, Palm Beach NSW ('the site'). This DSI was completed as part of the Development Application process through Northern Beaches Council for the redevelopment of the site to enable the developer to meet its obligations under the *Contaminated Land Management Act 1997* (CLM Act), for the assessment and management of contaminated soil and/or groundwater.

The site is located approximately 32km north of the Sydney central business district. The site is identified as Lot 21 in DP571298 and is situated within the Local Government Area of Northern Beaches Council. The site covers a total area of approximately 1,400 m².

It is understood that the site is currently occupied by a general store, ferry tickets store and boutique hotel, which are commercial land uses. Due to the confidentiality of matters related to the site, the proposed development was not disclosed, however it is understood that the client intends to purchase the property for future development. For the purposes of this DSI, it has been conservatively assumed that the proposed development is high density residential.

Objectives

The main objectives of the assessment were to:

- Evaluate the potential for site contamination on the basis of historical land uses, anecdotal and documentary evidence of possible pollutant sources;
- To investigate the degree of any potential contamination by means of limited intrusive sampling and laboratory analysis, for relevant contaminants;
- Provide a conclusion regarding suitability of the site for the proposed development ; and
- Where site contamination is confirmed, make recommendations for the appropriate management of any contaminated soils and/or groundwater.

Findings

The work was conducted with reference to the regulatory framework outlined in Section 1.3 of this report and assessment findings indicated the following:

- The site is located approximately 32km north of the Sydney central business district and is situated within the Local Government Area of Northern Beaches Council. The site is identified as Lot 21 in DP571298 and occupies a total area of approximately 1,400 m² presented in **Figure 2 (Appendix A)**;
- The allotment known as 1112-1116 Barrenjoey Road, Palm Beach NSW appears to have been used for residential purpose until 1979. The site was redeveloped for commercial purposes after 1979;
- An application to access records held by Northern Beaches Council was still pending at the time of report writing. Should pertinent information be identified upon receipt of Council records, an addendum to the DSI will be prepared and issued;
- A search of SafeWork NSW records did not identify records pertaining to dangerous goods or UPSS for the site;

- The site was free of statutory notices issued by the EPA, and was not recorded on the List of NSW Contaminated Sites Notified to EPA;
- Soil sampling and analysis were conducted at six borehole locations. The sampling regime was considered to be appropriate for detailed investigation purposes and comprised a generally systematic (triangular grid) sampling pattern within accessible areas and with allowance for structural obstacles (e.g. buildings, services, and other physical obstructions in use by existing operating businesses);
- Soil sample results reported Asbestos in shallow fill at EBH103 and EBH104;
- Soil sample results reported zinc in shallow fill at EBH103 at a concentration that exceeded adopted Ecological-based Investigation Levels (EILs);
- The asbestos and zinc report in shallow fill is likely due to weathering fallout from the adjacent building and therefore localised;
- Chromium, copper, nickel and zinc were reported in groundwater at concentrations exceeding adopted ecological criteria (marine). Chromium, copper and zinc were reported at relatively low concentrations there were typical of background conditions of urban environments. Nickel was reported at elevated concentration; however, low concentrations in soil indicate that the site is unlikely to be contributing to the reported concentration in groundwater;
- Minor petroleum hydrocarbon (as TRH-F2) was reported in groundwater, This presents a low risk to human health and ecological receptors;
- Soils were assessed for acid sulfate soils, and were not found to be actual or potential acid sulfate soils; and
- Based on the analytical results, the following preliminary classifications were provided (with reference to the EPA (2014) *Waste Classification Guidelines*):
 - The fill materials in the vicinity of EBH103 and EBH104 can be classified as *General Solid Waste (GSW) / Asbestos Waste* and remaining fill on the site can be classified as *General Solid Waste (GSW)*;
 - The underlying natural soils on the site can be classified as *Virgin Excavated Natural Material (VENM)*.

Conclusions and Recommendations

Based on the findings of this DSI, which was conducted in accordance with the investigation scope agreed with the Client, and with consideration of the Statement of Limitations (**Section 13**), bonded asbestos was identified which will require delineation and remediation in fill at EBH103 and EBH104.

EI note that the site contamination issues can be managed through the development application process in accordance with the State Environmental Planning Policy 55 (SEPP 55) – Remediation of Land, with the requirements for further investigation, remediation, and validation incorporated into conditions of development consent.

EI consider that the site can be made suitable for the proposed development, subject to the following recommendations being implemented during development:

- Conduct a Hazardous Materials Survey (HMS) of current site structures prior to demolition works;

- Clearance Inspection should be conducted following site building demolition and removal of all asbestos impacted fill in the vicinity of EBH103 and EBH104;
- Any soil materials being removed from site (including virgin excavated natural materials or VENM) be classified for off-site disposal in accordance with the EPA (2014) Waste Classification Guidelines;
- Dewatering may be required if the proposed development includes construction of a basement. This would require:
 - Preparation of a Dewatering Management Plan (DMP) and approval from local Council and WaterNSW;
 - On-going monitoring during any dewatering in accordance with the DMP; and
 - Following completion of dewatering preparation of a Dewatering Completion Report summarising the on-going monitoring works.

1. Introduction

1.1 Background and Purpose

Palmdev Pty Ltd engaged EI Australia (EI) to conduct a Detailed Site Investigation (DSI) for the property located at 1112-1116 Barrenjoey Road, Palm Beach NSW ('the site').

As shown in **Figure A.1**, The site is located approximately 32km north of the Sydney central business district. The site is identified as Lot 21 in DP571298 and is situated within the Local Government Area of Northern Beaches Council. The site covers a total area of approximately 1,400 m² as depicted in the site plan presented as **Figure A.2**.

This assessment was conducted in support of a Development Application (DA) to Northern Beaches Council for proposed redevelopment of the site.

1.2 Proposed Development

It is understood that the site is currently occupied by a general store, ferry tickets store and boutique hotel, which are commercial land uses. Due to the confidentiality of matters related to the site, the proposed development was not disclosed however it is understood that the client intends to purchase the property for future development which will include a one level basement. For the purposes of this DSI, it has been conservatively assumed that the proposed development is high density residential.

1.3 Regulatory Framework

The following regulatory framework and guidelines were considered during the preparation of this report:

- ANZG (2018) Australian and New Zealand Guidelines for Fresh and Marine Water Quality;
- DEC (2007) Guidelines for the Assessment and Management of Groundwater Contamination;
- Pittwater Local Environmental Plan 2014;
- EPA (2017) Guidelines for the NSW Site Auditor Scheme (3rd Edition);
- EPA (1995) Sampling Design Guidelines;
- NEPM (2013) Schedule B(1) Guideline on Investigation Levels for Soil and Groundwater;
- NEPM (2013) Schedule B(2) Guideline on Site Characterisation;
- Contaminated Land Management Act 1997;
- State Environment Protection Policy 55 (SEPP 55) – *Remediation of Land*; and
- OEH (2011) Guidelines for Consultants Reporting on Contaminated Sites.

1.4 Project Objectives

The primary 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;

- To investigate the degree of any potential contamination by means of limited intrusive sampling and laboratory analysis, for relevant contaminants;
- Provide a conclusion regarding suitability of the site for the proposed development; and
- Where site contamination is confirmed, make recommendations for the appropriate management of any contaminated soils and/or groundwater.

1.5 Scope of Works

In order to achieve the above objectives, the scope of works was as follows:

1.5.1 Desktop Study

- A review of relevant topographical, geological, hydrogeological and soil landscape maps for the project area;
- A search of NSW EPA Land Information records under the Contaminated Land Management Act 1997 and Protection of the Environment Operations Act 1997;
- A preparation of a Work, Health, Safety & Environment Plan.
- Search of historical aerial photographs archived at NSW Land and Property Information to review previous site use and the historical sequence of land development in the neighbouring area;
- A search of SafeWork NSW records for information relating to possible underground tank approvals and locations;
- A search of Northern Beaches Council records for information relating to operational site history and/or relevant environmental incidents;
- A land titles search, also conducted through NSW Land and Property Information for information relating to historical ownership of the site; and
- A review of existing underground services on site.

1.5.2 Field Work & Laboratory Analysis

- A detailed site walkover inspection;
- Construction of test boreholes at six (6) locations distributed in accessible areas of the site;
- Construction of one (1) groundwater monitoring bore. Groundwater monitoring bore will be constructed to standard environmental protocols to investigate the potential for groundwater contamination, and migration of contaminants off-site;
- Multiple level soil sampling within fill and natural soils and one round of groundwater sampling from the four newly constructed groundwater monitoring bore; and
- Laboratory analysis of selected soil and groundwater samples for relevant analytical parameters as determined from the site history survey and field observations during the investigation programme.

1.5.3 Data Analysis and Reporting

This DSI report has been prepared to document desk study findings, the conceptual site model, data quality objectives, investigation methodologies and results. The report also provides a record of observations made during the detailed 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 uses 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**, while the site locality is shown in **Appendix A - Figure 1**.

Table 2-1 Site Identification, Location and Zoning

Attribute	Description
Street Address	1112-1116 Barrenjoey Road, Palm Beach NSW
Location Description	Site is located 32 km north of the Sydney central business district, bound by Residential properties (north and east), Barrenjoey Road (west) and a restaurant (south).
Coordinates	North-west corner of site (GDA94-MGA56): Easting: 344160.515 Northing: 6281321.408 (Source: http://maps.six.nsw.gov.au)
Site Area	Approx. 1,400 m ²
Lot and Deposited Plan (DP)	Lot 21 in DP571298
State Survey Marks	One State Survey Mark (SSM) and two Permanent Marks (PM) situated in close proximity (<200 m) to the site: <ul style="list-style-type: none"> ▪ SS38192 within the public car park (approx. 66 m southwest); ▪ PM52391 on the Barrenjoey Road (approx. 4 m northwest); and ▪ PM52392 on the corner of Palm Beach Road and Pacific Road (approx. 79 m southeast). (Source: http://maps.six.nsw.gov.au)
Local Government Authority	Northern Beaches Council
Parish	Narrabeen
County	Cumberland
Current Zoning	B1: Neighbourhood Centre (Pittwater Local Environmental Plan 2014)
Current Land Uses	Commercial

2.2 Surrounding Land Use

The site is situated within an area of mixed commercial and industrial area. Current uses of surrounding land are described in **Table 2-2**.

Table 2-2 Surrounding Land Uses

Direction Relative to Site	Land Use Description	Sensitive Land Receptors
North	Residential properties	▪ Local residence (directly adjacent)
South	Restaurant (Barrenjoey House), followed by residential properties	▪ Commercial properties (directly adjacent)
West	Barrenjoey Road, followed by car park then Pittwater	▪ Pittwater (65 m west)
East	Residential properties	▪ Local residence (directly adjacent)

2.3 Regional Setting

Regional topography, geology, soil landscape and hydrogeological information are summarised in **Table 2-3**.

Table 2-3 Regional Setting Information

Attribute	Description
Topography	The western portion of the site was located within generally flat topography. The eastern portion of the site was on a steep slope.
Site Drainage	Also, stormwater is likely to flow to the west and north, consistent with the general slope of the site, via drainage systems discharging to various stormwater easements and the municipal stormwater system. Stormwater is assumed to ultimately discharge at Snapperman Beach and Pittwater West of the site
Regional Geology	With reference to the Department of Mineral Resources Geological Map Sydney 1:100,000 Geological Series Sheet 9130 (DMR 1983) indicates the site is underlain by Newport Formation (Rnn) of the Upper Narrabeen Group. Newport Formation (Upper Narrabeen Group) is of middle Triassic Age and typically comprises interbedded laminite, shale and quartz to lithic quartz sandstones and pink clay pellet sandstones.
Soil Landscapes	The Soil Conservation Service of NSW Soil Landscapes of the Sydney 1:100,000 Sheet (Chapman and Murphy, 1989) indicates that the site is underlain by colluvial Watagan (wn) soil, which typically includes rolling to very steep hills on fine-grained Narrabeen Group sediments. Local relief 60–120 m, slopes >25%. Narrow, convex crests and ridges, steep colluvial sideslopes, occasional sandstone boulders and benches. Tall eucalypt open-forest with closed-forest (rainforest) in sheltered positions
Acid Sulfate Soil Risk	With reference to the Broken Bay Acid Sulfate Soil Risk Map (1:25,000 scale; Murphy, 1997), the subject land lies within the map class description of 'No Known Occurrence'. With reference to the Pittwater Local Environmental Plan 2014 Acid Sulfate Soils (ASS) map (ASS-015) the site is mapped as Class 5 Acid Sulfate Soils. In such cases, acid sulfate soils (ASS) are not known or expected to occur and "land management activities are not likely to be affected by ASS materials."

Attribute	Description
Typical Soil Profile	Fill – Silty sand, fine to medium grained, brown, with rootlets, brick, sandstone and gravel, no odour; and Topsoil – Silty sand, medium to coarse grained, dark grey, with rootlets, brick, tile and sandstone fragment.
Depth to Groundwater	Groundwater was encountered at 1.0 mBTC during the groundwater investigation. Onsite groundwater conditions, including groundwater flow direction, are discussed in Section 8.2 .
Nearest Surface Water Feature	Snapperman Beach and Pittwater, which is located approximately 65 m west of the site.
Groundwater Flow Direction	Groundwater flow direction in the vicinity of the site is inferred to be west towards Snapperman Beach towards Pittwater.

2.4 Groundwater Bore Records and Groundwater Use

An online search of registered groundwater bores was conducted on the 1 July 2021 via the WaterNSW groundwater bore database (<https://realtimedata.watarnsw.com.au/water.stm>). A total of 19 registered bores were identified within a 500 m radius of the site. The five closest bores were summarised in **Table 2-4**. A bore location plan and detailed information regarding the listed bores is attached in **Appendix C**.

Table 2-4 Summary of Registered Water Bores within 500 m of the site

Bore No.	Date Drilled	Drilled Depth (m)	SWL*/Salinity/Yield	Bore Purpose
GW105823	15/03/2004	4.0	2.0 / Good / 0.5	Domestic
GW112524	15/05/2013	4.3	1.75 / - / 1.0	Domestic
GW110407	01/01/1994	6.3	- / - / -	Domestic
GW106383	24/09/2004	4.0	2.0 / - / 0.5	Domestic
GW105595	05/11/2003	5.0	2.5 / Good / 0.5	Domestic

Notes: NA - Data not recorded; * SWL – Standing water level measured in m BGL, Salinity – units unspecified, Yield measured in L/s.

All listed registered bores were recorded as authorised domestic bore. The drilled bore depths ranging from 4.0 to 6.3 mBGL. The standing water levels of the water table ranging from 1.75 to 2.5 mBGL.

2.5 Site Walkover Inspection

Site observations were recorded during a site walkover inspection of the site conducted on 18 June 2021. The summary of site observations is detailed below.

With reference to the photographs taken during the inspection (Ref. **Appendix D**), pertinent site observations were summarised as follows:

- The western portion of the site was occupied by a single level brick commercial building with associated gravel car park. The north-eastern portion of the site was occupied by a timber residential house / guest house. The eastern portion of the site was covered by dense bamboo bush on a very steep slope;

- The building structures appeared to be in moderate condition with minor weathering of painted surfaces and / or metallic surfaces observed. Fibro-cement pieces (potential ACM) were observed near the timber house on the slope land;
- No unusual odours were detected during the inspection; and
- No evidence of Underground Storage Tanks (USTs) or Underground Petroleum Storage System (UPSSs) or Above-ground Storage Tanks (ASTs) was observed.

3. Previous Investigations

EI are unaware of any other previous environmental investigations that may have been completed for the site.

4. Site History

4.1 Land Titles Information / Historic Aerial Review

A historical land titles search was conducted through InfoTrack Pty Ltd. Copies of relevant documents resulting from this search are presented in **Appendix E**. A summary of all the previous and current registered proprietors along with information obtained from the available historical aerial photographs, in relation to past potential land uses are presented in **Table 4-1**. The historical aerial photographs reviewed as part of this DSI included:

- 1947: Broken Bay Run 44, Jan 1947, LANDSPHOTO;
- 1951: NSW 471-4
- 1961: NSW 1057 5153;
- 1972: NSW 2015 5078;
- 1986: NSW 3534 204;
- 1998: NSW 4454 R03 M2141;
- 2005: NSW 4941 R03 M2510; and
- 2020: Google Earth.

Table 4-1 Summary of Owners and Historical Aerial Photography

Period	Ownership Summary	Site description based on historical aerial photographs	Potential Land Uses
1918 to 1969	Private Owners	1943: The site buildings appear to be established. An extra building was located at current carpark area. The surrounding area was low density residential properties and bush land; 1951, 1961: The lot appears unchanged from the previous aerial photograph.	Residential
1969 to 1981	Cantec Pty Limited J.A. Atkinson Pty Limited	1972: The lot appears unchanged from the previous aerial photograph.	Commercial
1981 to date	# Harry Anastasopoulos # Maria Anastasopoulos # Tony Anastasopoulos Now # Anastasios Anastasopoulos)	1986: The original building in southern portion of the site was demolished. A new public car park was built to the west of the site (opposite side of Barrenjoey Road). More residential properties were established in the surrounding area; 1998, 2005 and 2020: The lot appears unchanged from the previous aerial photograph.	Commercial/ Residential

Denotes current registered proprietor

Overall, the allotment known as 1112-1116 Barrenjoey Road, Palm Beach NSW appears to have been used for residential purposes until 1969. Part of the site was redeveloped for commercial purposes after 1969.

4.2 Council Information

An application to access records held by Northern Beaches Council was still pending at the time of report writing. Should pertinent information be identified upon receipt of Council records, an addendum to the DSI will be prepared and issued.

4.3 SafeWork NSW Dangerous Goods Register Records

A search of SafeWork NSW records did not identify records pertaining to dangerous goods or UPSS for the site. Correspondence from SafeWork NSW is presented in **Appendix F**.

4.4 EPA Records

4.4.1 Contaminated Land – Record of Notices under Section 58 of CLM Act (1997)

An on-line search of the contaminated land public record of EPA Notices was conducted on 1 July 2021. The contaminated land public record is a searchable database of:

- Orders made under Part 3 of the *Contaminated Land Management Act 1997* (CLM Act);
- Notices available to the public under Section 58 of the CLM Act;
- Approved voluntary management proposals under the CLM Act that have not been fully carried out and where the approval of the Environment Protection Authority (EPA) has not been revoked;
- Site audit statements provided to the NSW EPA under section 53B of the CLM Act that relate to significantly contaminated land;
- Where practicable, copies of anything formerly required to be part of the public record; and
- Actions taken by NSW EPA under section 35 or 36 of the *Environmentally Hazardous Chemicals Act 1985* (EHC Act).

The search confirmed that the site known as 1112-1116 Barrenjoey Road, Palm Beach NSW and surrounding lands within close proximity (within 250 m) were not subject to any regulatory notices relevant to the above legislation.

4.4.2 List of NSW Contaminated Sites Notified to EPA

A search through the List of NSW Contaminated Sites notified to the EPA under Section 60 of the CLM Act 1997 was conducted on 1 July 2021. This list is maintained by NSW EPA and includes properties on which contamination has been identified. Not all notified land is deemed to be impacted significantly enough to warrant regulation by the NSW EPA. The site or localities in proximity (≤ 250 m) to the site have not been notified as contaminated to the EPA.

4.4.3 POEO Public Register

A search of the Protection of the Environment Operations (POEO) Act public register was conducted on 1 July 2021. The public register contains records related to environmental protection licences, applications, notices, audits, pollution studies, and reduction programmes. The search for Palm Beach, Whale Beach and Avalon Beach did not identify any record for the site or sites in proximity (≤ 500 m).

5. Conceptual Site Model

In accordance with NEPM (2013) *Schedule B2 – Guideline on Site Characterisation* and to aid in the assessment of data collection for the site, EI developed a conceptual site model (CSM) assessing plausible pollutant linkages between potential contamination sources, migration pathways and receptors. The CSM provides a framework for the review of the reliability and useability of the data collected and to identify data gaps in the existing site characterisation.

5.1 Potential Contamination Sources

On the basis of site history and search findings (described in **Section 4**) EI consider potential chemical hazards and onsite contamination sources to be:

- Importation of fill of unknown origin and quality placed at the site;
- Weathering of exposed building fabrics, painted surfaces and metallic objects from site structures;
- Possible uncontrolled demolition of former site structures resulting in contamination of surface soils by hazardous building materials;
- Leakage from parked vehicles on site; and
- Potential on-site use of pesticides.

5.2 PFAS Assessment

EPA (2017) requires that PFAS are considered when investigating land contamination. A desktop survey of the probability for PFAS occurrence is provided in **Table 5-2**. This survey is based on guidelines from the *PFAS National Environmental Management Plan* (NEMP 2018). From this survey a decision can be made as to whether PFAS sampling of soil and groundwater is required.

Table 5-2 PFAS Decision Tree

Preliminary Screening	Probability of Occurrence ¹
Is the past or present site activity listed in the NEMP 2.0 (2020) ² an activity with risk of fire. If so list activity.	L
Is the past or present off-site activity up-gradient or adjacent to the site listed in the NEMP 2.0 (2020) ² an activity with risk of fire. 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 of 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 activity listed in NEMP (2018)?	L
Could PFAS-contaminated groundwater or run-off have migrated on to the site?	L
Is the site or any adjacent site listed in the NSW EPA PFAS Investigation Program? ⁵	L

Preliminary Screening	Probability of Occurrence ¹
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?	-
<p>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).</p> <p>Note 2 Activities listed in Appendix B of the NEMP 2.0 (2020). (https://www.oecd.org/env/ehs/risk-management/PFC_FINAL-Web.pdf)</p> <p>Note 3 Runoff from up-gradient PFAS use may impact surface water, soil, sediment and groundwater.</p> <p>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)</p> <p>Note 5 Refer to https://www.epa.nsw.gov.au/your-environment/contaminated-land/pfas-investigation-program.</p>	

5.3 Emerging chemicals

The EPA uses Chemical Control Orders (CCOs) as a primary legislative tool under the EHC 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 5-3**.

In this instance, the potential for an emerging chemical of concern to be present on-site was low and subsequently corresponding sampling / analysis of soil and water was unwarranted.

Table 5-3 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 have the potential to impact the site (CCO, 1986)? ¹	No
Were organotin products used or stored on site (CCO, 1989)? ²	No
Were polychlorinated biphenyls (PCBs) used or PCB wastes stored on-site (CCO, 1997)? ³	No
Were scheduled chemical or wastes used or stored (CCO, 2004)? ⁴	No
Are other emerging chemicals suspected? ⁵	No
If Yes to any questions, has site sampling suite been optimised to include specific sampling for other chemicals of concern in soil, air and water?	-

- 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 & ship yards and marinas.
 Note 3 From older transformer oils & 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 VOCs).

5.4 Contaminants of Potential Concern

Based on the findings of the site contamination appraisal the contaminants of potential concern (COPC) at the site are considered to be:

- Soil – heavy metals (HMs), total recoverable hydrocarbons (TRH), polycyclic aromatic hydrocarbons (PAH), the monocyclic aromatic hydrocarbon (MAH) compounds benzene, toluene, ethylbenzene and xylenes (BTEX), organochlorine and organophosphate pesticides (OCP/ OPP), polychlorinated biphenyls (PCB), and asbestos.

- Groundwater – HMs, TRH, BTEX, PAH and volatile organic compounds (VOC).

5.5 Potential Sources, Exposure Pathways and Receptors

Potential contamination sources, exposure pathways and human and environmental receptors that were considered relevant for this assessment are summarised along with a qualitative assessment of the potential risks posed by complete exposure pathways in **Table 5-4**.

Table 5-4 Conceptual Site Model

Site Area	Subsurface Profile	Potential Sources	Potential Contaminants	Media	Sensitive Receptor	Migration & Exposure Pathways
Site footprint	Potentially impacted fill overlying colluvial soil.	<ul style="list-style-type: none"> ▪ Imported filling ▪ Impacts from previous industrial activities ▪ Potential residues from pesticide use ▪ Weathering of building structures ▪ Leakage from parked vehicles 	<ul style="list-style-type: none"> ▪ Heavy metals ▪ TRH ▪ BTEX ▪ PAH ▪ Pesticides ▪ PCB ▪ PFAS ▪ VOC ▪ Asbestos 	Soil	<ul style="list-style-type: none"> ▪ Future residents ▪ Construction and Maintenance workers ▪ Deep soil planting areas 	<ul style="list-style-type: none"> ▪ Dermal Contact ▪ Ingestion ▪ Inhalation
				Groundwater		
Site	Soil beneath the current buildings	Building demolition rubble from the former buildings	<ul style="list-style-type: none"> ▪ Lead ▪ Asbestos 	Near surface soils	<ul style="list-style-type: none"> ▪ Future residents ▪ Construction workers 	<ul style="list-style-type: none"> ▪ Dermal Contact ▪ Ingestion ▪ Inhalation

5.6 Data Gaps

Based on information from the site walkover inspection and site history review, EI considered a programme of intrusive investigation was warranted to conduct targeted sampling at locations of known, potential sources of contamination (as listed in **Section 5.1**), with systematic sampling coverage in site areas where operational site history was not documented.

6. Methodology

6.1 Sampling, analytical and quality plan (SAQP)

The SAQP ensures that the data collected during environmental works at the site are representative, and provide a robust basis for site assessment decisions. The SAQP includes the following:

- Data quality objectives, including a summary of the objectives of the ESA;
- Investigation methodology including media to be sampled, details of analytes and parameters to be monitored and a description of intended sampling points;
- Sampling methods and procedures;
- Field screening methods;
- Analysis Methods;
- Sample handling, preservation and storage; and
- Analytical QA/QC.

6.2 Data Quality Objectives (DQO)

In accordance with the US EPA (2006) *Data Quality Assessment* and the EPA (2017) *Guidelines for the NSW Site Auditor Scheme*, the process of developing Data Quality Objectives (DQO) was used by the EI assessment team to determine the appropriate level of data quality needed for the specific data requirements of the project. The DQO process that was applied for this assessment is documented in Error! Reference source not found.

Table 6-1 Summary of Project Data Quality Objectives

DQO Steps	Details
<p>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</p>	<p>Site history (Section 3 and 4) identified a range of contamination sources with potential to have impacted the site. Current site land use is commercial. Proposed development is unknown, however this has been assumed to be high density residential, that is, equivalent to a generic NEPC (2013) land use setting of residential with minimal opportunities for soil access..</p> <p>Intrusive investigation is required to determine:</p> <ul style="list-style-type: none"> ▪ Is the site suitable for the proposed residential development with minimal access to soil? and ▪ Does the site pose an unacceptable risk to human and/or ecological receptors?
<p>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</p>	<p>Based on the objectives (Section 1.4), decisions that need to be made are</p> <ul style="list-style-type: none"> ▪ Has enough data been collected to determine the risk of contamination at the site, including potential offsite migration of contamination? and ▪ Is the data adequate to determine suitability of the site for residential use?
<p>3. Identify Information Inputs (Identify inputs to decision) Identify the information needed to support any decision and specify which inputs require new environmental measurements</p>	<p>Inputs to the decision-making process include:</p> <ul style="list-style-type: none"> ▪ The proposed future land use; ▪ Available site historical information; ▪ Previous investigations; ▪ Areas of concern, identified during the site inspection prior to intrusive investigations; ▪ National and NSW EPA guidelines endorsed under the <i>Contaminated Land Management Act 1997</i>; ▪ Investigation sampling (soils and groundwater) and laboratory analysis for COPCs to verify the presence of onsite contamination and to evaluate the potential risks to sensitive receptors; and ▪ Further input to the decision will be sample collection and handling, field and laboratory QAQC and confirmation that data quality indicators (DQIs) were achieved.
<p>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</p>	<p>Spatial – The DSI is limited to the site boundaries (Figure 2) and the maximum depth of borehole advancement at each sample location.</p> <p>Temporal – The results will be valid on the day samples are collected and will remain valid if no changes to site use occur, and contamination (if present) does not migrate from off-site sources.</p> <p>Constraints of sampling requiring consideration include access restrictions (due to site operations and/or conditions) and presence of both above and underground services / structures.</p>

DQO Steps	Details
<p>5. Develop the Analytic Approach (Develop a decision rule)</p> <p>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</p>	<p>The decision rules for the investigation are:</p> <ul style="list-style-type: none">• What are the characteristics of soil at the site? <i>Soil boreholes will be advanced to natural, sampled and logged to characterise underlying conditions.</i>• What are the characteristics of groundwater at the site? <i>Groundwater monitoring well will be installed to determine physical characteristics, chemical composition of groundwater underlying the site.</i>• Is the site suitable for the proposed land use? <i>If the concentrations of contaminants in the soil and groundwater data are below the relevant health-based and ecological criteria for the intended land use; then the site will be deemed suitable for the proposed development.</i>• Is additional information required to determine the suitability of the site for its proposed use? <i>Should additional information be required as determined by the conceptual site model (CSM), then appropriate recommendations will be provided.</i> <p>▪ Decision criteria for analytical data are defined by the Data Quality Indicators (DQI) in Table 6-2.</p>
<p>6. Specify Performance or Acceptance Criteria (Specify limits on decision errors)</p> <p>Specify the decision-maker's acceptable limits on decision errors, which are used to establish performance goals for limiting uncertainties in the data</p>	<p>Specific limits for this project are to be in accordance with NEPM, appropriate data quality indicators (DQIs) for assessing the useability of the data and EI standard procedures for field sampling and handling.</p> <p>To assess the useability of the data, pre-determined DQIs for completeness, comparability, representativeness, precision and accuracy were adopted, as presented below in Table 6-2.</p> <p>If any of the DQIs are not met, further assessment will be necessary to determine whether the non-conformance will significantly affect the useability of the data. Corrective actions may include requesting further information from samplers and/or analytical laboratories, downgrading of the quality of the data or alternatively, re-collection of samples.</p>
<p>7. Develop the Detailed Plan for Obtaining Data (Optimise the design for obtaining data)</p> <p>Identify the most resource-effective sampling and analysis design for general data that are expected to satisfy the DQOs</p>	<p>Site history indicates the potential for contamination to exist. To satisfy the decision rules, the intrusive investigation included:</p> <ul style="list-style-type: none">▪ Sampling of locations in a systematic pattern across accessible parts of the site, targeting potential source areas identified from site history, site walkover and observations at the site made by EI.▪ Installation and sampling of groundwater well, to determine groundwater quality.▪ An upper soil profile sample will be collected at each borehole location and tested for contaminants of potential concern, to assess the conditions of the fill layer, and impacts from commercial activities at ground level. Further sampling would also be carried out at deeper soil layers. Samples will be selected based on field observations (including visual and olfactory evidence, as well as soil vapour screening in headspace samples) with consideration of subsurface stratigraphy.▪ Representative groundwater sample will be collected and analysed for groundwater characterisation.▪ Review of the results will be undertaken to determine if further intrusive investigation (i.e. additional sampling) is warranted.

6.3 Data Quality Indicators

To ensure that the investigation data collected was of an acceptable quality, the investigation data set was assessed against the data quality indicators (DQI) outlined in **Table 6-2**, which related to both field and laboratory-based procedures. The assessment of data quality is discussed in **Section 7**.

Table 6-2 Data Quality Indicators

QA/QC Component	Data Quality Indicator(s)
<p>Precision A quantitative measure of the variability (or reproducibility) of data</p>	<p>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:</p> <ul style="list-style-type: none"> ▪ 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.
<p>Accuracy A quantitative measure of the closeness of reported data to the “true” value</p>	<p>Data accuracy was assessed through the analysis of:</p> <ul style="list-style-type: none"> ▪ 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.
<p>Representativeness The confidence (expressed qualitatively) that data are representative of each medium present onsite</p>	<p>To ensure the data produced by the laboratory were representative of conditions encountered in the field, the following measures were taken:</p> <ul style="list-style-type: none"> ▪ 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).
<p>Completeness A measure of the amount of useable data from a data collection activity</p>	<p>Analytical data sets acquired during the DSI were evaluated as complete upon confirmation that:</p> <ul style="list-style-type: none"> ▪ 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. <p>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.</p>
<p>Comparability The confidence (expressed qualitatively) that data may be considered to be equivalent for each sampling and analytical event</p>	<p>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.</p> <p>In addition the data were collected by experienced samplers and NATA-accredited laboratory methodologies will be employed.</p>

6.4 Sampling Rationale

With reference to the CSM described in **Section 5**, soil and groundwater investigation works were planned in accordance with the following rationale:

- Sampling fill and natural soils from six test bore locations located at accessible area of the site to characterise in-situ soils;
- Sampling groundwater during a single groundwater monitoring event (GME) at one monitoring well to assess for potential groundwater impacts; and
- Laboratory analysis of representative soil and groundwater samples for the identified COPC.

6.5 Assessment Criteria

The assessment criteria proposed for this project are outlined in **Table 6-3**. These were selected from available published guidelines that are endorsed by national or state regulatory authorities, with due consideration of the exposure scenario that is expected for various parts of the site, the likely exposure pathways and the identified potential receptors.

Table 6-3 Adopted Investigation Levels for Soil and Groundwater

Environmental Media	Adopted Guidelines	Rationale
Soil	NEPM, 2013 Soil HILs, EILs, HSLs, ESLs & Management Limits for TPHs	<p><u>Soil within the proposed basement footprint:</u></p> <p>Soil Health-based Investigation Levels (HIL) Samples to be assessed against the NEPM 2013 HIL-B thresholds for residential sites with minimal access to soils.</p> <p>Soil Health-based Screening Levels (HSL) NEPM (2013) HSL-D for commercial and Industrial exposure settings is it is understood the proposed development will include a single level basement.</p> <p>Asbestos HSLs: WADOH (2009) assessment criteria, as presented in NEPM (2013), were not adopted during this investigation. Presence / absence of asbestos (not-detected) were utilised for preliminary screening purposes.</p> <p>Ecological Investigation Levels (EILs) / Ecological Screening Levels (ESLs) EILs / ESLs were considered relevant for the retained deep soils of the site. EILs / ESLs only apply to the top 2 m (root zone). The derived EIL criteria presented by EI are based on the addition of site specific Added Contaminant Limit (ACL) criteria and the Ambient Background Concentration (ABC) for an old high traffic suburb. The adopted ESL criteria presented by EI are based on conservative coarse grained criteria.</p> <p>Management Limits for Petroleum Hydrocarbons Should the ESLs and HSLs be exceeded for petroleum hydrocarbons, soil samples will also be assessed against the NEPM 2013 <i>Management Limits</i> for the TRH fractions F1 – F4 to assess propensity for phase-separated hydrocarbons (PSH), fire and explosive hazards & adverse effects on buried infrastructure.</p>
	CRC Care (2017)	High reliability ecological criteria for Benzo(α)pyrene

Environmental Media	Adopted Guidelines	Rationale
	High reliability ecological criteria for Benzo(α)pyrene	The CRC Care criteria has been selected for ecological assessment of Benzo(α)pyrene due to its higher reliability than the NEPM assessment level.
Groundwater	NEPM, 2013 GILs for Marine Waters	<p>Groundwater Investigation Levels (GILs) for Marine Water</p> <p>NEPM 2013 provides GILs for typical, slightly-moderately disturbed aquatic ecosystems, which are based on the ANZG 2018 Trigger Values (TVs) for the 95% level of protection of aquatic ecosystems; however, the 99% TVs were applied for the bio-accumulative metals <i>cadmium</i> and <i>mercury</i>. The marine criteria were considered relevant as groundwater is expected to discharge to Parramatta River, located approximately 15 m north of the site.</p> <p>Due to the ANZG, 2018 criteria for petroleum hydrocarbons being below the laboratory limit of reporting, the PQL for each TRH fraction was adopted as the GIL for aquatic ecosystems, as per the guidance provided in DEC (2007) Guidelines for the Assessment and Management of Groundwater Contamination.</p>
	NEPM, 2013 Groundwater HSLs for Vapour Intrusion	<p>Health-based Screening Levels (HSLs)</p> <p>As the proposed development will include a single level basement, HSL D was adopted.</p>
	NEPM, 2013 GILs for Drinking purposes	<p>Drinking Water GILs</p> <p>The NEPM (2013) GILs for drinking water quality were applied for exposure scenarios where receptors may be directly exposed to groundwater, either by direct contact or accidental ingestion. These were based on the Australian Drinking Water Guidelines (NHMRC, 2016).</p>

For the purposes of this investigation, the adopted soil assessment criteria are referred to as the Soil Investigation Levels (SILs) and the adopted groundwater assessment criteria are referred to as the Groundwater Investigation Levels (GILs). SILs and GILs are presented alongside the analytical results in the corresponding summary tables, which are discussed in **Section 8.3**.

6.6 Soil Investigation

The soil investigation works conducted at the site are described in **Table 6-4**. Test bore locations are illustrated in **Figure 2**.

Table 6-4 Summary of Soil Investigation Methodology

Activity/Item	Details
Fieldwork	The site investigation was conducted on 11 and 18 June 2021. All hand auger boreholes were refusal in fill materials due to solid objective encountered.
Drilling Method & Investigation Depth	Test bores BH101M and BH102 were drilled using a CE180 tight access solid flight auger drill rig. EBH1 to EBH4 were drilled by a hand auger. Final bore depths ranged from 0.3 m to 9.87 mBGL. BH101M was converted to a groundwater monitoring well.

Activity/Item	Details
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 classifications and descriptions were based on Unified Soil Classification System (USCS) and Australian Standard (AS) 4482.1-2005. Bore logs are presented in Appendix G .
Field Observations (including visual and olfactory signs of potential contamination)	A summary of field observations compiled during intrusive investigations is provided on borehole logs in Appendix G . Field observations are summarised in Section 8.1.2 .
Soil Sampling	<ul style="list-style-type: none"> ▪ Soil samples were collected using a dry grab method (unused, dedicated nitrile gloves) & placed into laboratory-supplied, acid-washed, solvent-rinsed glass jars. ▪ Blind field duplicates were separated from the primary samples and placed into glass jars. ▪ A small amount of duplicate was collected from each soil samples and placed into zip-lock bag for Photo-ionisation Detector (PID) screening of volatile organic compounds (VOCs). ▪ A small amount of duplicate was separated from all fill samples and placed into a zip-lock bag for asbestos analysis.
Decontamination Procedures	Dedicated gloves were used for the collection of each sample. Sampling equipment (i.e. trowel and shovel) was decontaminated between uses by washing in a solution of potable water and Decon 90 then rinsed with potable water.
Sample Preservation	Samples were stored in a refrigerated (ice-filled) chest, whilst on-site and in transit to the laboratory. All samples were submitted and analysed within the required holding period, as documented in laboratory reports discussed in a later section.
Management of Soil Cuttings	Soil cuttings were used as backfill for completed boreholes.
Quality Control & Laboratory Analysis	Selected soil samples were submitted for analysis of previously-identified COPC by SGS Laboratories (SGS). QA/QC testing comprised intra-laboratory duplicates ('field duplicates') tested blind by SGS and an inter-laboratory field duplicate tested blind by Envirolab Services (Envirolab). All samples were transported under strict Chain-of-Custody (COC) conditions and COC certificates and laboratory sample receipt documentation were provided to EI for confirmation purposes, as discussed in Section 7 .
Soil Vapour Screening	Screening for potential VOCs in collected soil samples was conducted using a Photo-ionisation Detector (PID) fitted with a 10.9 eV lamp.

6.7 Groundwater Investigation

The groundwater investigation works conducted at the site are described in **Table 6-5**. Monitoring well locations are illustrated in **Figure 2**.

Table 6-5 Summary of Groundwater Investigation Methodology

Activity/Item	Details
Fieldwork	Groundwater monitoring well BH101M was installed and developed on 11 June 2021, with water level gauging, well purging, field testing, and groundwater sampling conducted on 18 June 2021.

Activity/Item	Details
Well Construction	<p>One test bore was converted to groundwater monitoring well as follows: BH101M: 7.0 m deep, at car park area; Drilled by BG Drilling using a tight access, solid-flight auger rig. Well construction details are tabulated in Table 8-2 and documented in the bore logs presented in Appendix G. The well was seated in sandstone and installed to screen across sandstone within the interval below:</p> <ul style="list-style-type: none"> ▪ BH101M: 4.0 m to 7.0 mBGL.
Well Construction Standards	<p>Well construction was in general accordance with the standards described in NUDLC, 2012 and involved the following:</p> <ul style="list-style-type: none"> ▪ 50 mm, Class 18 uPVC, threaded, machine-slotted screen and casing, with slotted intervals in shallow wells set to screen to at least 500 mm above the standing water level to allow sampling of phase-separated hydrocarbon product, if present; ▪ Base and top of each well was sealed with a uPVC cap; ▪ Annular, graded sand filter was used to approximately 300 mm above top of screen interval; ▪ Granular bentonite was applied above annular filter to seal the screened interval; ▪ Drill cuttings were used to backfill the bore annulus to just below ground level; and ▪ Surface completion comprised a steel road box cover set in neat cement and finished flush with the concrete slab level.
Well Development	<p>Well development was conducted directly following installation. This involved agitation within the full length of the water column using a dedicated, HDPE, disposable bailer, followed by removal of water and accumulated sediment using a 12V, HDPE submersible bore pump (Proactive Environmental, model Super Twister). Pumping was continued until no further reduction in suspended sediment was observed (i.e. after removal of several well volumes).</p>
Well Gauging & Groundwater Flow Direction	<p>Monitoring well BH101M was gauged for standing water level (SWL, depth to groundwater) prior to well purging at the commencement of the GME on 18 June 2021 and measured SWL is shown in Table 8-2.</p>
Well Purging & Field Testing	<p>GME conducted on 18 June 2021. Measured water quality data is shown in Table 8-3.</p> <p>A transparent HDPE bailer was used to visually assess for the presence PSH prior to the commencement of well purging. PSH was not detected in wells during the investigation.</p>
Groundwater sampling	<p>Once three consecutive field measurements were recorded for the purged waters to within $\pm 10\%$ for DO, $\pm 3\%$ for EC and ± 0.05 for pH, this was considered to indicate that representative groundwater quality had been achieved and final physico-chemical measurements were recorded. Groundwater samples were then collected using a transparent, dedicated, HDPE bailer. No volatile organic odours were detected during well purging or groundwater sampling.</p>

Activity/Item	Details
Decontamination Procedure	<ul style="list-style-type: none">▪ Decontamination was not required as sampling equipment was stored and transported prior to use in factory-sealed, plastic sleeves, while each bailer was dedicated to each individual well.▪ All sample containers were supplied by the laboratory for the particular project and only opened once immediately prior to sampling.▪ While ice was used to keep the samples cool, all melt water was continuously drained from the Esky to prevent cross-contamination of samples.▪ The water level probe and water quality kit probes were washed in a solution of potable water and Decon 90 and then rinsed with potable water between measurements/wells.
Sample Preservation	Samples were stored in a chilled (with ice-bricks) chest, whilst on-site and in transit to the laboratory. All samples were submitted and analysed within the required holding period, as documented in laboratory reports discussed in a later section.
Quality Control & Laboratory Analysis	All groundwater samples were submitted for analysis of previously-identified COPC by SGS Laboratories (SGS). QA/QC testing comprised intra-laboratory duplicates ('field duplicates') tested blind by SGS and an inter-laboratory field duplicate tested blind by Envirolab Services (Envirolab). All samples were transported under strict Chain-of-Custody (COC) conditions and COC certificates and laboratory sample receipt documentation were provided to EI for confirmation purposes.
Sample Transport	After sampling, refrigerated sample chests were transported to SGS Australia Pty Ltd using strict Chain-of-Custody (COC) procedures. Inter-laboratory duplicate (ILD) samples were forwarded to Envirolab Services Pty Ltd (Envirolab) for QA/QC analysis. A Sample Receipt Advice (SRA) was provided by each laboratory to document sample condition upon receipt. Copies of SRA and COC certificates are presented in Appendix I .

7. Data Quality Assessment

The assessment of data quality is defined as the scientific and statistical evaluation of environmental data to determine if the data meets the objectives for the project (US EPA, 2006). Data quality assessment included an evaluation of the compliance of the field sampling, field and laboratory duplicates and laboratory analytical procedures and an assessment of the accuracy and precision of these data from the laboratory quality control measurements. The findings of the data quality assessment in relation to the current investigation at the site are discussed in detail in **Appendix K**.

The QC measures generated from the field sampling and laboratory analytical program are summarised in **Table 7-1**:

Table 7-1 Quality Control Process

Data Quality	Control	Conformance [Yes, Part, No]	Report Sections
Preliminaries	Data Quality Objectives established	Yes	See DQO/DQI (Section 6.2)
Field work	Suitable documentation of fieldwork observations including borehole logs, sample register, field notes, calibration forms	Yes	See Appendices (Appendix H)
Sampling Plan	Use of relevant and appropriate sampling plan (density, type, and location)	Yes	See sample rationale (Section 6.5)
	All media sampled and duplicates collected	Yes	Soil vapour not required
	Use of approved and appropriate sampling methods (soil, groundwater, air quality)	Yes	See methodology (Section 6.6 and 6.7)
	Selection of soil samples according to field PID readings (where VOCs are present)	Yes	See methodology (Section 6.6)
	Preservation and storage of samples upon collection and during transport to the laboratory	Yes	See methodology (Section 6.6 and 6.7)
	Appropriate Rinsate, Field and Trip Blanks taken	Part	No field blanks collected (Appendix K)
	Completed field and analytical laboratory sample COC procedures and documentation	Yes	See laboratory reports (Appendix I and J)
Laboratory	Sample holding times within acceptable limits	Yes	See laboratory QA (Appendix K)
	Use of appropriate analytical procedures and NATA-accredited laboratories	Yes	See laboratory report (Appendix K)
	LOR/PQL low enough to meet adopted criteria	Yes	See laboratory appendix J
	Laboratory blanks	Yes	See laboratory QA/QC (Appendix K)

Data Quality	Control	Conformance [Yes, Part, No]	Report Sections
	Laboratory duplicates	Yes	See laboratory QA/QC (Appendix K)
	Matrix spike (MS)	Yes	See laboratory QA/QC (Appendix K)
	Surrogates (or System Monitoring Compounds)	Yes	See laboratory QA/QC (Appendix K)
	Analytical results for replicated samples, including field and laboratory duplicates and inter-laboratory duplicates, expressed as Relative Percentage Difference (RPD)	Yes	See QA Tables Appendix K
	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 K.
Reporting	Report reviewed by senior staff to assess project meets desired quality, EPA guidelines and project outcomes.	Yes	See document control

7.1 Quality Overview

On the basis of the field and analytical data validation procedure employed, the overall quality of the analytical data produced for the site was considered to be of an acceptable standard for interpretive use and preparation of a conceptual site model (CSM).

8. Results

8.1 Soil Investigation Results

8.1.1 Site Geology and Subsurface Conditions

The general site geology encountered during the drilling of the soil investigation was a layer of silty sand and sandy clay filling overlying natural silty sand and silty clay then sandstone bedrock. The geological information obtained during the investigation is summarised in **Table 8-1** and borehole logs from these works are presented in **Appendix G**.

Table 8-1 Generalised Subsurface Profile

Layer	Description	Average Depth to top & bottom of layer (mBGL)
Hardstand	Concrete	0.0 – 0.13 (BH102)
Fill/Topsoil	Silty sand, fine to medium grained, pale brown; Sandy clay, low plasticity, brown; and Topsoil; Silty sand, medium to coarse grained, dark grey.	0.0 – 0.41 +
Natural Soil	Silty Sand, fine grained, brown; and Silty Clay, high plasticity, pale grey.	0.3- 3.11 3.0 – 9.87 +
Bedrock	Sandstone, fine grained, brown and pale grey	3.23 – 8.8 +

+ Termination depth of borehole

8.1.2 Field Observations and PID Results

Soil samples were obtained from the test bores at various depths ranging between 0.1 m to 6.2 mBGL. 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, and charcoal) and the following observations were noted:

- Fragments of metal and fibre cement sheeting were observed in fill at EBH103, Tile fragments were observed in shallow fill at EBH104. Fragments of brick and sandstone were observed in fill at each of EBH101, EBH102, EBH103 and EBH104.
- Fibrous cement sheet fragments observed on the ground surface near EBH103 and identified as asbestos containing material (ACM);
- Visual or olfactory evidence of hydrocarbon impacts were not noted at any of the borehole locations investigated during this assessment;
-
- Ssh, charcoal or slag was not observed in examined fill soils. , and
- VOC concentrations ranging from 0.1 to 0.5 parts per million (ppm) were detected in soil. The PID results are shown in the borehole logs (**Appendix G**).

8.2 Groundwater Investigation Results

8.2.1 Monitoring Well Construction

One groundwater monitoring well was installed onsite. Well construction details for the installed groundwater monitoring well are summarised in **Table 8-2**.

Table 8-2 Monitoring Well Construction Details

Well ID	Bore Depth (mBGL)	Approx. RL (GL)	Approx. RL (TOC)	Screen Interval (mBGL)	Lithology Screened
BH101M	7.0	2.31*	2.31	4.0-7.0	Sandstone

Notes:

mBGL - metres below ground level.

RL - Reduced Level – Surveyed elevation in metres relative to Australian Height Datum (m AHD).

TOC - top of well casing).

RL (TOC) - Surveyed elevation at TOC in mAHD.

8.2.2 Field Observations and Water Test Results

A single GME was conducted on 18 June 2021. On this date, standing water levels (SWLs) were measured within each well prior to well purging, the results of which were recorded with well purge volumes and field-based water test results. A summary of the recorded field data is presented in

Table 8-3 and copies of the completed Field Data Sheets are included in **Appendix H**.

Table 8-3 Groundwater Field Data

Well ID	SWL (mBTOC)	RL (TOC)	Purge Volume (L)	DO (mg/L)	Field pH	Field EC (µS/cm)	Temp(°C)	Redox (mV)	Odours / Turbidity
BH101M	1.0	2.31	1.5	1.58	7.21	206	19.1	226	None/ low

Notes:

SWL – Standing Water Level as measured from TOC (top of well casing) prior to groundwater sampling.

mBTOC – metres below top of well casing.

RL (TOC) – Reduced Level, elevation at TOC in metres relative to Australian Height Datum (mAHD).

Redox – Oxidation and reduction potential. Redox reported in **Table 9-2** has been adjusted relative to standard hydrogen electrode (SHE) by adding 205 mV (field probe potential) to field reading, as advised by the test equipment manufacturer). Refer to **Appendix H** for field redox readings pre-adjustment.

L – litres (referring to volume of water purged from the well prior to groundwater sample collection).

EC – groundwater electrical conductivity as measured onsite using portable EC meter.

µS/cm – micro Siemens per centimetre (EC units).

DO – Dissolved Oxygen in units of milligrams per litre (mg/L).

All groundwater parameters (pH, EC and DO) were tested on site.

8.3 Laboratory Analytical Results

8.3.1 Soil Analytical Results

A summary of laboratory results showing test sample quantities, minimum/maximum analyte concentrations and samples found to exceed the SILs, is presented in **Table 8-4**. More detailed tabulations of results showing the tested concentrations for individual samples alongside the adopted soil criteria are presented in **Table T1** at the end of this report. Completed documentation used to track soil sample movements and laboratory receipt (i.e. COC and SRA forms) are copied in **Appendix I** and all laboratory analytical reports for tested soil samples are presented in **Appendix J**.

Table 8-4 Summary of Soil Analytical Results

No. of primary samples	Analyte	Min. Conc. (mg/kg)	Max. Conc. (mg/kg)	Sample locations exceeding investigation levels
Hydrocarbons				
8	Benzene	<0.1	<0.1	None
8	Toluene	<0.1	<0.1	None
8	Ethyl benzene	<1.0	<1.0	None
8	Total xylenes	<0.3	<0.3	None
8	Naphthalene	<0.1	<0.1	None
8	Total PAH	<0.8	<0.8	None
8	Carcinogenic PAHs	<0.3	<0.3	None
8	Benzo(a)pyrene	<0.1	<0.1	None
8	F1	<25	<25	None
8	F2	<25	<25	None
8	F3	<90	<90	None
8	F4	<120	<120	None
OCPs				
6	Total OCPs	<PQL	<PQL	None
OPPs				
6	Total OPPs	<PQL	<PQL	None
Heavy Metal				
8	Arsenic	2	4	None
8	Cadmium	<0.3	<0.3	None
8	Chromium (Total)	4.3	15	None
8	Copper	1	31	None
8	Lead	3	40	None
8	Mercury	<0.05	0.15	None
8	Nickel	0.6	3	None
8	Zinc	10	530	EBH103_0.1-0.2 (530mg/kg), (adopted EIL: 190 mg/kg).
PCBs				
6	Total PCBs	<1	<1	None
Asbestos				
6	Asbestos	No asbestos detected	Yes	Asbestos detected (presence/absence screening protocol) in EBH103_0.1-0.2 and EBH104_0.1-0.2.

Priority Metals,

With reference to **Table T1**, all priority metals concentrations were below the corresponding health-based SILs and EILs (**Section 7-3**) with exception of the following:

- Zinc in fill sample EBH103_0.1-0.2 (530 mg/kg), exceeded adopted ecological criterion (EIL: 190 mg/kg);

PAHs

As summarised in **Table T1**, all of fill and natural soil samples tested were below the adopted health based SILs and EIL for PAHs.

TRHs including BTEX

With reference to **Table T1**, BTEX concentrations were reported below the laboratory PQL and subsequently below the adopted human health based criteria and ESLs.

OCPs, OPPs and PCBs

As illustrated in **Table T1**, the total concentrations of OCPs, OPPs and Total PCBs were reported below the laboratory PQL and the adopted human health SIL and EIL.

Asbestos

As summarised in **Table T1**, no detectable asbestos concentrations were identified in any of the tested soil samples; with the exception of the following:

- Asbestos was detected in soil (presence/absence protocol) in EBH103_0.1-0.2 and EBH104_0.1-0.2.

8.3.2 Groundwater Analytical Results

Laboratory analytical results for groundwater samples are summarised in **Table T2**, which also include the adopted GILs. Completed documentation used to track groundwater sample movements and laboratory receipt (COC and SRA forms) are copied in **Appendix K**. Copies of the laboratory analytical reports are attached in **Appendix J**.

Table 8-5 Summary of Groundwater Analytical Results

No. of primary samples	Analyte	Concentration (µg/L)	Sample locations exceeding investigation levels
Metals			
1	As	<1	None
1	Cd	0.2	None
1	Cr	5	BH101M (5µg/L), (GIL Marine Water: 4.4 µg/L)
1	Cu	15	BH101M (15µg/L), (GIL Marine Water: 1.3 µg/L)
1	Pb	2	None
1	Hg	<0.1	None
1	Ni	470	BH101M (470µg/L), (GIL Marine Water: 7 µg/L)
1	Zn	130	BH101M (130µg/L),

No. of primary samples	Analyte	Concentration (µg/L)	Sample locations exceeding investigation levels
(GIL Marine Water: 15 µg/L)			
PAHs			
1	Total PAHs	<1	None
1	Benzo(α)pyrene	<0.1	None
1	Naphthalene	<0.1	None
BTEX			
1	Benzene	<0.5	None
1	Toluene	<0.5	None
1	Ethylbenzene	<0.5	None
1	o-xylene	<0.5	None
1	m/p-xylene	<1	None
TRHs			
1	F1	<50	None
1	F2	180	None
1	F3	<500	None
1	F4	<500	None
VOCs			
1	Chloroform (THM)	2.5	None
1	1,2,4-trimethylbenzene	15	None
1	1,3,5-trimethylbenzene	6.7	None
1	Other VOCs	Not detected	None
1	Total VOCs	30	None

Priority Metals

With reference to **Table T2**, concentrations in excess of GIL for Marine Water were identified for groundwater sampled from monitoring well BH101M for Chromium (5.0 µg/L), Copper (15 µg/L), Nickel (470 µg/L) and Zinc (130 µg/L).

PAHs

As summarised in **Table T2**, concentrations of PAHs were reported below the adopted GILs.

TRHs and BTEX

As shown in **Table T2**, tested TRHs and BTEX concentrations were below the corresponding GILs.

VOCs

As shown in **Table T2**, majority of the laboratory results for VOCs were reported below the laboratory PQL. It is noted that low concentrations of Chloroform (THM) (2.5 µg/L), and hydrocarbons (1,2,4-trimethylbenzene (15 µg/L), and 1,3,5-trimethylbenzene (6.7 µg/L)), were reported in the groundwater sample.

9. Site Characterisation

9.1 Soil

Contaminant concentrations in soils were found to be below the adopted human health-based criteria and ecological criteria for site land use settings, with the exception of the following:

- Asbestos was reported in shallow fill at location EBH103_0.1-0.2. Fragments of ACM were also observed on the ground surface at this location.
- Zinc was reported in shallow fill at location EBH103_0.1-0.2 (530 mg/kg), exceeded the adopted ecological criterion (EIL, 190 mg/kg);

It is noted that borehole EBH103 was located next to the residence on site, and it is likely that reported asbestos and zinc in shallow fill are due to historical weathering fall out of building materials (e.g. asbestos from cladding, zinc from metal roofing material).

9.2 Groundwater Concentration

Based on the findings from the groundwater monitoring and sampling event, concentrations of tested COPCs (PAHs, BTEX, and TRH) at monitoring well BH101M were all reported below the adopted criteria (GILs). Other analytes were also reported:

- A low concentration of chloroform (2.5 ug/L) was reported. The drinking water criteria for THMs (250 ug/L) was not exceeded.
- Petroleum hydrocarbons (1,2,4-trimethylbenzene (15 ug/L) and 1,3,5-trimethylbenzene (6.7 ug/L)) were reported. The concentrations were low and the risk to human health and ecological receptors was low.

Priority metals were reported at concentrations below adopted investigation criteria at BH101M, with the exception of chromium, copper, nickel and zinc.

- The concentrations of chromium and copper are low. The concentration of zinc is elevated however zinc is ubiquitous in urban environments due to run off from zinc coated roofs, fences and other building materials. The concentrations of these metals are typical of background quality in urban settings
- The concentration of nickel in groundwater is elevated. The concentration of nickel in soil at the site is low, it is unlikely that site soil is contributing to the reported concentration of nickel in groundwater. Palm Beach has a reticulated water supply system, so there is unlikely to be beneficial use of groundwater for domestic use or other purpose. The health risk from nickel in groundwater is low.

9.3 Preliminary Waste Classification

Preliminary waste classification was conducted during this investigation. 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. A table with 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 9-1**. It should be noted that further sampling following demolition will be required to confirm these classifications.

Table 9-1 Preliminary Waste Classification Summary

Material	Estimated Volume (m ³)	Estimated Tonnage (t)	Preliminary Waste Classification	Likely Disposal Options
General site fill	548	877	General Solid Waste (GSW)	Recycling Facility
Fill in the vicinity of EBH103 and EBH104	40	64	General Solid Waste (GSW) / Asbestos Waste	Landfill
Non-impacted natural materials (sand, sandstone/Shale)	3612	5779	Virgin Excavated Natural Material (VENM)	VENM Tip

Note 1 A bulk density of 1.6 t/m³ was adopted.

Note 2 Fill volume was generally calculated by area of the classification and average depth of fill.

Note 3 The area (approximate 100m²) of asbestos impacted fill was calculated based on the borehole location of EBH103 and EBH104.

The proposed development involved the construction of a single-level basement facility, natural soil volume was generally calculated by area of the site and expected excavation depth (approximately 3m BGL), then minus estimated fill volume.

9.4 Review of Conceptual Site Model

On the basis of investigation findings the CSM discussed in **Section 5** was considered to appropriately identify contamination sources, migration mechanisms and exposure pathways, as well as potential onsite and offsite receptors. Previously known data gaps, as outlined in **Section 5.4** have largely been addressed; however, the following remaining data gaps need to be addressed in subsequent investigation works:

- Assessment of existing site structures for the presence of hazardous building materials;
- The lateral and vertical extent of asbestos impacted soil reported at location EBH103; and

10. Acid Sulfate Soil Assessment

In accordance with the ASSMAC (1998) Acid Sulfate Soil Manual, a total of 2 locations (BH101M and BH102) were investigated for acid sulfate soil (ASS) parameters across the site as shown in **Figure A2**, and sampling extended to a depth of 6.2m BGL. Representative soil samples from borehole locations were assigned to be analysed for the parameters recommended in Section 2 of ASSMAC (1998), to confirm the presence/absence of ASSs:

- pH_f and pH_{fox}; and
- Suspension Peroxide Oxidation Combined Acidity and Sulfate (sPOCAS).

All laboratory analyses were conducted on discrete samples using NATA-registered methods. Laboratory results are summarised in **Table 10-1**, with laboratory analytical certificates provided in **Appendix J**.

Examination of soil during borehole drilling did not report odorous soil or visual indicators of PASS

LABORATORY ANALYTICAL RESULTS

pH (field) and pH (peroxide oxidised) Testing

The pH measurements were both conducted on 1:5 soil/water extracts. For all tested samples pH readings ranged between 4.5 and 8.5 pH units, indicating soils were slightly acidic in terms of acidity and was not actual ASS (AASS).

The peroxide testing, which involved oxidation of the soils with 30% hydrogen peroxide, showed pH readings ranging between 3.8 to 7.3 pH units and therefore indicating site soils were not found to be potential ASS (PASS).

In addition no samples exhibited a strong reaction when mixed with the peroxide solution indicating the absence of AASS or PASS.

Non-Oxidised and Oxidised pH Testing

Measured pH KCl values (non-oxidised pH testing) in samples indicated generally neutral conditions, in terms of acidity, in tested soils. Measured pH Ox values (oxidised pH testing) suggested the tested soil samples were not prone to major pH value changes after peroxide oxidation.

sPOCAS

Suspended peroxide oxidation combined acidity and sulfate testing was conducted on 5 samples, with the peroxide oxidisable sulphur (SPOS) in three samples were found to be above 0.03% w/w. Acid trail was detected, with total potential acidity in four samples found to be above 18 mol H⁺/tonne, however Measured total sulfidic acidity in all samples were found to be below 18 mol H⁺/tonne

To determine the presence of PASS chromium suite analysis was undertaken on 3 selected samples.

Chromium Suite Analysis

Chromium Suite Analysis was conducted on samples BH102_3.0-3.2, BH102_4.0-4.2 and BH102_5.0-5.2.

Chromium reducible sulfur (Scr) results reported below the limit of reporting (0.005%) and the action criteria (0.03%) and therefore the material not considered to be consistent with PASS.

Based on multiple lines of evidence, potential or actual ASS soils are unlikely to be present on-site.

Table 10-1 Summary sPOCAS laboratory analytical results

Analysis	BH101M_0.6-0.8	BH101M_1.6-1.8	BH102_3.0-3.2	BH102_4.0-4.2	BH102_5.0-5.2	ASSMAC (1998) Criteria ³
pH	7.1	5.1	4.8	4.5	4.7	<4.0
Peroxide pH	5.8	3.8	4.7	4.0	4.6	<3.0
pH KCl ¹	6.9	5.5	4.7	4.0	4.5	<4.0
pH Ox ²	6.3	5.0	4.6	4.5	4.5	<3.5
Total Actual Acidity (mol H ⁺ /tonne) - TAA	<5	40	27	130	42	NR
Total Potential Acidity (mol H ⁺ /tonne) - TPA	<5	50	37	137	45	18
Total Sulfidic Acidity (mol H ⁺ /tonne) - TSA	<5	10	10	7	<5	18
KCl extractable sulfur (% w/w) - S _{KCl}	<0.005	<0.005	<0.005	<0.005	<0.005	NR
Peroxide sulfur (% w/w) - S _P	0.005	<0.005	0.072	0.032	0.060	NR
Peroxide oxidisable sulfur (% w/w) - S _{Pos}	<0.005	<0.005	0.070	0.031	0.059	0.03
Chromium Reducible Sulphur (Scr) %	-	-	<0.005	<0.005	<0.005	0.03

Notes:

¹ for Actual Acid Sulfate Soil

² Indicative value only, for Potential Acid Sulfate Soils.

³ Action Criteria that trigger the need to prepare an ASS management plan, derived from Table 4.4, Section 2, ASSs Assessment Guidelines (ASSMAC, 1998);

N.R. = no currently available criterion

11. Conclusions

The property located at 1112-1116 Barrenjoey Road, Palm Beach NSW was the subject of a Detailed Site Investigation that was conducted in order to assess the nature and degree of on-site contamination associated with current and former uses of the property.

Based on the findings of this assessment it was concluded that:

- The site is located approximately 32km north of the Sydney central business district and is situated within the Local Government Area of Northern Beaches Council. The site is identified as Lot 21 in DP571298 and occupies a total area of approximately 1,400 m² presented in **Figure 2 (Appendix A)**;
- The allotment known as 1112-1116 Barrenjoey Road, Palm Beach NSW appears to have been used for residential purpose until 1979. The site was redeveloped for commercial purposes after 1979;
- An application to access records held by Northern Beaches Council was still pending at the time of report writing. Should pertinent information be identified upon receipt of Council records, an addendum to the DSI will be prepared and issued;
- A search of SafeWork NSW records did not identify records pertaining to dangerous goods or UPSS for the site;
- The site was free of statutory notices issued by the EPA, and was not recorded on the List of NSW Contaminated Sites Notified to EPA;
- Soil sampling and analysis were conducted at six borehole locations. The sampling regime was considered to be appropriate for detailed investigation purposes and comprised a generally systematic (triangular grid) sampling pattern within accessible areas and with allowance for structural obstacles (e.g. buildings, services, and other physical obstructions in use by existing operating businesses);
- Soil sample results reported Asbestos in shallow fill at EBH103 and EBH104;
- Soil sample results reported zinc in shallow fill at EBH103 at a concentration that exceeded adopted Ecological-based Investigation Levels (EILs);
- The asbestos and zinc report in shallow fill is likely due to weathering fallout from the adjacent building and therefore localised;
- Chromium, copper, nickel and zinc were reported in groundwater at concentrations exceeding adopted ecological criteria (marine). Chromium, copper and zinc were reported at relatively low concentrations there were typical of background conditions of urban environments. Nickel was reported at elevated concentration; however, low concentrations in soil indicate that the site is unlikely to be contributing to the reported concentration in groundwater;
- Minor petroleum hydrocarbon (as TRH-F2) was reported in groundwater, This presents a low risk to human health and ecological receptors;
- Soils were assessed for acid sulfate soils, and were not found to be actual or potential acid sulfate soils; and

- Based on the analytical results, the following preliminary classifications were provided (with reference to the EPA (2014) *Waste Classification Guidelines*):
 - The fill materials in the vicinity of EBH103 and EBH104 can be classified as *General Solid Waste (GSW) / Asbestos Waste* and remaining fill on the site can be classified as *General Solid Waste (GSW)*;
 - The underlying natural soils on the site can be classified as *Virgin Excavated Natural Material (VENM)*.

Based on the findings of this DSI, which was conducted in accordance with the investigation scope agreed with the Client, and with consideration of the Statement of Limitations (**Section 13**), bonded asbestos was identified which will require remediation in fill at EBH103 and EBH104.

EI note that the site contamination issues can be managed through the development application process in accordance with the State Environmental Planning Policy 55 (SEPP 55) – Remediation of Land, with the requirements for further investigation, remediation, and validation incorporated into conditions of development consent.

12. Recommendations

EI consider that the site can be made suitable for the proposed development, subject to the following recommendations:

- Conduct a Hazardous Materials Survey (HMS) of current site structures prior to demolition works;
- Clearance Inspection should be conducted following site building demolition and removal of all asbestos impacted fill in the vicinity of EBH103 and EBH104;
- Any soil materials being removed from site (including virgin excavated natural materials or VENM) be classified for off-site disposal in accordance with the EPA (2014) Waste Classification Guidelines;
- Dewatering may be required if the proposed development includes construction of a basement. This would require:
 - › Preparation of a Dewatering Management Plan (DMP) and approval from local Council and WaterNSW;
 - › On-going monitoring during any dewatering in accordance with the DMP; and
 - › Following completion of dewatering preparation of a Dewatering Completion Report summarising the on-going monitoring works.

13. Statement of limitations

This report has been prepared for the exclusive use of Palmdev 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 Palmdev 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 Palmdev 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.

This report and associated documents remain the property of EI subject to payment of all fees due for this assessment. The report shall not be reproduced except in full and with prior written permission by EI.

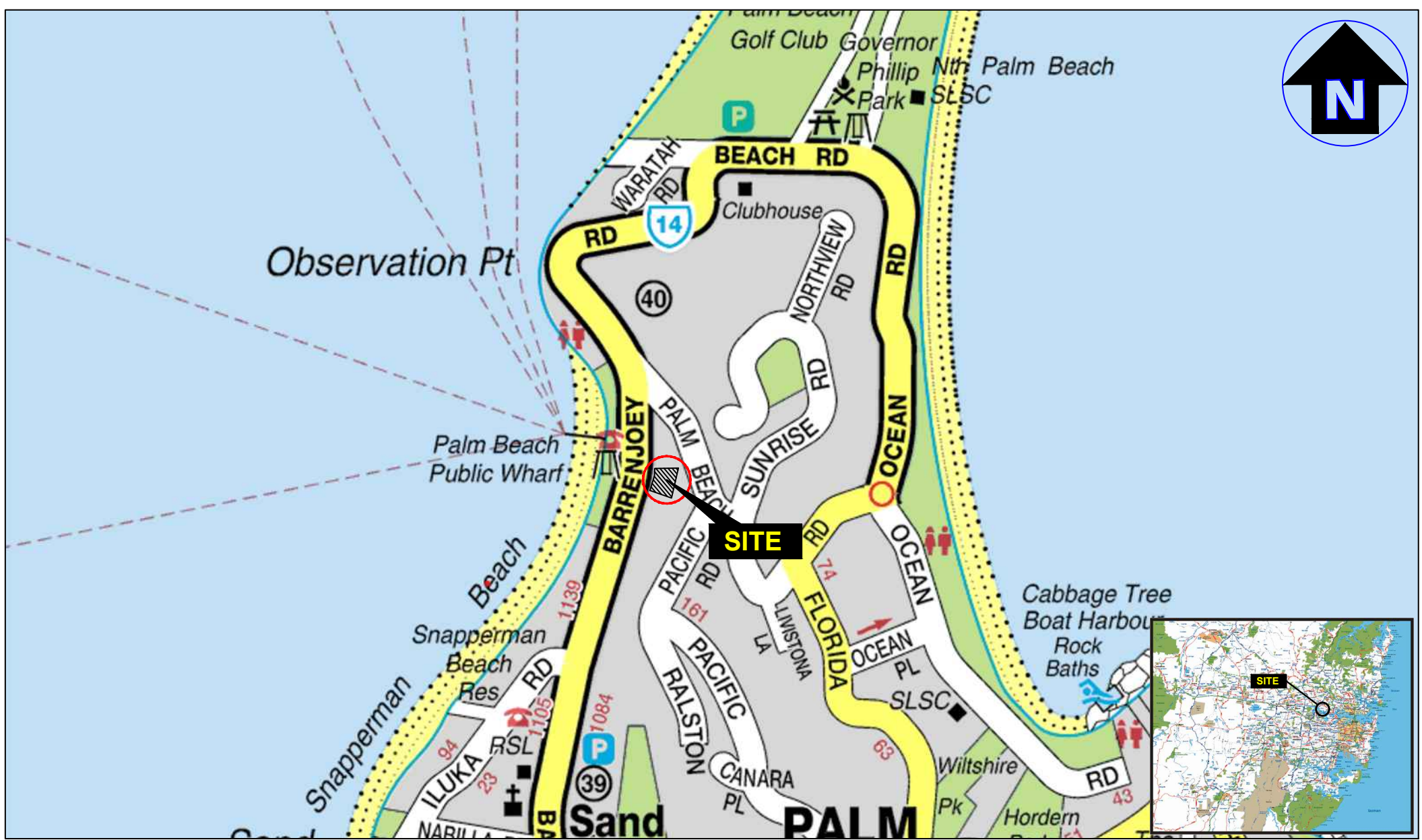
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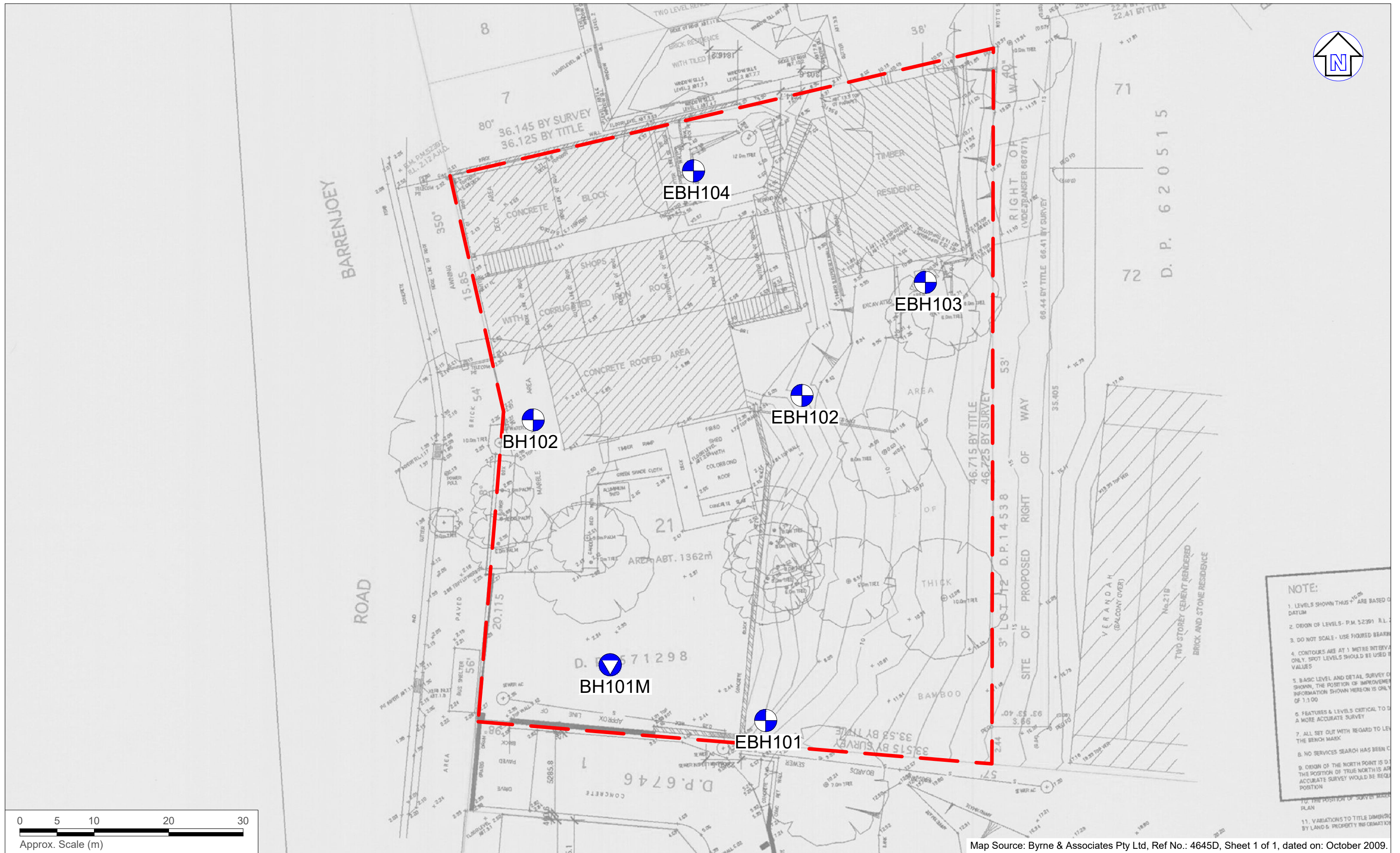
Abbreviations

ACM	Asbestos-containing materials
ASS	Acid sulfate soils
AST	Aboveground Storage Tank
B(a)P	Benzo(a)pyrene (a PAH compound), - B(a)P TEQ Toxicity Equivalent Quotient
BH	Borehole
BTEX	Benzene, Toluene, Ethylbenzene, Xylene
CLM	Contaminated Land Management
COC	Chain of Custody
COPC	Contaminants of Potential Concern
DEC	Department of Environment and Conservation, NSW (see OEH)
DECC	Department of Environment and Climate Change, NSW (see OEH)
DECCW	Department of Environment, Climate Change and Water, NSW (see OEH)
DA	Development Application
DP	Deposited Plan
EC	Electrical Conductivity
EIL	Ecological Investigation Level
EPA	Environment Protection Authority
ESL	Ecological Screening Level
F1	TRH C ₆ – C ₁₀ less the sum of BTEX concentrations (Ref. NEPM 2013, Schedule B1)
F2	TRH >C ₁₀ – C ₁₆ less the concentration of naphthalene (Ref. NEPM 2013, Schedule B1)
HIL	Health-based Investigation Level
HSL	Health-based Screening Level
km	Kilometres
m	Metres
mAHD	Metres Australian Height Datum
mBGL	Metres Below Ground Level
mg/L	Milligrams per litre
NATA	National Association of Testing Authorities, Australia
NEPC	National Environmental Protection Council
NSW	New South Wales
OEH	Office of Environment and Heritage, NSW (formerly DEC, DECC, DECCW)
PAHs	Polycyclic Aromatic Hydrocarbons
pH	Measure of the acidity or basicity of an aqueous solution
POEO	Protection of the Environment Operations
PQL	Practical Quantitation Limit (limit of detection for respective laboratory instruments)
QA/QC	Quality Assurance / Quality Control
SRA	Sample receipt advice (document confirming laboratory receipt of samples)
TDS	Total dissolved solids (a measure of water salinity)
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
USEPA	United States Environmental Protection Agency
UPSS	Underground Petroleum Storage System
UST	Underground Storage Tank
VOCs	Volatile Organic Compounds (specific organic compounds which are volatile)

Appendix A - Figures



Drawn:	T.M.
Approved:	K.X.
Date:	28-06-21
Scale:	Not To Scale



LEGEND (Note: All locations are approximate)

- - - Site boundary
- Borehole location
- Monitoring well location



Drawn:	A.N./T.M.
Approved:	EW
Date:	28-06-21

Palmdev Pty Ltd
Detailed Site Investigation
1112-1116 Barrenjoey Road, Palm Beach NSW
Borehole Location Plan

Figure:

A2

Project: E25203.E02

Appendix B - Tables

Table T1 - Summary of Soil Analytical results - within the proposed basement footprint

Sample ID	Material	Date	Heavy Metals							PAHs				BTEX				TRH					Pesticides		Total PCBs	Asbestos				
			As	Cd	Cr	Cu	Pb	Hg	Ni	Zn	Carcinogenic PAHs (as B(a)P TEO)	Benzo(a)pyrene	Total PAHs	Naphthalene	Benzene	Toluene	Ethylbenzene	Total Xylenes	F1	F2	F3	F4	C6 - C9	C10 - C36			OCPs	OPPs		
BH101M_0.1-0.2	Fill	11/06/2021	3	<0.3	15	1	7	<0.05	2.3	12	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<20	<110	<1	<1.7	<1	No			
BH101M_0.6-0.8	Natural		3	<0.3	9.8	2.1	5	<0.05	2.4	11	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<20	<110	N.A.	N.A.	N.A.	N.A.			
BH102_0.15-0.25	Fill		3	<0.3	12	4.1	10	<0.05	1.8	17	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<20	<110	<1	<1.7	<1	No			
BH102_0.8-1.0	Natural	18/06/2021	4	<0.3	4.3	1.9	3	<0.05	0.8	10	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<20	<110	N.A.	N.A.	N.A.	N.A.			
EBH101_0.1-0.2	Fill		2	<0.3	11	10	23	<0.05	0.7	45	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<20	<110	<1	<1.7	<1	No			
EBH102_0.1-0.2	Fill		2	<0.3	9.6	3.6	16	<0.05	0.6	38	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<20	<110	<1	<1.7	<1	No			
EBH103_0.1-0.2	Fill		4	<0.3	14	8.4	23	0.06	1.7	530	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<20	<110	<1	<1.7	<1	Yes			
EBH104_0.1-0.2	Fill		4	<0.3	9.4	31	40	0.15	3	150	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<20	<110	<1	<1.7	<1	Yes			
Statistical Analysis			4	<0.3	15	31	40	0.15	3	530	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<20	<110	<1	<1.7	<1	Yes			
Maximum concentration			4	<0.3	15	31	40	0.15	3	530	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<20	<110	<1	<1.7	<1	Yes			
Waste Classification Assessment Criteria																														
NSW EPA 2014 General Solid Waste	CT1 (mg/kg) ¹	100	20	100		100	4	40		0.8	200		10	288	600	1,000					650	10,000	<50	250	<50	NR				
	TCLP1 (mg/L)	5	1	5		5	0.2	2		0.04	NR		0.5	14.4	30	50					NR	NR	NR	NR	NR	NR				
	SCC1 (mg/kg) ³	500	100	1,900		1,500	50	1050		10	200		18	518	1,080	1,800					650	10,000	<50	250	<50	NR				
NSW EPA 2014 Restricted Solid Waste	CT2 (mg/kg) ²	400	80	400 ⁵		400	16	160		3.2	800		40	1,152	2,400	4,000					2,600	40,000	<50	1000	<50	NR				
	TCLP2 (mg/L)	20	4	20		20	0.8	8		0.2	NR		2	58	120	200					NR	NR	NR	NR	NR	NR				
	SCC2 (mg/kg) ⁴	2,000	400	7,600		6,000	200	4200		23	800		72	2,073	4,320	7,200					2,600	40,000	<50	1000	<50	NR				
Special Waste / Scheduled Waste																						> 2 mg/kg - Scheduled Waste ⁵		> 2 mg/kg - PCB Waste ⁶	Where detected classification is Special Waste (Asbestos Waste)					
SILs																														
HIL B - Residential		500	150	500 Cr(VI)	30,000	1,200	120	1,200	60,000	4		400															600		1	
HSL D - Commercial / Industrial Soil texture classification - Sand ⁷	Source depths (0 m to <1 m. BGL)											NL	3	NL	NL	230	260	NL												
	Source depths (1 m to <2 m. BGL)											NL	3	NL	NL	NL	370	NL												
	Source depths (2m to <4 m. BGL)											NL	3	NL	NL	NL	630	NL												
	Source depths (4 m+)											NL	3	NL	NL	NL	NL	NL												
EILs / ESLs - Residential ^{8,9}		100		205	90	1260		35	190			170	50	85	70	105	180	120	300	2800			180							
CRC Care - High Reliability Ecological Criteria for Benzo(a)pyrene													33																	
Management Limits - Residential, parkland and public open space Coarse grained soil texture ¹													700	1000	2500	10000														

Notes:

All results are recorded in mg/kg (unless otherwise stated)



Waste Classification Criteria met
 Highlighted values indicates concentration exceeds Human Health Based Soil Criteria (HIL B / HSL D / Management Limits)
 Highlighted values indicates concentration exceeds EIL
 Highlighted indicates criteria exceeded

HIL B
 HSL D
 N.A.
 NL
 1
 2
 3
 4
 5
 6
 7
 8
 9
 F1
 F2
 F3
 F4

NEPC 2013 'HIL B' - Health based Residential with minimal garden/accessible soil, also includes dwellings with fully and permanently paved yard space such as high-rise buildings and apartments.
 NEPC 2013 'HSL D' Health Based Screening Levels applicable for vapour intrusion values applicable for Commercial/Industrial settings.
 'Not Analysed' i.e. the sample was not analysed.
 'Not Limiting' - The soil vapour limit exceeds the soil concentration at which the pore water phase cannot dissolve any more of the individual chemical.
 NSW EPA 2014 CT1 General Solid Waste Thresholds (without leachate test), in Waste Classification Guidelines, Table 1
 NSW EPA 2014 CT2 Maximum values for Leachable concentration and specific contaminant concentration for Restricted Solid Waste Thresholds, Waste Classification Guidelines Table 1
 NSW EPA 2014 TCLP1/SCC1 General Solid Waste Thresholds (leachable concentration and total concentration when used together), in Waste Classification Guidelines Table 2
 NSW EPA 2014 TCLP2/SCC2 Restricted Solid Waste Thresholds (leachable concentration and total concentration when used together), in Waste Classification Guidelines Table 2
 NSW EPA Scheduled Chemical Wastes Chemical Control Order 2004, Section 4.14
 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.
 Coarse Grained soil (Sand) values were applied.
 Fill was found to be sandy material. Therefore soil values for the sand was applied (coarse grained).
 As no physiochemical properties were analysed the most conservative values were adopted for EILs.
 To obtain F1 subtract the sum of BTEX concentrations from the C6-C10 fraction.
 To obtain F2 subtract Naphthalene from the >C10-C16 fraction.
 (>C16-C34)
 (>C34-C40)



Table T2 – Summary of Groundwater Investigation Results

Sample Identification	Date	Heavy Metals								PAHs			VOCs				BTEX				TRHs					
		As	Cd	Cr	Cu	Pb	Hg	Ni	Zn	Total PAHs	Benzo(a)pyrene	Naphthalene	Chloroform (THM)	1,2,4-trimethylbenzene	1,3,5-trimethylbenzene	Other VOCs	Total VOC	Benzene	Toluene	Ethylbenzene	xylene	F1	F2	F3	F4	
BH101M	18/06/2021	<1	0.2	5	15	2	<0.0001	470	130	<1	<0.1	<0.1	2.5	15	6.7	<LOR	30	<0.5	<0.5	<0.5	2.7	<50	<60	<500	<500	
GILs												NL					5000	NL	NL	NL	6000	NL				
HSL D for Commercial/Industrial⁴												NL					5000	NL	NL	NL	6000	NL				
GIL	Marine Water³		0.7	4.4(Cr IV)	1.3	4.4	0.1 ²	7	15 ¹		50 ¹					500 ¹	180 ⁶	5 ⁶		50 ⁵	60 ⁵	500 ⁵	500 ⁵			
Drinking Water⁷		1000	200	5000	200000	1000	100	2000				300					100	80000	30000	60000						

Notes:

All values are µg/L unless stated otherwise

NL = Not Limiting

NA = 'Not Analysed' i.e. the sample was not analysed.

LOR Limit of Reporting

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)

1 = Figure may not protect key species from chronic toxicity, refer to ANZG 2018 for further guidance

2 = Chemical for which possible bioaccumulation and secondary poisoning effects should be considered, refer to ANZG 2018 for further guidance

3 = NEPM (2013) Groundwater Investigation Levels for marine water quality, based on ANZG 2018.

4 = NEPM (2013) Table 1A(4) Groundwater HSL D for vapour intrusion at the contaminant source depth ranges in sand 2m to <4m, as a conservative approach.

5 = In lack of a criteria the laboratory PQL has been used (DEC, 2007).

6 = Low reliability toxicity data, refer to ANZG 2018

7 = Drinking Water value has been used multiplied by a factor of 100 to address the secondary contact recreation (NHMRC, 2016).



Highlighted Indicates concentration value exceeding the Groundwater Investigation Level for Marine Water

Highlighted indicates criteria exceeded

Appendix C - Groundwater Bore Search

Groundwater Bores

- Groundwater works
- ◆ Telemetered bores
- ▲ Logged bores
- Manual bores

Monitoring Bore Types

- Alluvial
- Coastal Sands
- Fractured Rock
- Porous Rock
- Great Artesian Basin
- Discontinued

There are **19 sites** within 500 metres of the selected point. ✕

The 5 closest sites are shown below. Show all 19 sites

GW105823
GW112524
GW110407
GW106383
GW105595

- Roadmap
- Terrain
- Satellite
- Hybrid

- Groundwater Works
- Monitoring Bores
- Telemetered Bores
- Coal Basin Bores
- Discontinued Bores



Appendix D - Site Photographs



Photograph 1: View of timber house and bamboo bush facing south (18/06/2021).



Photograph 2: Location of EBH104 (lawn area for the house), facing northwest (18/06/2021).



Photograph 3: Concrete stair and walkway, facing west (18/06/2021).



Photograph 4: Timber house on site, facing east (18/06/2021).



Photograph 5: Brick retaining wall at carpark area, facing northeast (18/06/2021).



Photograph 6: Carpark at rear of the shops, facing northeast (18/06/2021).



Photograph 7: Dense bush at eastern portion of the site, facing south (18/06/2021).

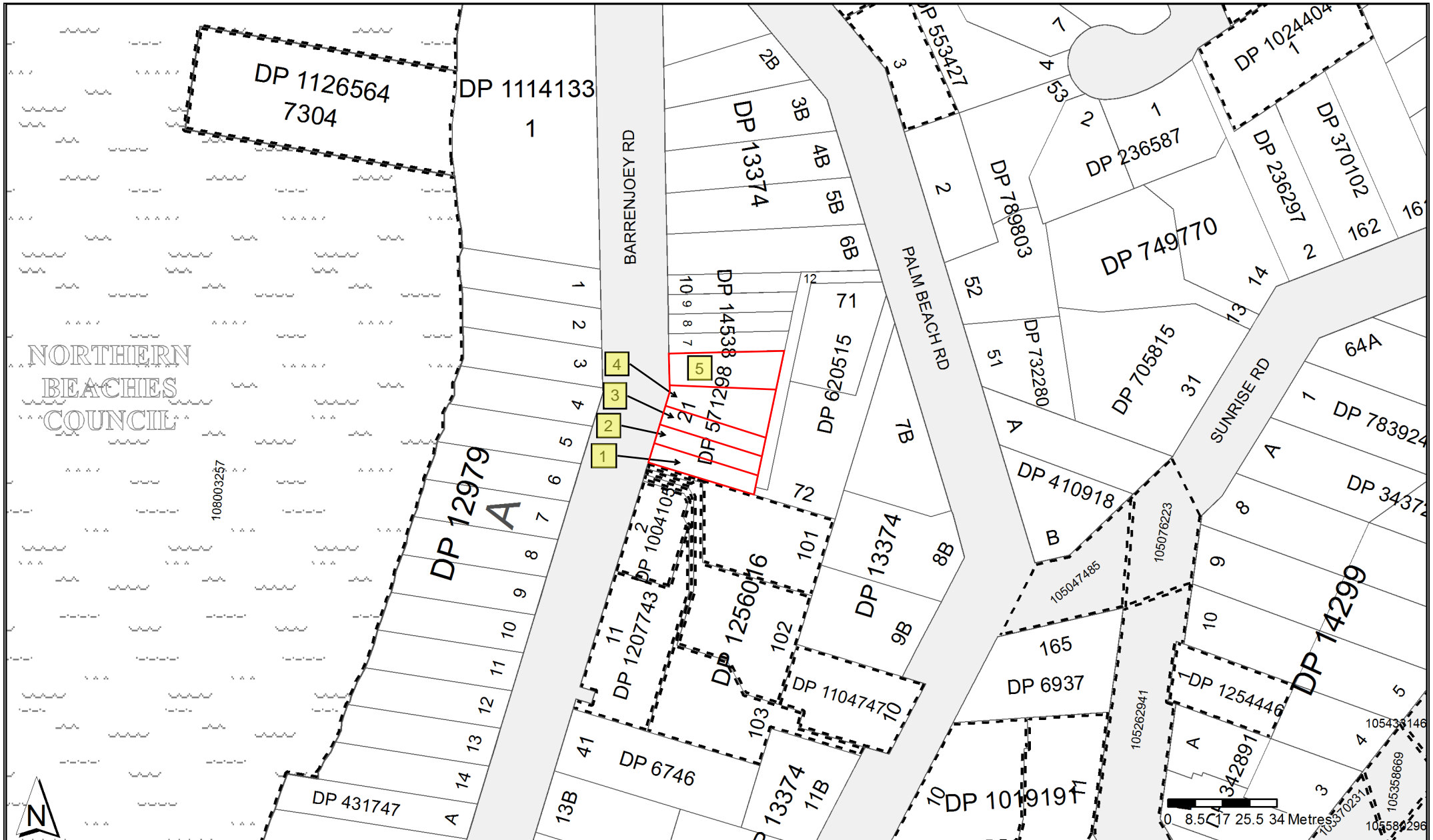


Photograph 8: Fibro-cement piece on the surface near EBH103 (18/06/2021).



Photograph 9: View of roof of the shops, facing west (18/06/2021).

Appendix E - Historical Property Titles Search





10688176

CERTIFICATE OF TITLE
PROPERTY ACT, 1900, as amended.

NEW SOUTH WALES

Vol. **10688** Fol. **176**
Edition issued 27-11-1967



AS K772774 **CANCELLED**



Jawatson
Registrar General.

Appln. No. 17737

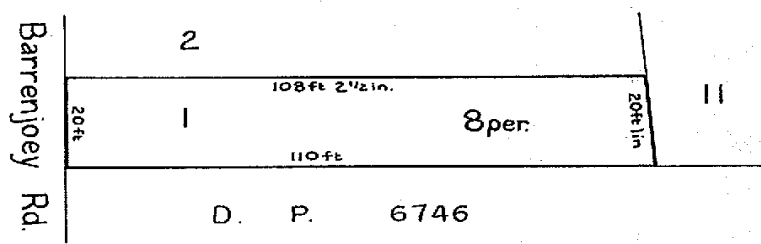
Prior Title Vol. 2823 Fol. 150

10688 Fol. 176
(Page 1) Vol.

I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

Witness *M. Saltar*

PLAN SHOWING LOCATION OF LAND



K772774 *lf*

Scale: 30 feet to one inch.

ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Lot 1 in Deposited Plan 14530 in the Shire of Warringah Parish of Narrabeen and County of Cumberland being part of Portion 18 granted to James Napper on 16-3-1816.

FIRST SCHEDULE (continued overleaf)

~~BLWYN LEAMINGTON BLAIS of North Narrabeen, Retired.~~

SECOND SCHEDULE (continued overleaf)

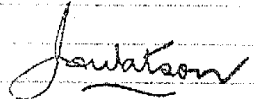

1. Reservations and conditions, if any, contained in the Crown Grant above referred to.

Jawatson
Registrar General

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON

WARNING THIS DOCUMENT MUST NOT BE REMOVED FROM THE LAND TITLES OFFICE

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT			ENTERED	Signature of Registrar-General
	NATURE	NUMBER	DATE		
<i>Carter Pty Limited</i>	<i>Transfer</i>	<i>L631642</i>	<i>3.10.1969</i>	<i>24. 11. 1969</i>	<i>Jawatson</i>
<p>This deed is cancelled as to <i>the whole</i></p> <p>New Certificates of Title <i>was</i> issued <i>on 29.8.1974</i> for lots in</p> <p><i>Deposited</i> Plan No. <i>571298</i> as follows:-</p> <p>Lots <i>21</i> Vol. <i>NS27</i> Fol. <i>3</i></p>					
 REGISTRAR GENERAL				<p><i>L631642</i></p> <p><i>R-L-11</i></p> <p><i>N885932</i></p> <p><i>DP571298</i></p> <p><i>8/29/2/74</i></p> <p><i>Reg</i></p> <p><i>Nealy</i></p>	

SECOND SCHEDULE (continued)

NATURE	INSTRUMENT		PARTICULARS	ENTERED	Signature of Registrar-General	CANCELLATION		
	NUMBER	DATE						
Mortgage	L631643	30.10.1969	to Elwyn Leamington Lister of North Narrabeen, Retired	24. 11. 1969	Jawatson	Discharged	m986207	Jawatson
Mortgage	m986208	2.11.1972	to Edna Jean Aurora Lister of North Coast Coast, Widow	23.11.1973	Jawatson	Discharged	N885932	Jawatson

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR-GENERAL ARE CANCELLED

Vol. 10688 Fol 176

(Page 2 of 2 pages)

Reg: R14901 / Doc: CT 10688-176 CT / Rev: 13-Jan-2011 / NSW IRS / Pgs: All / Pnt: 01-Jul-2021 21:49 / Seq: 2 of 2
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CERTIFICATE OF TITLE
PROPERTY ACT, 1900, as amended.



10688177

NEW SOUTH WALES

Appln. No.17737

Prior Title Vol.2823 Fol.150

Vol. **10688** Fol. **177**
Edition issued 27-11-1967



AS K772774 **CANCELLED**

10688 Fol. 177

(Page 1) Vol.

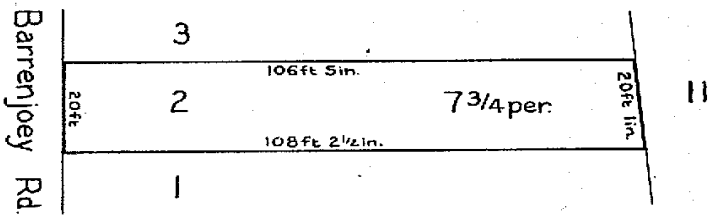
I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

Witness *M. Walter*

Jawatson
Registrar General.



PLAN SHOWING LOCATION OF LAND



K772774 LF

Scale: 30 feet to one inch.

ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Lot 2 in Deposited Plan 14538 in the Shire of Warringah Parish of Narrabeen and County of Cumberland being part of Portion 18 granted to James Napper on 16-3-1816.

FIRST SCHEDULE (continued overleaf)

~~ELWYN LEAMINGTON ELLIS of North Narrabeen, Retired.~~

SECOND SCHEDULE (continued overleaf)

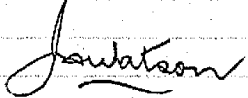

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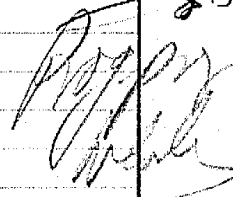
Jawatson
Registrar General

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FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT			ENTERED	Signature of Registrar-General
	NATURE	NUMBER	DATE		
Carter Pty Limited	Transfer	L631642	3.10.1969	24.11.1969	Jawatson
This deed is cancelled as to <u>the whole</u> New Certificates of Title <u>has</u> <u>298-1374</u> have <u>issued</u> for lots in Deposited Plan No. <u>571298</u> as follows:- Lots <u>21</u> Vol. <u>NSW</u> Fol. <u>3</u> respectively					
  REGISTRAR GENERAL					

L631642
 R-63
 M986207
 108
 N885932
 275729
 219197


SECOND SCHEDULE (continued)

NATURE	INSTRUMENT		PARTICULARS	ENTERED	Signature of Registrar-General	CANCELLATION	
	NUMBER	DATE					
Mortgage	L631643	30.10.1969	to Elwyn Leanington Ellis of North Naraburra, Retired 	24.11.1969	Jawatson	Discharged	M986207 Jawatson
Mortgage	M986208	2.11.1972	to Edna Jean Aurora Potter of North Park East, Widowed 	23.11.1972	Jawatson	Discharged	N885932 Jawatson

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR-GENERAL ARE CANCELLED

10688178



CERTIFICATE OF TITLE
PROPERTY ACT, 1900, as amended.

NEW SOUTH WALES

Appln. No.17737

Prior Title Vol.2823 Fol.150



Vol. **10688** Fol. **178**
Edition issued 27-11-1967
AS **K772774** **CANCELLED**

10688 Fol. 178

(Page 1) Vol.

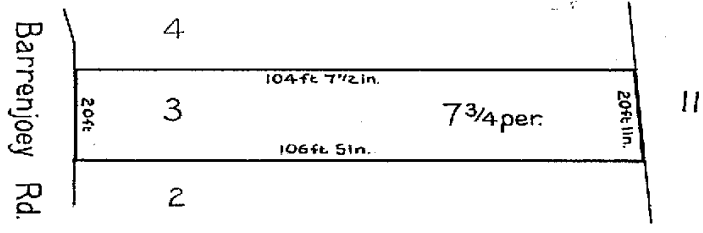
I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

Witness *msalter*

Jawatson
Registrar General.



PLAN SHOWING LOCATION OF LAND



K772774 *lf*

Scale: 30 feet to one inch.

ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Lot 3 in Deposited Plan 14538 in the Shire of Warringah Parish of Narrabeen and County of Cumberland being part of Portion 18 granted to James Napper on 16-3-1816.

FIRST SCHEDULE (continued overleaf)

~~ELWYN LEAMINGTON ELLIS of North Narrabeen, Retired.~~

SECOND SCHEDULE (continued overleaf)

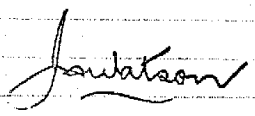

1. Reservations and conditions, if any, contained in the Crown Grant above referred to.

Jawatson
Registrar General

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FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT			ENTERED	Signature of Registrar-General
	NATURE	NUMBER	DATE		
<i>Carter Pty Limited</i>	<i>Transfer</i>	<i>L6316423</i>	<i>30.10.1969</i>	<i>24. 11. 1969</i>	<i>Joubaton</i>
<p>This deed is cancelled as to <i>the whole</i></p> <p>New Certificate of Title <i>has</i> issued <i>25.8.1974</i> for lots in</p> <p><i>Deposit</i> Plan No. <i>571298</i> as follows:-</p> <p>Lots <i>21</i> Vol. <i>12527</i> Pol. <i>3</i> respectively</p>					
 REGISTRAR GENERAL				<p><i>L6316423</i></p> <p><i>K-05</i></p> <p><i>M98207</i></p> <p><i>702</i></p> <p><i>N885932</i></p> <p><i>27.5.72</i></p> <p><i>15/3/71</i></p> <p><i>P. Joubaton</i></p>	

SECOND SCHEDULE (continued)

NATURE	INSTRUMENT		PARTICULARS	ENTERED	Signature of Registrar-General	CANCELLATION	
	NUMBER	DATE					
<i>Mortgage</i>	<i>L631643</i>	<i>30.10.1969</i>	<i>to Elwyn Leanington Ellis of North Narrabeen, NSW</i>	<i>24. 11. 1969</i>	<i>Joubaton</i>	<i>Discharged</i>	<i>M98207</i>
<i>Mortgage</i>	<i>M98208</i>	<i>2. 11. 1972</i>	<i>To Edna Jean Austin Rutter of North Curl Curl, NSW</i>	<i>23. 11. 1972</i>	<i>Joubaton</i>	<i>Discharged</i>	<i>N885932</i>

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR-GENERAL ARE CANCELLED

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Page 2 of 2 pages

Reg: R14899 / Doc: CT 10688-178 CT / Rev: 13-Jan-2011 / NSW IRS / Pgs: All / Pnt: 01-Jul-2021 21:49 / Seq: 2 of 2
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10688179



NEW SOUTH WALES

CERTIFICATE OF TITLE
PROPERTY ACT, 1900, as amended.

Vol. **10688** Fol. **179**
Edition issued 27-11-1967
AS K772774 **CANCELLED**

Appln. No.17737
Prior Titles Vol.2823 Fol.150
Vol.3792 Fol.148



10688 Vol. 179
(Page 1) Vol.

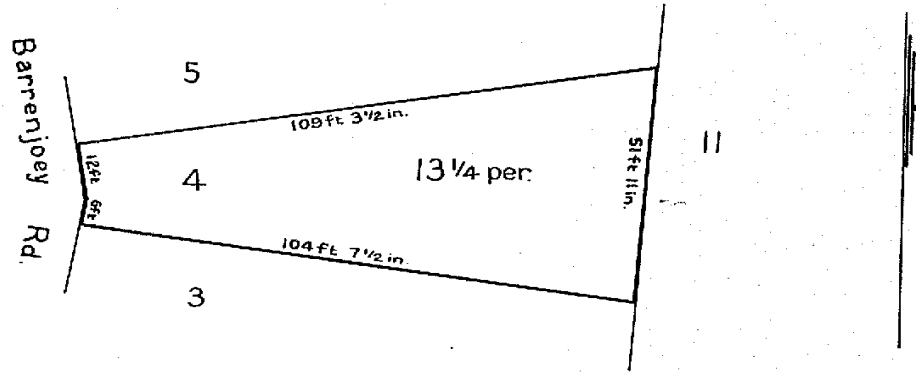
I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

Witness *Mrs Alter*

Jawatson
Registrar General.



PLAN SHOWING LOCATION OF LAND



K772774 *lf*

Scale: 30 feet to one inch.

ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Lot 4 in Deposited Plan 14538 in the Shire of Warringah Parish of Narrabeen and County of Cumberland being part of Portion 18 granted to James Napper on 16-3-1816.

FIRST SCHEDULE (continued overleaf)

~~ELWIN BEAMINGTON ELLIS of North Narrabeen, Retired.~~

SECOND SCHEDULE (continued overleaf)

- 1. Reservations and conditions, if any, contained in the Crown Grant above referred to.

Jawatson
Registrar General

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON

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10822001

NEW SOUTH WALES

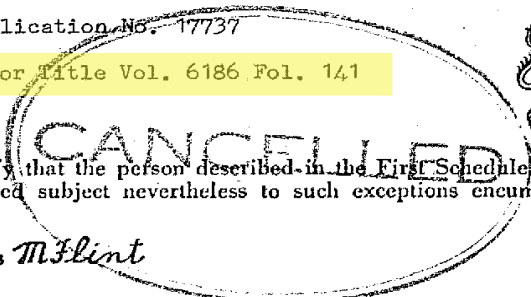
CERTIFICATE OF TITLE
PROPERTY ACT, 1900, as amended.



Vol. 10822 Fol. 1
MF Edition issued 20-6-1968
L70096 **CANCELLED**

Application No. 17737

Prior Title Vol. 6186 Fol. 141



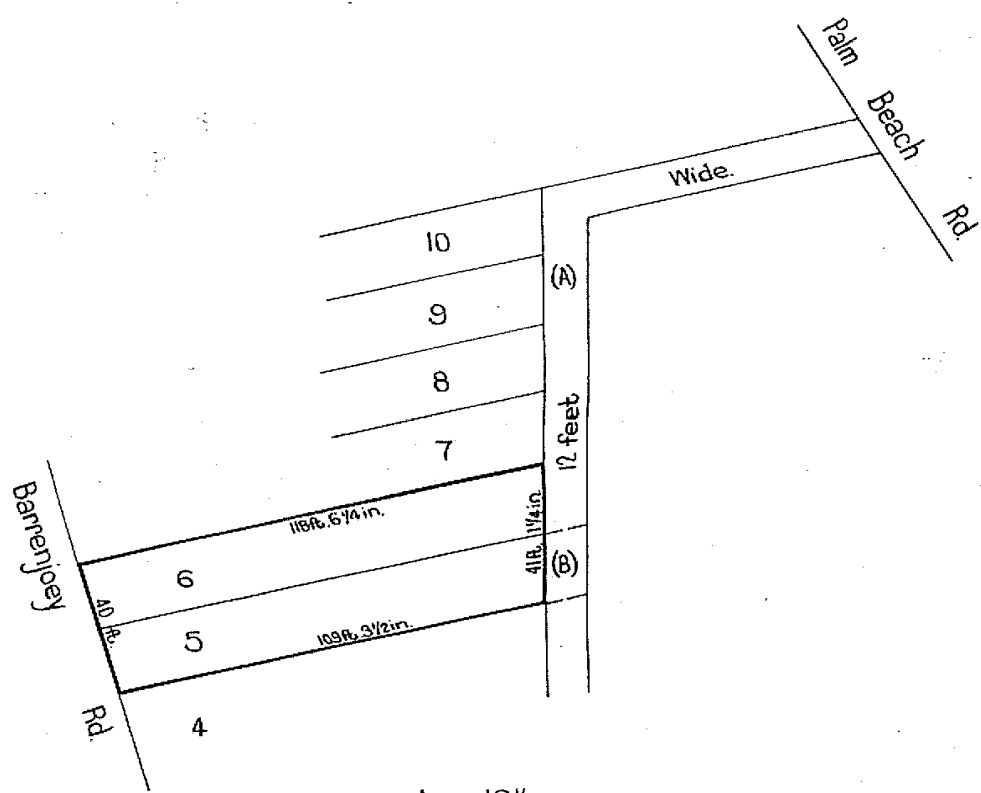
I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

Witness *M. Flint*

Jawatson
Registrar General.



PLAN SHOWING LOCATION OF LAND



Area: 16 1/2 per.

Scale: 40 feet to one inch.

ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Lots 5 and 6 in Deposited Plan 14538 in the Shire of Warringah, Parish of Narrabeen and County of Cumberland being part of Portion 18 granted to James Napper on 16-3-1816.

FIRST SCHEDULE (continued overleaf)

~~EDWARD VICTOR KEITH WALLMAN, of North Avalon, Carpenter and VALERIE DAWN WALLMAN, his wife as Joint Tenants.~~

SECOND SCHEDULE (continued overleaf)

1. Reservations and conditions, if any, contained in the Crown Grant above referred to.
2. Right of Way created by Transfer No. B566414 appurtenant to Lot 6 above described affecting the piece of land 12 feet wide designated (A) in the plan hereon.
3. Covenants created by Transfers Nos. B566414 and B687671 (affecting parts).
4. Right of Way created by Transfer No. B687671 appurtenant to Lot 5 above described affecting the piece of land 12 feet wide designated (B) in the plan hereon.
5. ~~Mortgage No. K798266 to Alliance Acceptance Co. Limited. Entered 14 9 1967. Discharged 1 4 60 3 55~~

Jawatson
Registrar General.

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

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10822 Vol. 1 (Page 1)

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR

*Quatic Limited
Carsteel Pty Limited*

NATURE	INSTRUMENT		ENTERED	Signature of Registrar-General
	NUMBER	DATE		

<i>Transfer</i>	<i>L 650356</i>	<i>23-5-1969</i>	<i>7-7-1969</i>	<i>Jawatson</i>
<i>Transfer</i>	<i>L 866754</i>	<i>25-5-1970</i>	<i>9-6-1970</i>	<i>Jawatson</i>

This deed is cancelled as to *the whole*
 New Certificates of Title *new* on *29-8-1974* issued *here* for lots in
Deponza Plan No. *571298* as follows:-
 Lot *21* Vol. *12527* Fol. *3* respectively

Jawatson



REGISTRAR GENERAL

L 60804
with...
L 450355
L 866754
1974
N 885931
DP 57129
2/19/81

SECOND SCHEDULE (continued)

NATURE	INSTRUMENT		PARTICULARS	ENTERED	Signature of Registrar-General	CANCELLATION		
	NUMBER	DATE						
<i>Lease</i>	<i>L 60804</i>	<i>1-9-1967</i>	<i>lease of shop and dwelling known as No. 1116 Bassonjoe Road, Palm Beach (together with right) (with consent of mortgagee) to Pate John Kay Partridge of Pal. Bldg., Stonkspeers</i>	<i>22-10-1967</i>	<i>Jawatson</i>	<i>Expired</i>	<i>28-8-1974</i>	<i>Jawatson</i>
<i>Mortgage</i>	<i>L 450355</i>	<i>5-5-1969</i>	<i>to Hong Kong Finance Limited</i>	<i>7-7-1969</i>	<i>Jawatson</i>	<i>Discharged</i>	<i>M 941245</i>	<i>Jawatson</i>
<i>Mortgage</i>	<i>M 941245</i>	<i>9-10-1972</i>	<i>to Kathryn Margaret Blackwood of Durban wife of Henry Blackwood, Retired Merchant Marine Officer</i>	<i>24-10-1972</i>	<i>Jawatson</i>	<i>Discharged</i>	<i>N 885931</i>	<i>Jawatson</i>

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR-GENERAL ARE CANCELLED

Vol. 10822 Fol. 1

(Page 2 of 2 pages)

Reg: R14897 / Doc: CT 10822-001 CT / Rev: 14-Jan-2011 / NSM IRS / Pgs: ALL / Prt: 01-Jul-2021 21:49 / Seq: 2 OF 2
 © Office of the Registrar-General / Str: INFOTRACK / Ref: 1112-1116 Barronjoe Road

12527003



CERTIFICATE OF TITLE

NEW SOUTH WALES

REAL PROPERTY ACT, 1900

Vol. **12527** Fol. **3**

Edition issued 29-8-1974.

Appln No. 17737

Prior Titles Vol. 10688 Fols. 176, 177, 178 and 179
Vol. 10822 Fol. 1



12527 Fol. 3

I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

CANCELLED

Jawatson
Registrar General.

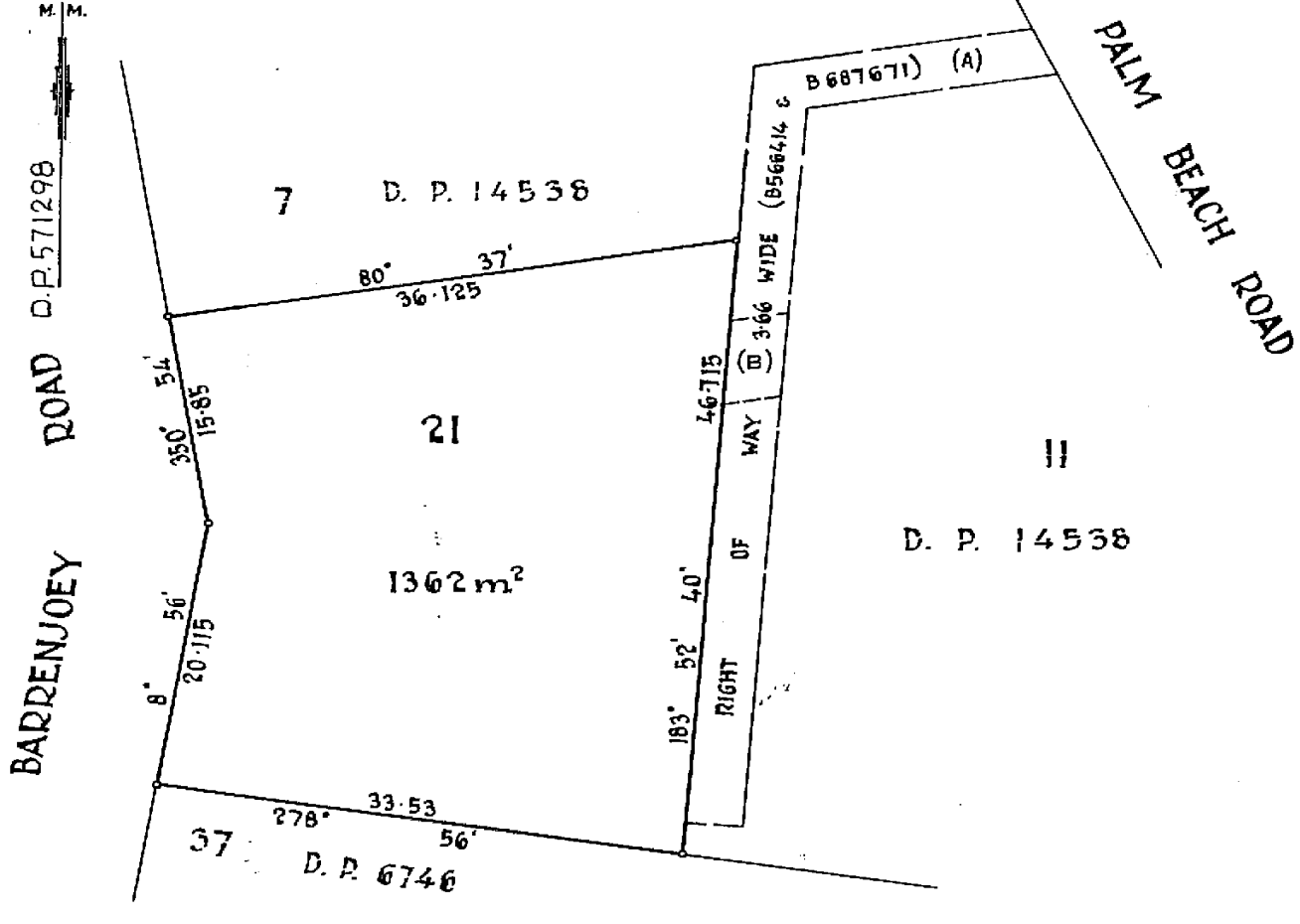


SEE ALSO BOND



PLAN SHOWING LOCATION OF LAND

LENGTHS ARE IN METRES



ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Lot 21 in Deposited Plan 571298 at Palm Beach in the Shire of Warringah Parish of Narrabeen and County of Cumberland being part of Portion 18 granted to James Napper on 16-3-1816.

FIRST SCHEDULE

CANTEC PTY. LIMITED.

SECOND SCHEDULE

- GRAY
- Reservations and conditions, if any, contained in the Crown Grant above referred to.
 - Right of Way created by Transfer No. B566414 appurtenant to part of the land above described affecting the part of the Right of Way 3.66 wide designated (A) in plan hereon.
 - Covenants created by Transfers Nos. B566414 and B687671 affecting parts.
 - Right of Way created by Transfer No. B687671 appurtenant to part of the land above described affecting the part of the Right of Way 3.66 wide designated (B) in plan hereon.

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON

WARNING: THIS DOCUMENT MUST NOT BE REMOVED FROM THE LAND TILES OFFICE.

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED.

X
 P428476
 R365866 v
 R
 R546216
 -171
 S561707
 -8
 -9
 T441772
 -30
 -42
 -56

T688121
 -122
 21.
 20 DEC 19
 T960770
 W525116
 (116412)
 X164403
 3/11/87

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT			ENTERED	Signature of Registrar General
	NATURE	NUMBER	DATE		
J.A. Atkinson Pty. Limited	Transfer	R546216		3-12-1979	
Harry Anastasopoulos and Maria Anastasopoulos in 1/2 share as joint tenants, Tony Anastasopoulos in 1/2 share, as tenants in common by Transfer	Transfer	S561708			
Registered 7-7-1981					
CANCELLED					
SEE INTO FILE					

SECOND SCHEDULE (continued)

NATURE	INSTRUMENT		PARTICULARS	ENTERED	Signature of Registrar General	CANCELLATION	
	NUMBER	DATE					
— Caveat	P428476			26-9-1975		Withdrawn	R365666
— Mortgage	R546217		to The Commercial Banking Company of Sydney Limited	3-12-1979		Discharged	S561707
S561709			Mortgage to Finance Corporation of Australia Limited. Registered 7-7-1981			Discharged	T688121
T441772			Lease to Reginald David Rose and Pamela Florence Rose as joint tenants of premises being Shop 2, 1118 Barrenjoey Road, Palm Beach, together with an option of renewal. Expires 30-6-1985. Registered 7-3-1983			Expired	26-9-1986
T441774			Lease to Robert Kerry Wood and Jann Elizabeth Wood as joint tenants of premises being Shop 1, 1118 Barrenjoey Road, Palm Beach, together with an option of renewal. Expires 17-10-1985. Registered 7-3-1983			Expired	23-11-1987
T688122 ^P			Mortgage to National Commercial Banking Corporation of Australia Limited. Registered 6-9-1983				
T441774			Lease between Now Michael Anthony Davis and John William Gibbons as tenants in common in equal shares by Transfer			Cancelled	X164403
W525116 ^P			Lease to Reginald David Rose and Pamela Florence Rose as joint tenants of premises being Shop 2, 1118 Barrenjoey Road, Palm Beach. Expires 30-6-1988. Option of renewal 3 years. Registered 26-9-1986.				
X164403 ^P			Lease to George Lambatas and Zoi Lambatas as joint tenants of premises being Shop 1, 1118 Barrenjoey Road, Palm Beach. Expires 22-12-1987 with an option of renewal for three years. Registered 23-11-1987.				

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

3
 Fol.
 12527
 Vol.

M
 (Page 2 of 2 pages)



SEARCH DATE

1/7/2021 9:47PM

FOLIO: 21/571298

First Title(s): SEE PRIOR TITLE(S)

Prior Title(s): VOL 12527 FOL 3

Recorded	Number	Type of Instrument	C.T. Issue
-----	-----	-----	-----
28/3/1988		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
8/8/1988		CONVERTED TO COMPUTER FOLIO	FOLIO CREATED CT NOT ISSUED
11/10/1988	X860678	LEASE	EDITION 1
16/5/1989	Y358379	LEASE	EDITION 2
25/7/1990	Z120762	LEASE	EDITION 3
23/4/1992	E405899	LEASE	EDITION 4
14/8/1992	E682014	LEASE	EDITION 5
29/4/1994	U221725	LEASE	EDITION 6
30/9/1994		AMENDMENT: LOCAL GOVT AREA	
31/8/1995	0501130	DISCHARGE OF MORTGAGE	
31/8/1995	0501131	LEASE	EDITION 7
20/9/1996	2476419	CAVEAT	
29/11/1996	2654659	LEASE	EDITION 8
22/4/1997	2980562	WITHDRAWAL OF CAVEAT	
10/6/1997	2893201	LEASE	EDITION 9
13/8/1997	3319361	LEASE	EDITION 10
16/9/1998	5268982	CHANGE OF NAME	
16/9/1998	5268983	MORTGAGE	EDITION 11
16/8/2002	8874474	SURRENDER OF LEASE	
16/8/2002	8874475	LEASE	EDITION 12
16/4/2008	AD884743	LEASE	EDITION 13

END OF PAGE 1 - CONTINUED OVER

SEARCH DATE

1/7/2021 9:47PM

FOLIO: 21/571298

PAGE 2

Recorded -----	Number -----	Type of Instrument -----	C.T. Issue -----
23/10/2009	AE818105	SURRENDER OF LEASE	
23/10/2009	AE970976	DISCHARGE OF MORTGAGE	
23/10/2009	AE970977	LEASE	EDITION 14
28/5/2010	AF521586	REQUEST	EDITION 15
8/11/2010	AF860274	LEASE	EDITION 16
27/2/2013	AH578652	DEPARTMENTAL DEALING	
21/8/2013	AH565852	REJECTED - APPLICATION FOR REPLACEMENT CERTIFICATE OF TITLE	
16/2/2015	AI334371	APPLICATION FOR REPLACEMENT CERTIFICATE OF TITLE	EDITION 17
13/10/2015	AJ897833	LEASE	EDITION 18
19/2/2016	AK233618	LEASE	
19/2/2016	AK233619	LEASE	EDITION 19
22/6/2021	AR165412	CAVEAT	

*** END OF SEARCH ***

1112-1116 Barrenjoey Road

PRINTED ON 1/7/2021



FOLIO: 21/571298

SEARCH DATE	TIME	EDITION NO	DATE
1/7/2021	9:47 PM	19	19/2/2016

LAND

LOT 21 IN DEPOSITED PLAN 571298
 AT PALM BEACH
 LOCAL GOVERNMENT AREA NORTHERN BEACHES
 PARISH OF NARRABEEN COUNTY OF CUMBERLAND
 TITLE DIAGRAM DP571298

FIRST SCHEDULE

ANASTASIOS ANASTASOPOULOS
 IN 1/2 SHARE
 HARRY ANASTASOPOULOS
 MARIA ANASTASOPOULOS
 AS JOINT TENANTS IN 1/2 SHARE
 AS TENANTS IN COMMON

(CN 5268982)

SECOND SCHEDULE (8 NOTIFICATIONS)

- 1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
- 2 B566414 RIGHT OF WAY APPURTENANT TO THE LAND ABOVE DESCRIBED AFFECTING THE SITE DESIGNATED (A) IN THE TITLE DIAGRAM
- 3 COVENANT B566414 AND B687671 AFFECTING PARTS
- 4 B687671 RIGHT OF WAY APPURTENANT TO THE LAND ABOVE DESCRIBED AFFECTING THE SITE DESIGNATED (B) IN THE TITLE DIAGRAM
- 5 AJ897833 LEASE TO CONTEMPORARY HOTELS, BEACH HOUSES & VILLAS PTY LTD OF SHOP 3, 1112 BARRENJOEY ROAD, PALM BEACH. EXPIRES: 17/9/2017. OPTION OF RENEWAL: 3 YEARS.
- 6 AK233618 LEASE TO WAYNE LESLIE MAGRIN & KIERAN JOHN DOLLY OF SHOP 1, 1112 BARRENJOEY ROAD, PALM BEACH. EXPIRES: 31/10/2018. OPTION OF RENEWAL: 3 YEARS.
- 7 AK233619 LEASE TO RIVERSIDE MARINE NSW PTY LTD OF SHOP 2, 1112 BARRENJOEY ROAD, PALM BEACH. EXPIRES: 21/11/2018. OPTION OF RENEWAL: 3 YEARS.
- * 8 AR165412 CAVEAT BY PALMDEV PTY LTD

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

Palm beach 1112-1116 Barrenjoey Road PRINTED ON 1/7/2021

* Any entries preceded by an asterisk do not appear on the current edition of the Certificate of Title. Warning: the information appearing under notations has not been formally recorded in the Register. InfoTrack an approved NSW Information Broker hereby certifies that the information contained in this document has been provided electronically by the Registrar General in accordance with Section 96B(2) of the Real Property Act 1900.

Appendix F - SafeWork NSW



Our Ref: D21/105497

1 July 2021

Liangshi Chen
EI Australia

Lance.chen@eiaustralia.com.au

Dear Liangshi,

RE SITE: 1112-1116 Barrenjoey Rd, PALM BEACH, NSW, 2108

I refer to your site search request received by SafeWork NSW requesting information on Storage of Hazardous Chemicals for the above site.

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

For further information or if you have any questions, please call us on 13 10 50 or email licensing@safework.nsw.gov.au

Yours sincerely

May Neill

Licensing Representative, Licensing and Funds
Licensing and Funds | Better Regulation Division
Department of Customer Service
p 13 10 50
www.customerservice.nsw.gov.au
Level 3, 32 Mann Street, Gosford NSW 2250

Appendix G - Borehole Logs



BOREHOLE: EBH101

Project Detailed Site Investigation
 Location 1112-1116 Barrenjoey Road, Palm Beach NSW
 Position Refer to Figure 2
 Job No. E25203
 Client Palmdev Pty Ltd

Contractor
 Drill Rig Hand Auger
 Inclination -90°

Sheet 1 OF 1
 Date Started 18/6/21
 Date Completed 18/6/21
 Logged LY Date:
 Checked Date:

Drilling				Sampling			Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
HA	-	GWNE	0 0.40	EBH101_0.1-0.2 ES PID = 0.1 ppm	█	⊗	-	FILL: Silty sand, fine to medium grained, brown, with rootlets, brick, sandstone and gravels, no odour.	D	-	FILL	
			1					Hole Terminated at 0.40 m Refusal on solid objects				
			2									
			3									
			4									
			5									
			6									
			7									
			8									
			9									
			10									

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



BOREHOLE: EBH102

Project Detailed Site Investigation
 Location 1112-1116 Barrenjoey Road, Palm Beach NSW
 Position Refer to Figure 2
 Job No. E25203
 Client Palmdev Pty Ltd

Contractor
 Drill Rig Hand Auger
 Inclination -90°

Sheet 1 OF 1
 Date Started 18/6/21
 Date Completed 18/6/21
 Logged LY Date:
 Checked Date:

Drilling				Sampling			Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
HA	-	GWNE	0 0.50	EBH102_0.1-0.2 ES PID = 0.5 ppm	■	⊗	-	FILL: Silty sand, fine to medium grained, brown, with rootlets, brick, sandstone and gravels, no odour.	D	-		FILL
			1					Hole Terminated at 0.50 m Refusal on solid objects				
			2									
			3									
			4									
			5									
			6									
			7									
			8									
			9									
			10									

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



BOREHOLE: EBH103

Project Detailed Site Investigation
 Location 1112-1116 Barrenjoey Road, Palm Beach NSW
 Position Refer to Figure 2
 Job No. E25203
 Client Palmdev Pty Ltd

Contractor
 Drill Rig Hand Auger
 Inclination -90°

Sheet 1 OF 1
 Date Started 18/6/21
 Date Completed 18/6/21
 Logged LY Date:
 Checked Date:

Drilling				Sampling			Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
HA	-	GWNE	0	EBH103_0.1-0.2 ES	█	⊗	-	FILL: Silty sand, fine to medium grained, brown, with brick, sandstone, scrap metal and fibro-cement piece, no odour.	D	-	FILL	
			0.30	PID = 0.2 ppm				Hole Terminated at 0.30 m Refusal on solid objects				
			1									
			2									
			3									
			4									
			5									
			6									
			7									
			8									
			9									
			10									

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



BOREHOLE: EBH104

Project: Detailed Site Investigation
 Location: 1112-1116 Barrenjoey Road, Palm Beach NSW
 Position: Refer to Figure 2
 Job No.: E25203
 Client: Palmdev Pty Ltd

Contractor:
 Drill Rig: Hand Auger
 Inclination: -90°

Sheet: 1 OF 1
 Date Started: 18/6/21
 Date Completed: 18/6/21
 Logged LY: Date:
 Checked: Date:

Drilling				Sampling			Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
HA	-	GWNE	0 0.50	EBH104_0.1-0.2 ES PID = 0.2 ppm	■	D	-	Topsoil: Silty sand, medium to coarse grained, dark grey, with rootlets, brick, tile and sandstone fragments, no odour.	M	-		TOPSOIL
			1					Hole Terminated at 0.50 m Refusal on solid objects				
			2									
			3									
			4									
			5									
			6									
			7									
			8									
			9									
			10									

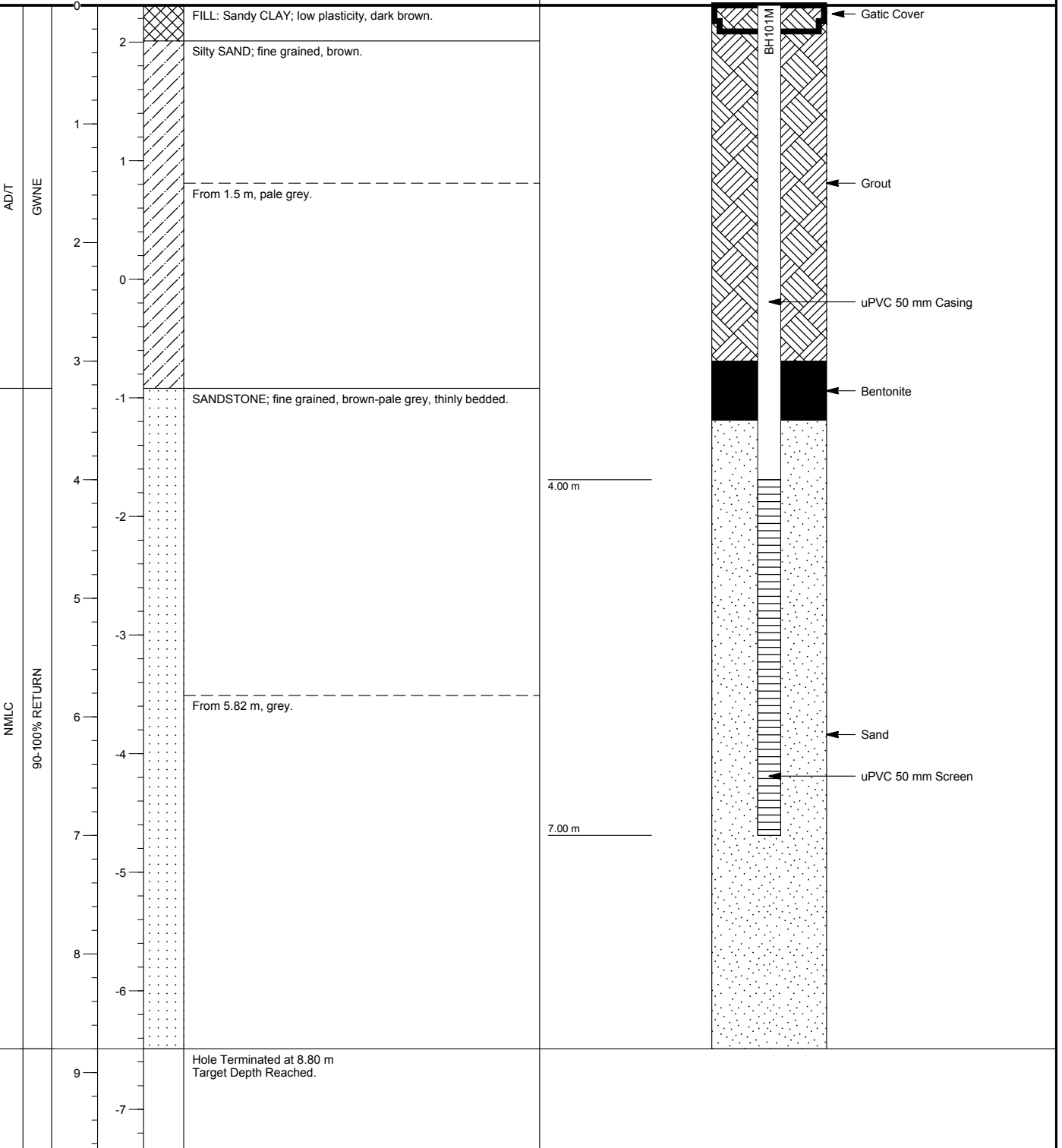
This borehole log should be read in conjunction with EI Australia's accompanying standard notes.

Project	Proposed Development	Sheet	1 of 2
Location	1112-1116 Barrenjoey Road, Palm Beach NSW	Date Started	11/06/2021
Position	Refer to Figure 2	Date Completed	11/06/2021
Job No.	E25203.G03	Logged By	KX
Client	Palmdev Pty Ltd	Date	11/06/2021
		Reviewed By	SR
		Date	14/07/2021

Drilling Contactor	BG Drilling	Surface RL	≈2.31 m AHD
Drill Rig	CE180	Inclination	-90°

PIEZOMETER CONSTRUCTION DETAILS

ID	Type	Stick Up & RL	Tip Depth & RL	Installation Date	Static Water Level
BH101M	Standpipe		7.00 m -4.69 m		



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

Project	Proposed Development	Sheet	1 of 1
Location	1112-1116 Barrenjoey Road, Palm Beach NSW	Date Started	11/06/2021
Position	Refer to Figure 2	Date Completed	11/06/2021
Job No.	E25203.G03	Logged By	KX Date 11/06/2021
Client	Palmdev Pty Ltd	Reviewed By	SR Date 14/07/2021

Drilling Contactor	BG Drilling	Surface RL	≈2.50 m AHD
Drill Rig	CE180	Inclination	-90°

Drilling			Sampling	Field Material Description						
METHOD	PENETRATION RESISTANCE	WATER	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	REL. DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
DEPTH (metres)	DEPTH RL									
DT						CONCRETE; 130 mm thick.	-	-		PAVEMENT FILL
						FILL: Silty SAND; fine grained, dark brown.	M	-		
			BH102_0.50-0.95 SPT 0.50-0.95 m 4,3,3 N=6		SM	Silty SAND; fine grained, brown.				RESIDUAL SOIL
			BH102_1.50-1.95 SPT 1.50-1.95 m 2,2,2 N=4				M			
			BH102_3.00-3.45 SPT 3.00-3.45 m 5,9,10 N=19		CH	Silty CLAY; high plasticity, pale grey.				
			BH102_4.50-4.95 SPT 4.50-4.95 m 8,7,10 N=17			From 4.5 m, pale grey to red-brown.				
			BH102_6.00-6.40 SPT 6.00-6.40 m 2,10,20/100mm HB			From 6.0 m, pale grey.	M (<PL)			VSt
						Hole Terminated at 9.87 m T/C Bit Refusal.				

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

Appendix H - Field Data Sheets

WATER SAMPLING FIELD SHEET



Site Address: 112-116 Warrenjoey Road, Palm Beach	Job Number: E25203
Client: Palmdew	Date: 18/6/21
Field Staff: LY	Sampling Location ID: BH101M
Well Location:	Round No: 1
MEDIUM <input checked="" type="checkbox"/> Groundwater <input type="checkbox"/> Surface Water <input type="checkbox"/> Stormwater <input type="checkbox"/> Other:	

SAMPLING POINT INFO	
Well Installation Date: 11/6/21	Stick up / down (m): -0.00 (+ above ground - below ground)
Initial Well Depth (mBTOC): 7.0	Screen Interval (mBTOC): 4.0-7.0
Previous Sampling Date:	Previous SWL (mBTOC):

PID READINGS	
PID Headspace (ppm):	PID Background (ppm):
PID Breathing Space (ppm):	

PRE PURGE	
Total Well Depth (mBTOC): 7.0	Well Head Condition: Good
SWL (mBTOC): 1.0	Water Column (m): 6.0

PHASE SEPARATED HYDROCARBONS (PSH)	
Depth to PSH (mBTOC): /	PSH Visually Confirmed (Bailer): /
PSH Thickness (mm): /	

PURGE AND SAMPLE	
Sampling Method <input checked="" type="checkbox"/> Bladder <input type="checkbox"/> Peristaltic <input type="checkbox"/> Submersible <input type="checkbox"/> Other:	
Depth of Pump Inlet (mBTOC): 3.5	Fill Timer: 5
Pump Pressure Regulator (psi): 25	Discharge Timer: 10
Weather Conditions: Fine	Cycle: 0.1mL
Pump on time: 10:20	Pump off time: 10:30

WATER QUALITY PARAMETERS	
Probe Make and Model:	Bump Test Date and Time:

Time	Volume (L)	SWL (mbtoc)	Temp (°C)	EC (µS/cm)	Redox (mV)	DO (mg/L)	pH (units)	Comments (colour, turbidity, odour, sheen etc.)
10:05	0.5	1.0	19.15	202	20.5	1.54	7.19	clear, low turbidity,
10:06			19.15	205	20.6	1.55	7.20	
10:07	1.0	1.4	19.15	204	20.7	1.56	7.20	no odour, no sheen.
10:08			19.15	205	20.9	1.56	7.20	
10:09	1.5	1.8	19.14	206	21.2	1.58	7.21	
Stabilisation range: 3 consecutive readings			±0.2°C	±3%	±20mV	±10%	±0.2	

OTHER COMMENTS/OBSERVATIONS:

SIGNATURE:

Appendix I - Chain of Custody and Sample
Receipt Forms

Sheet <u>1</u> of <u>2</u>					Sample Matrix			Analysis														Comments		
Site: 1112-1116 Barrajooy Road, Palm Beach			Project No: E25202		WATER	SOIL	OTHER	HM ^A /TRH/BTEX/PAHS OCP/OP/PCB/Asbestos	HM ^A /TRH/BTEX/PAHS	HM ^A /TRH/BTEX	BTEX	VOCs	Asbestos	Asbestos Quantification	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	Dewatering Suite	sPOCAs	PFAS	Sulphates	Chlorides	pH & EC #	TCLP HM A / PAH	HM ^A Arsenic Cadmium Chromium Copper Lead Mercury Nickel Zinc
Sample ID	Laboratory ID	Container Type	Sampling																					HM ^B Arsenic Cadmium Chromium Lead Mercury Nickel
Laboratory:					SGS Australia Unit 16, 33 Maddox Street, ALEXANDRIA NSW 2015 P: 02 8594 0400 F: 02 8594 0499																			
					WATER SOIL OTHER HM ^A /TRH/BTEX/PAHS OCP/OP/PCB/Asbestos HM ^A /TRH/BTEX/PAHS HM ^A /TRH/BTEX BTEX VOCs Asbestos Asbestos Quantification pH / CEC (cation exchange) pH / EC (electrical conductivity) Dewatering Suite sPOCAs PFAS Sulphates Chlorides pH & EC # TCLP HM A / PAH																			
BH101M-0.1-02	1	J, ZLB	11/26/21			X	X																	
BH101M-0.6-08	2	J, ZLB						X														X		
BH101M-1.6-18	3	ZLB																				X		
BH102-0.15-025	4	J, ZLB					X																	
BH102-0.5-1.0	5	↓						X														X		
BH102-1.8-20	6	ZLB																				X		
BH102-3.0-32	7	↓																				X		
BH102-4.0-42	8	↓																				X		
BH102-5.0-62	9	↓																				X		
BH102-6.0-82	10	↓																				X		
BH071	11	S.P.VC							X															
BH07B1		↓																						

SGS EHS Sydney COC
SE220686



LABORATORY TURNAROUND

Standard

24 Hours

48 Hours

72 Hours

Other _____

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

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

Report with EI Waste Classification Table


Sampler's Name (EI): Print Kaiyu Xu	Received by (SGS): Print George Zhi
Signature <i>[Signature]</i>	Signature <i>[Signature]</i>
Date 15/6/21	Date 15/6/21 @ 2:45pm

Sampler's Comments:
 for pH & EC results
 24hr TAT
 please send the Report to Emmanuel
 and Lance Chen

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



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

Sheet <u>2</u> of <u>2</u>		Sample Matrix		Analysis																Comments							
Site: 1112-1116 Borrenjoey Road Palm Beach		Project No: E1523		WATER	SOIL	OTHER	HM ^A /TRH/BTEX/PAHs	OCP/OP/PCB/Asbestos	HM ^A /TRH/BTEX/PAHs	HM ^A /TRH/BTEX	BTEX	VOCs	Asbestos	Asbestos Quantification	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	Dewatering Suite	sPOCAS	PFAS	Sulphates	Chlorides	TCLP HM A / PAH	HM ^A Arsenic Cadmium Chromium Copper Lead Mercury Nickel Zinc				
Laboratory: SGS Australia Unit 16, 33 Maddox Street, ALEXANDRIA NSW 2015 P: 02 8594 0400 F: 02 8594 0499		Container Type	Sampling																				HM ^B Arsenic Cadmium Chromium Lead Mercury Nickel				
Sample ID	Laboratory ID		Date																					Time	HM ^B Arsenic Cadmium Chromium Lead Mercury Nickel		
TB	12	Lab prepared		X																	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						
T3	13	Lab prepared		X																		LABORATORY TURNAROUND					
																						<input checked="" type="checkbox"/> Standard					
																						<input type="checkbox"/> 24 Hours					
																						<input type="checkbox"/> 48 Hours					
																						<input type="checkbox"/> 72 Hours					
																						<input type="checkbox"/> Other _____					
Container Type: J = solvent washed, acid rinsed, Teflon sealed glass jar S = solvent washed, acid rinsed glass bottle P = natural HDPE plastic bottle VC = glass vial, Teflon Septum ZLB = Zip-Lock Bag				Investigator: I attest that these samples were collected in accordance with standard EI field sampling procedures.																Report with EI Waste Classification Table <input type="checkbox"/>							
 Suite 6.01, 55 Miller Street, PYRMONT NSW 2009 Ph: 9516 0722 lab@eiaustralia.com.au COC March 2018 FORM v.4 - SGS				Sampler's Name (EI): Print: Kaiyin Xu Signature: [Signature] Date: 15/6/21				Received by (SGS): Print: George Zhi Signature: [Signature] Date: 15/6/21 @ 2:45pm				Sampler's Comments: As last page															
				IMPORTANT: Please e-mail laboratory results to: lab@eiaustralia.com.au																							



SAMPLE RECEIPT ADVICE

SE220686

CLIENT DETAILS

Contact Kaiyu Xu
Client EI AUSTRALIA
Address SUITE 6.01
55 MILLER STREET
PYRMONT NSW 2009

Telephone 61 2 9516 0722
Facsimile (Not specified)
Email kaiyu.xu@eiaustralia.com.au

Project **E25203 1112-1116 Barrenjoey Road, Palm B**
Order Number **E25203**
Samples 13

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 Tue 15/6/2021
Report Due Tue 22/6/2021
SGS Reference **SE220686**

SUBMISSION DETAILS

This is to confirm that 13 samples were received on Tuesday 15/6/2021. Results are expected to be ready by COB Tuesday 22/6/2021. Please quote SGS reference SE220686 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	6 Soil, 1 Water
Date documentation received	15/6/2021	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	18°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

pHf&pHfox reported in SE220686A.
1 water sample has been placed on hold as no tests have been assigned for it. This sample will not be processed.

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CLIENT DETAILS

Client **EI AUSTRALIA**

Project **E25203 1112-1116 Barrenjoey Road, Palm B**

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	BH101M_0.1-0.2	29	14	26	11	7	10	11	7
002	BH101M_0.6-0.8	-	-	26	-	7	10	11	7
004	BH102_0.15-0.25	29	14	26	11	7	10	11	7
005	BH102_0.8-1.0	-	-	26	-	7	10	11	7
012	TB	-	-	-	-	-	-	11	-
013	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.

CLIENT DETAILS

Client **EI AUSTRALIA**

Project **E25203 1112-1116 Barrenjoey Road, Palm B**

SUMMARY OF ANALYSIS

No.	Sample ID	Fibre Identification in soil	Mercury in Soil	Moisture Content	VOCs in Water
001	BH101M_0.1-0.2	2	1	1	-
002	BH101M_0.6-0.8	-	1	1	-
004	BH102_0.15-0.25	2	1	1	-
005	BH102_0.8-1.0	-	1	1	-
011	BHQP-1	-	-	-	11
012	TB	-	-	1	-

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.

CLIENT DETAILS

Client **EI AUSTRALIA**

Project **E25203 1112-1116 Barrenjoey Road, Palm B**

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
011	BHQP-1	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.

Site: 1112-1116 Banyang Road, Palm Beach
 Project No: EHS202

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	Time
BH101A-01-02	1	J, ZLB	11/05/21	
BH101A-06-08	2	J, ZLB		
BH101A-16-18	3	ZLB		
BH102-015-025	4	J, ZLB		
BH102-05-10	5	↓		
BH102-18-20	6	ZLB		
BH102-30-32	7	↓		
BH102-40-42	8	↓		
BH102-50-52	9	↓		
BH102-60-62	10	↓		
BHQR1	11	S, P, VC		
BHQR31		↓		

Sample Matrix	Analysis																	
	WATER	SOIL	OTHER	HM ^A /TRH/BTEX/PAHs OCP/OP/PCB/Asbestos	HM ^A /TRH/BTEX/PAHs	HM ^A /TRH/BTEX	BTEX	VOCs	Asbestos	Asbestos Quantification	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	Dewatering Suite	sPOCAS	PFAS	Sulphates	Chlorides	TCLP HM A / PAH
		X		X	X													X
																		X
																		X
																		X
																		X
																		X
																		X
																		X
																		X

SGS EHS Alexandria Laboratory
SE220686A COC
 Received: 15 - Jun - 2021

HM ^A	<input checked="" type="checkbox"/>
Arsenic	<input type="checkbox"/>
Cadmium	<input type="checkbox"/>
Chromium	<input type="checkbox"/>
Copper	<input type="checkbox"/>
Lead	<input type="checkbox"/>
Mercury	<input type="checkbox"/>
Nickel	<input type="checkbox"/>
Zinc	<input type="checkbox"/>
HM ^B	<input type="checkbox"/>
Arsenic	<input type="checkbox"/>
Cadmium	<input type="checkbox"/>
Chromium	<input type="checkbox"/>
Copper	<input type="checkbox"/>
Lead	<input type="checkbox"/>
Mercury	<input type="checkbox"/>
Nickel	<input type="checkbox"/>
Dewatering St	<input type="checkbox"/>
pH & EC	<input type="checkbox"/>
TDS / TDU	<input type="checkbox"/>
Hardness	<input type="checkbox"/>
Total Cyanide	<input type="checkbox"/>
Metals (Al, As, Cu, Pb, Hg, Ni, TRH (F1, F2, F3)	<input type="checkbox"/>
BTEX	<input type="checkbox"/>
PAH	<input type="checkbox"/>
LABORATORY TURNAROUND	<input checked="" type="checkbox"/> Stan
	<input type="checkbox"/> 24 H
	<input type="checkbox"/> 48 H
	<input type="checkbox"/> 72 H
	<input type="checkbox"/> Other

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



eiaustralia
 Contamination | Remediation | Reconstruction

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

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

Sampler's Name (EI):	Keiyn Xu	Received by (SGS):	Seoche Zhi
Print	<i>Keiyn Xu</i>	Print	<i>Seoche Zhi</i>
Signature	<i>Keiyn Xu</i>	Signature	<i>Seoche Zhi</i>
Date	15/6/21	Date	15/6/21 @ 2:45pm

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

Report with EI Waste Classification Table

Sampler's Comments:
 for pH & sPOC results
 24 hr TAT
 please send the report to Brian and Lance Chen



SAMPLE RECEIPT ADVICE

SE220686A

CLIENT DETAILS

Contact Kaiyu Xu
Client EI AUSTRALIA
Address SUITE 6.01
55 MILLER STREET
PYRMONT NSW 2009

Telephone 61 2 9516 0722
Facsimile (Not specified)
Email kaiyu.xu@eiaustralia.com.au

Project **E25203 1112-6 Barrenjoey Rd Palm Beach**
Order Number **E25203**
Samples 13

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 Tue 15/6/2021
Report Due Wed 16/6/2021
SGS Reference **SE220686A**

SUBMISSION DETAILS

This is to confirm that 13 samples were received on Tuesday 15/6/2021. Results are expected to be ready by COB Wednesday 16/6/2021. Please quote SGS reference SE220686A 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	8 Soil
Date documentation received	15/6/2021	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	18°C	Sufficient sample for analysis	Yes
Turnaround time requested	Next Day		

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

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CLIENT DETAILS

Client **EI AUSTRALIA**

Project **E25203 1112-6 Barrenjoey Rd Palm Beach**

SUMMARY OF ANALYSIS

No.	Sample ID	Field pH for Acid Sulphate Soil
002	BH101M_0.6-0.8	4
003	BH101M_1.6-1.8	4
005	BH102_0.8-1.0	4
006	BH102_1.8-2.0	4
007	BH102_3.0-3.2	4
008	BH102_4.0-4.2	4
009	BH102_5.0-6.2	4
010	BH102_6.0-6.2	4

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 .

Yin, Emily (Sydney)

From: Emmanuel Woelders - EIAustralia <emmanuel.woelders@eiaustralia.com.au>
Sent: Wednesday, 16 June 2021 10:26 AM
To: AU.SampleReceipt.Sydney (Sydney)
Cc: Crawford, Huong (Sydney); Harley, Paul (Sydney)
Subject: [EXTERNAL] FW: Report Job SE220686A, your reference E25203 1112-6 Barrenjoey Rd Palm Beach, order number E25203

Attachments: SE220686A_F_KX_EW_LC_ANALYTICALREPORT2.PDF;
 SE220686A_F_KX_EW_LC_DQO.PDF; SE220686A_COC.PDF;
 SE220686A_RECEIPT.PDF; SE220686A_F_SGS_SAMP.XLSX; ESDAT_SE220686A_F.ZIP

*** WARNING: this message is from an EXTERNAL SENDER. Please be cautious, particularly with links and attachments. ***

Sample receipt,

Please test for SPOCAS on samples BH101M_0.6-0.8, BH101M_1.6-1.8, BH102_3.0-3.2, BH102_4.0-4.2 & BH102_5.0-6.2 on a standard TAT.

Regards,

Emmanuel Woelders
 BEnvSc, MEnvSc – Environmental Science
Senior Environmental Scientist
Project Manager

T 02 9516 0722 M 0475 554 312
 E emmanuel.woelders@eiaustralia.com.au

Suite 6.01, 55 Miller Street
 Pyrmont, NSW 2009

www.eiaustralia.com.au



Environmental | Geotechnical | Structural | Civil | Hazardous Materials

EI Australia is a proud member of the Australian Contaminated Land Consultants Association and the Australian Geomechanics Society.

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SGS EHS Alexandria Laboratory



SE220686B COC
 Received: 16 – Jun – 2021

From: AU.Environmental.Sydney@SGS.com [mailto:AU.Environmental.Sydney@SGS.c...]
Sent: Wednesday, 16 June 2021 10:03 AM
To: Emmanuel Woelders - EIAustralia; Kaiyu Xu - EIAustralia; Laboratory Results - EIAustralia; Lance Chen - EIAustralia
Subject: Report Job SE220686A, your reference E25203 1112-6 Barrenjoey Rd Palm Beach, order number E25203

Dear Kaiyu,

Please find attached the report for SGS job SE220686A, your reference E25203 1112-6 Barrenjoey Rd Palm Beach, order number E25203.

CLIENT DETAILS

Contact Kaiyu Xu
 Client EI AUSTRALIA
 Address SUITE 6.01
 55 MILLER STREET
 PYRMONT NSW 2009

Telephone 61 2 9516 0722
 Facsimile (Not specified)
 Email kaiyu.xu@eiaustralia.com.au

Project **E25203 1112-6 Barrenjoey Rd Palm Beach**
 Order Number **E25203**
 Samples 13

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 Wed 16/6/2021
 Report Due Wed 23/6/2021
 SGS Reference **SE220686B**

SUBMISSION DETAILS

This is to confirm that 13 samples were received on Wednesday 16/6/2021. Results are expected to be ready by COB Wednesday 23/6/2021. Please quote SGS reference SE220686B 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	5 Soil
Date documentation received	16/6/2021@10:26AM	Type of documentation received	Email
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	18°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

SPOCAS subcontracted to SGS Cairns, 2/58 Comport St, Portsmith QLD 4870, NATA Accreditation Number: 2562, Site Number: 3146.

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CLIENT DETAILS

Client **EI AUSTRALIA**

Project **E25203 1112-6 Barrenjoey Rd Palm Beach**


SUMMARY OF ANALYSIS

No.	Sample ID	Moisture Content	SPOCAS Net Acidity Calculations	TAA (Titratable Actual Acidity)	TPA (Titratable Peroxide Acidity)
002	BH101M_0.6-0.8	1	6	7	21
003	BH101M_1.6-1.8	1	6	7	21
007	BH102_3.0-3.2	1	6	7	21
008	BH102_4.0-4.2	1	6	7	21
009	BH102_5.0-6.2	1	6	7	21

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 <u>1</u> of <u>1</u>				Sample Matrix			Analysis												Comments					
Site: 1112-1116 Barrenjoey Road, Palm Beach			Project No: E25203	WATER	SOIL	OTHER	HM ^A /TRH/BTEX/PAHs OC/PO/PCB/Asbestos	HM ^A /TRH/BTEX/PAHs	HM ^A /TRH/BTEX	BTEX	VOCs	Asbestos	Asbestos Quantification	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	Dewatering Suite	sPOCAS	PFAS	Sulphates	Chlorides	Forward to EnviroLab	TCLP HM ^A / PAH	HM ^A Arsenic Cadmium Chromium Copper Lead Mercury Nickel Zinc	
Laboratory: SGS Australia Unit 16, 33 Maddox Street, ALEXANDRIA NSW 2015 P: 02 8594 0400 F: 02 8594 0499		Laboratory ID	Container Type																				Sampling Date Time	
Sample ID	Laboratory ID	Container Type	Date	Time	WATER	SOIL	OTHER	HM ^A /TRH/BTEX/PAHs OC/PO/PCB/Asbestos	HM ^A /TRH/BTEX/PAHs	HM ^A /TRH/BTEX	BTEX	VOCs	Asbestos	Asbestos Quantification	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	Dewatering Suite	sPOCAS	PFAS	Sulphates	Chlorides	Forward to EnviroLab	TCLP HM ^A / PAH	Comments
EBH101_0.1-0.2	1	J,ZLB	18/6/21			X		X																HM ^A Arsenic Cadmium Chromium Copper Lead Mercury Nickel Zinc
EBH102_0.1-0.2	2	↓				↓		↓																Dewatering Suite pH & EC TDS / TDU Hardness Total Cyanide Metals (Al, As, Cc, Cr, Cu, Pb, Hg, Ni, Zn) TRH (F1, F2, F3, F4) BTEX PAH
EBH103_0.1-0.2	3	↓				↓		↓																
EBH104_0.1-0.2	4	↓				↓		↓																
QD1	5	J				↓				X														
QTI		J				↓																X		LABORATORY TURNAROUND
BH101M	6	S, PX2, VCX2			X			X				X												<input checked="" type="checkbox"/> Standard
GWQD1	7	↓				↓				X														<input type="checkbox"/> 24 Hours
GWQTI		↓				↓																X		<input type="checkbox"/> 48 Hours
QR1	8	S, VCX2				↓				X														<input type="checkbox"/> 72 Hours
QTB1	9	VC				X					X													<input type="checkbox"/> Other
QTS1	10	VC				X					X													

SGS EHS Sydney COC
SE220848



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


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

Sampler's Name (EI): Print <u>Lon Ye</u> Signature <u>[Signature]</u> Date <u>18/6/21</u>	Received by (SGS): Print <u>George Zhi</u> Signature <u>[Signature]</u> Date <u>18/6/21 @ 2:20pm</u>
--	---

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

Report with EI Waste Classification Table

Sampler's Comments:
 * Please forward QTI and GWQTI to EnviroLab.
 * Please filter plastic bottle for HMs test.



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

COC March 2018 FORM v 4 - SGS



SAMPLE RECEIPT ADVICE

SE220848

CLIENT DETAILS

Contact Lan Ye
Client EI AUSTRALIA
Address SUITE 6.01
55 MILLER STREET
PYRMONT NSW 2009

Telephone 61 2 95160722
Facsimile (Not specified)
Email Lan.ye@eiaustralia.com.au

Project **E25203 1112-1116 Barrenjoey Road, Palm B**
Order Number **E25203**
Samples 10

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 Fri 18/6/2021
Report Due Fri 25/6/2021
SGS Reference **SE220848**

SUBMISSION DETAILS

This is to confirm that 10 samples were received on Friday 18/6/2021. Results are expected to be ready by COB Friday 25/6/2021. Please quote SGS reference SE220848 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	None
Samples received in correct containers	Yes	Sample counts by matrix	7 Soil, 3 Water
Date documentation received	18/6/2021	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	19°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

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CLIENT DETAILS

Client **EI AUSTRALIA**

Project **E25203 1112-1116 Barrenjoey Road, Palm B**

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	EBH101_0.1-0.2	29	14	26	11	7	10	11	7
002	EBH102_0.1-0.2	29	14	26	11	7	10	11	7
003	EBH103_0.1-0.2	29	14	26	11	7	10	11	7
004	EBH104_0.1-0.2	29	14	26	11	7	10	11	7
005	QD1	-	-	-	-	7	10	11	7
009	QTB1	-	-	-	-	-	-	11	-
010	QTS1	-	-	-	-	-	-	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.

CLIENT DETAILS

Client **EI AUSTRALIA**

Project **E25203 1112-1116 Barrenjoey Road, Palm B**

SUMMARY OF ANALYSIS

No.	Sample ID	Fibre Identification in soil	Mercury in Soil	Moisture Content	VOCs in Water
001	EBH101_0.1-0.2	2	1	1	-
002	EBH102_0.1-0.2	2	1	1	-
003	EBH103_0.1-0.2	2	1	1	-
004	EBH104_0.1-0.2	2	1	1	-
005	QD1	-	1	1	-
006	BH101M	-	-	-	78
007	GWQD1	-	-	-	11
008	QR1	-	-	-	11
009	QTB1	-	-	1	-

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.

CLIENT DETAILS

Client **EI AUSTRALIA**

Project **E25203 1112-1116 Barrenjoey Road, Palm B**

SUMMARY OF ANALYSIS

No.	Sample ID	Mercury (dissolved) in Water	PAH (Polynuclear Aromatic Hydrocarbons) in Water	Trace Metals (Dissolved) in Water by ICPMS	TRH (Total Recoverable Hydrocarbons) in Water	Volatile Petroleum Hydrocarbons in Water
006	BH101M	1	22	7	9	7
007	GWQD1	1	-	7	9	7
008	QR1	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.

Hi GBS team,

Please book in as below- Emily is away today. Thanks.

Kind Regards,

Huong Crawford
Industries & Environment
Production Manager

SGS Australia Pty Ltd
Unit 16, 33 Maddox Street
Alexandria NSW 2015
Phone: +61 (0)2 8594 0403
Fax: + 61 (0)2 8594 0499
E-mail: Huong.Crawford@sgs.com
Web: www.au.sgs.com

View Your Results Online: engage.sgs.com

From: Emmanuel Woelders - EIAustralia <emmanuel.woelders@eiaustralia.com.au>
Sent: Monday, 28 June 2021 10:50 AM
To: AU.SampleReceipt.Sydney (Sydney) <AU.SampleReceipt.Sydney@sgs.com>
Cc: Crawford, Huong (Sydney) <Huong.Crawford@sgs.com>; Harley, Paul (Sydney) <Paul.Harley@sgs.com>; Lan Ye - EIAustralia <lan.ye@eiaustralia.com.au>
Subject: [EXTERNAL] FW: Report Job SE220848, your reference E25203 1112-1116 Barrenjoey Road, Palm B, order number E25203

***** WARNING: this message is from an EXTERNAL SENDER. Please be cautious, particularly with links and attachments. *****

Sample receipt,

Please test for Silica Gel Clean Up TRH and heavy metals (lab filtered) on sample BH101M on a 3 day TAT.

Regards,

Emmanuel Woelders
BEnvSc, MEnvSc – Environmental Science
Senior Environmental Scientist
Project Manager
T 02 9516 0722 **M** 0475 554 312
E emmanuel.woelders@eiaustralia.com.au

Suite 6.01, 55 Miller Street
Pymont, NSW 2009



www.eiaustralia.com.au

Environmental | Geotechnical | Structural | Civil | Hazardous Materials



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From: AU.Samplerreceipt.Sydney@SGS.com [<mailto:AU.Samplerreceipt.Sydney@SGS.com>]

Sent: Friday, 25 June 2021 3:32 PM

To: Laboratory Results - EIAustralia; Lan Ye - EIAustralia

Subject: Report Job SE220848, your reference E25203 1112-1116 Barrenjoey Road, Palm B, order number E25203

Dear Valued Customer,

Please find attached the report for SGS job SE220848, your reference E25203 1112-1116 Barrenjoey Road, Palm B, order number E25203.

How are we doing? Please take a quick online [Survey](#)

If you have any questions or concerns, please don't hesitate to contact your SGS Client Services representative.

Best Regards,
SGS Alexandria Customer Service Team
SGS Australia Pty Ltd
Phone: +61 (0)2 8594 0400

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SAMPLE RECEIPT ADVICE

SE220848A

CLIENT DETAILS

Contact Lan Ye
Client EI AUSTRALIA
Address SUITE 6.01
55 MILLER STREET
PYRMONT NSW 2009

Telephone 61 2 95160722
Facsimile (Not specified)
Email Lan.ye@eiaustralia.com.au

Project **E25203 1112-1116 Barrenjoey Road, Palm B**
Order Number **E25203**
Samples 10

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 28/6/2021
Report Due Thu 1/7/2021
SGS Reference **SE220848A**

SUBMISSION DETAILS

This is to confirm that 10 samples were received on Monday 28/6/2021. Results are expected to be ready by COB Thursday 1/7/2021. Please quote SGS reference SE220848A 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	None
Samples received in correct containers	Yes	Sample counts by matrix	1 Water
Date documentation received	28/6/2021@10:50am	Type of documentation received	Email
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	19°C	Sufficient sample for analysis	Yes
Turnaround time requested	Three Days		

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

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CLIENT DETAILS

Client **EI AUSTRALIA**


Project **E25203 1112-1116 Barrenjoey Road, Palm B**

SUMMARY OF ANALYSIS

No.	Sample ID	Mercury (dissolved) in Water	Trace Metals (Dissolved) in Water by ICPMS	TRH Silica Gel (Total Recoverable)
006	BH101M	1	7	9

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 <u>1</u> of <u>1</u>					Sample Matrix								Analysis										Comments			
Site: 112-116 Barrenjoey Road, Palm Beach			Project No: E25203		SOIL	WATER	0.45 µm filtered	OTHER	HM ^A / TRH/BTEX/PAHS OC/OP/PCB/Asbestos	HM ^A / TRH/BTEX/PAHS	HM ^A / TRH/BTEX	BTEX	VOCs	Asbestos	Asbestos Quantification	Excavated Natural Material (ENM) Suite	Dewatering Suite	pH / pH peroxide	sPOCAS	Chromium Reducible Sulfur (CrS)	PFAS	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	Sulphate / Chloride	TCLP HM ^B / PAH	HM ^A Arsenic Cadmium Chromium Copper Lead Mercury Nickel Zinc
Laboratory: Envirolab Services 12 Ashley Street, CHATSWOOD NSW 2067 P: 02 9910 6200	Sample ID	Laboratory ID	Container Type	Sampling Date																						Time
	QTI	1	J	18/6/21		X				X															Dewatering Suite pH & EC TDS / TOU Hardness Total Cyanide Metals (Al, As, Cd, Cr, Cu, Pb, Hg, Ni, Zn) TRH (F1, F2, F3, F4) BTEX PAH	
	GWQTI	2	S.PX2VC2	18/6/21		X				X															LABORATORY TURNAROUND <input checked="" type="checkbox"/> Standard <input type="checkbox"/> 24 Hours <input type="checkbox"/> 48 Hours <input type="checkbox"/> 72 Hours <input type="checkbox"/> Other	



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

Job No: 272102

Date Received: 21/6/21
Time Received: 13:55
Received By: [Signature]
Temp: Cool / Ambient
Occurrence: [Signature]
Security: Lock / Unlocked / None

Container Type: J = solvent washed, acid rinsed, Teflon sealed glass jar S = solvent washed, acid rinsed glass bottle P = natural HDPE plastic bottle VC = glass vial, Teflon Septum ZLB = Zip-Lock Bag		Investigator: I attest that these samples were collected in accordance with standard EI field sampling procedures.		Report with EI Waste Classification Table <input type="checkbox"/>	
Suite 6.01, 55 Miller Street, PYRMONT NSW 2009 Ph: 9516 0722 lab@eiaustralia.com.au		Sampler's Name (EI): Print: <i>Lan Ye</i> Signature: <i>[Signature]</i> Date: <i>18/6/21</i>		Received by (Envirolab): Print: <i>AMULUM</i> Signature: <i>[Signature]</i> Date: <i>21/6/21 13:55</i>	
 <p>Contamination Remediation Geotechnical</p>		IMPORTANT: Please e-mail laboratory results to: lab@eiaustralia.com.au		Sampler's Comments: Please filter plastic bottle for HMs test.	

SAMPLE RECEIPT ADVICE

Client Details

Client	EI Australia
Attention	Lan Ye

Sample Login Details

Your reference	E25203, 1112-1116 Barrenjoey Road, Palm Beach
Envirolab Reference	272162
Date Sample Received	21/06/2021
Date Instructions Received	21/06/2021
Date Results Expected to be Reported	28/06/2021

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	1 soil, 1 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	14
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie

Phone: 02 9910 6200
Fax: 02 9910 6201
Email: ahie@envirolab.com.au

Jacinta Hurst

Phone: 02 9910 6200
Fax: 02 9910 6201
Email: jhurst@envirolab.com.au

Analysis Underway, details on the following page:



Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	Acid Extractable metals in soil	vTRH(C6-C10)/BTEXN in Water	svTRH (C10-C40) in Water	HM in water - dissolved
QT1	✓	✓	✓			
GWQT1				✓	✓	✓

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.

Site: 1112-1116 Banyang Road, Palm Beach
 Project No: EHS202

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	Time
BH101A-01-02	1	J, ZLB	11/05/21	
BH101A-06-08	2	J, ZLB		
BH101A-16-18	3	ZLB		
BH102-015-025	4	J, ZLB		
BH102-05-10	5	↓		
BH102-18-20	6	ZLB		
BH102-30-32	7	↓		
BH102-40-42	8	↓		
BH102-50-52	9	↓		
BH102-60-62	10	↓		
BHQR1	11	S, P, VC		
BHQR31		↓		

Sample Matrix	Analysis																	
	WATER	SOIL	OTHER	HM ^A /TRH/BTEX/PAHs OCP/OP/PCB/Asbestos	HM ^A /TRH/BTEX/PAHs	HM ^A /TRH/BTEX	BTEX	VOCs	Asbestos	Asbestos Quantification	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	Dewatering Suite	sPOCAS	PFAS	Sulphates	Chlorides	TCLP HM A / PAH
		X		X	X													X
																		X
																		X
																		X
																		X
																		X
																		X
																		X
																		X

SGS EHS Alexandria Laboratory
 SE220686A COC
 Received: 15 - Jun - 2021



HM ^A	<input checked="" type="checkbox"/>
Arsenic	<input type="checkbox"/>
Cadmium	<input type="checkbox"/>
Chromium	<input type="checkbox"/>
Copper	<input type="checkbox"/>
Lead	<input type="checkbox"/>
Mercury	<input type="checkbox"/>
Nickel	<input type="checkbox"/>
Zinc	<input type="checkbox"/>
HM ^B	<input type="checkbox"/>
Arsenic	<input type="checkbox"/>
Cadmium	<input type="checkbox"/>
Chromium	<input type="checkbox"/>
Copper	<input type="checkbox"/>
Lead	<input type="checkbox"/>
Mercury	<input type="checkbox"/>
Nickel	<input type="checkbox"/>
Dewatering St	<input type="checkbox"/>
pH & EC	<input type="checkbox"/>
TDS / TDU	<input type="checkbox"/>
Hardness	<input type="checkbox"/>
Total Cyanide	<input type="checkbox"/>
Metals (Al, As, Cu, Pb, Hg, Ni, TRH (F1, F2, F3)	<input type="checkbox"/>
BTEX	<input type="checkbox"/>
PAH	<input type="checkbox"/>
LABORATORY TURNAROUND	<input checked="" type="checkbox"/> Stan <input type="checkbox"/> 24 H <input type="checkbox"/> 48 H <input type="checkbox"/> 72 H <input type="checkbox"/> Other

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



eiaustralia
 Environmental Remediation Technology

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

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

Sampler's Name (EI): Keiyn Xu	Received by (SGS): Seagee Zhi
Print Signature	Print Signature
Date 15/6/21	Date 15/6/21 @ 2:45pm

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

Report with EI Waste Classification Table

Sampler's Comments:
 for pH & sPOC results
 24 hr TAT
 please send the report to Ben and Lance Chen



SAMPLE RECEIPT ADVICE

SE220686A

CLIENT DETAILS

Contact Kaiyu Xu
Client EI AUSTRALIA
Address SUITE 6.01
55 MILLER STREET
PYRMONT NSW 2009

Telephone 61 2 9516 0722
Facsimile (Not specified)
Email kaiyu.xu@eiaustralia.com.au

Project **E25203 1112-6 Barrenjoey Rd Palm Beach**
Order Number **E25203**
Samples 13

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 Tue 15/6/2021
Report Due Wed 16/6/2021
SGS Reference **SE220686A**

SUBMISSION DETAILS

This is to confirm that 13 samples were received on Tuesday 15/6/2021. Results are expected to be ready by COB Wednesday 16/6/2021. Please quote SGS reference SE220686A 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	8 Soil
Date documentation received	15/6/2021	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	18°C	Sufficient sample for analysis	Yes
Turnaround time requested	Next Day		

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

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CLIENT DETAILS

Client **EI AUSTRALIA**

Project **E25203 1112-6 Barrenjoey Rd Palm Beach**

SUMMARY OF ANALYSIS

No.	Sample ID	Field pH for Acid Sulphate Soil
002	BH101M_0.6-0.8	4
003	BH101M_1.6-1.8	4
005	BH102_0.8-1.0	4
006	BH102_1.8-2.0	4
007	BH102_3.0-3.2	4
008	BH102_4.0-4.2	4
009	BH102_5.0-6.2	4
010	BH102_6.0-6.2	4

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.

Yin, Emily (Sydney)

From: Emmanuel Woelders - EIAustralia <emmanuel.woelders@eiaustralia.com.au>
Sent: Wednesday, 16 June 2021 10:26 AM
To: AU.SampleReceipt.Sydney (Sydney)
Cc: Crawford, Huong (Sydney); Harley, Paul (Sydney)
Subject: [EXTERNAL] FW: Report Job SE220686A, your reference E25203 1112-6 Barrenjoey Rd Palm Beach, order number E25203

Attachments: SE220686A_F_KX_EW_LC_ANALYTICALREPORT2.PDF;
 SE220686A_F_KX_EW_LC_DQO.PDF; SE220686A_COC.PDF;
 SE220686A_RECEIPT.PDF; SE220686A_F_SGS_SAMP.XLSX; ESDAT_SE220686A_F.ZIP

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Sample receipt,

Handwritten notes: 2, 3, 7, 8, 9

Please test for SPOCAS on samples BH101M_0.6-0.8, BH101M_1.6-1.8, BH102_3.0-3.2, BH102_4.0-4.2 & BH102_5.0-6.2 on a standard TAT.

Regards,

Emmanuel Woelders
 BEnvSc, MEnvSc – Environmental Science
Senior Environmental Scientist
Project Manager

T 02 9516 0722 M 0475 554 312
 E emmanuel.woelders@eiaustralia.com.au

Suite 6.01, 55 Miller Street
 Pyrmont, NSW 2009

www.eiaustralia.com.au



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SGS EHS Alexandria Laboratory



SE220686B COC
 Received: 16 – Jun – 2021

From: AU.Environmental.Sydney@SGS.com [mailto:AU.Environmental.Sydney@SGS.c...]
Sent: Wednesday, 16 June 2021 10:03 AM
To: Emmanuel Woelders - EIAustralia; Kaiyu Xu - EIAustralia; Laboratory Results - EIAustralia; Lance Chen - EIAustralia
Subject: Report Job SE220686A, your reference E25203 1112-6 Barrenjoey Rd Palm Beach, order number E25203

Dear Kaiyu,

Please find attached the report for SGS job SE220686A, your reference E25203 1112-6 Barrenjoey Rd Palm Beach, order number E25203.

CLIENT DETAILS

Contact Kaiyu Xu
 Client EI AUSTRALIA
 Address SUITE 6.01
 55 MILLER STREET
 PYRMONT NSW 2009

Telephone 61 2 9516 0722
 Facsimile (Not specified)
 Email kaiyu.xu@eiaustralia.com.au

Project **E25203 1112-6 Barrenjoey Rd Palm Beach**
 Order Number **E25203**
 Samples 13

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 Wed 16/6/2021
 Report Due Wed 23/6/2021
 SGS Reference **SE220686B**

SUBMISSION DETAILS

This is to confirm that 13 samples were received on Wednesday 16/6/2021. Results are expected to be ready by COB Wednesday 23/6/2021. Please quote SGS reference SE220686B 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	5 Soil
Date documentation received	16/6/2021@10:26AM	Type of documentation received	Email
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	18°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

SPOCAS subcontracted to SGS Cairns, 2/58 Comport St, Portsmith QLD 4870, NATA Accreditation Number: 2562, Site Number: 3146.

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CLIENT DETAILS

Client **EI AUSTRALIA**

Project **E25203 1112-6 Barrenjoey Rd Palm Beach**

SUMMARY OF ANALYSIS

No.	Sample ID	Moisture Content	SPOCAS Net Acidity Calculations	TAA (Titratable Actual Acidity)	TPA (Titratable Peroxide Acidity)
002	BH101M_0.6-0.8	1	6	7	21
003	BH101M_1.6-1.8	1	6	7	21
007	BH102_3.0-3.2	1	6	7	21
008	BH102_4.0-4.2	1	6	7	21
009	BH102_5.0-6.2	1	6	7	21

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.

Yin, Emily (Sydney)

From: Emmanuel Woelders - EIAustralia <emmanuel.woelders@eiaustralia.com.au>
Sent: Wednesday, 23 June 2021 4:44 PM
To: AU.SampleReceipt.Sydney (Sydney)
Cc: Crawford, Huong (Sydney); Harley, Paul (Sydney)
Subject: [EXTERNAL] FW: Report Job SE220686B, your reference E25203 1112-6 Barrenjoey Rd Palm Beach, order number E25203
Attachments: SE220686B_F_KX_EW_LC_ANALYTICALREPORT2.PDF; SE220686B_F_KX_EW_LC_DQO.PDF; SE220686B_COC.PDF; SE220686B_RECEIPT.PDF; SE220686B_F_SGS_SAMP.XLSX; ESDAT_SE220686B_F.ZIP

*** WARNING: this message is from an EXTERNAL SENDER. Please be cautious, particularly with links and attachments. ***

Sample receipt,

Please test for chromium suite analysis on samples on the following samples on a 24hr TAT.

BH102⁷_3.0-3.2 BH102⁸_4.0-4.2 BH102⁹_5.0-6.2

Regards,

Emmanuel Woelders
BEnvSc, MEnvSc – Environmental Science
Senior Environmental Scientist
Project Manager

T 02 9516 0722 M 0475 554 312
E emmanuel.woelders@eiaustralia.com.au

Suite 6.01, 55 Miller Street
Pymont, NSW 2009

www.eiaustralia.com.au

SGS EHS Alexandria Laboratory



SE220686C COC
Received: 23 – Jun – 2021



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From: AU.Environmental.Sydney@SGS.com [mailto:AU.Environmental.Sydney@SGS.com]
Sent: Wednesday, 23 June 2021 4:23 PM
To: Emmanuel Woelders - EIAustralia; Kaiyu Xu - EIAustralia; Laboratory Results - EIAustralia; Lance Chen - EIAustralia
Subject: Report Job SE220686B, your reference E25203 1112-6 Barrenjoey Rd Palm Beach, order number E25203

Hi Emmanuel

CLIENT DETAILS

Contact Kaiyu Xu
 Client EI AUSTRALIA
 Address SUITE 6.01
 55 MILLER STREET
 PYRMONT NSW 2009

Telephone 61 2 9516 0722
 Facsimile (Not specified)
 Email kaiyu.xu@eiaustralia.com.au

Project **E25203 1112-6 Barrenjoey Rd Palm Beach**
 Order Number **E25203**
 Samples 13

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 Wed 23/6/2021
 Report Due Thu 24/6/2021
 SGS Reference **SE220686C**

SUBMISSION DETAILS

This is to confirm that 13 samples were received on Wednesday 23/6/2021. Results are expected to be ready by COB Thursday 24/6/2021. Please quote SGS reference SE220686C 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	3 Soil
Date documentation received	23/6/2021@4:44pm	Type of documentation received	Email
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	18°C	Sufficient sample for analysis	Yes
Turnaround time requested	Next Day		

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

Chromium Suite subcontracted to SGS Cairns, 2/58 Comport St, Portsmith QLD 4870, NATA Accreditation Number: 2562, Site Number: 3146.

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CLIENT DETAILS

Client **EI AUSTRALIA**

Project **E25203 1112-6 Barrenjoey Rd Palm Beach**

SUMMARY OF ANALYSIS

No.	Sample ID	Acid Neutralising Capacity (ANC)	Chromium Reducible Sulphur (CRS)	Chromium Suite Net Acidity Calculations	HCl Extractable S, Ca and Mg in Soil ICP OES	Moisture Content	TAA (Titratable Actual Acidity)
007	BH102_3.0-3.2	4	2	7	1	1	5
008	BH102_4.0-4.2	4	2	7	1	1	5
009	BH102_5.0-6.2	4	2	7	1	1	5

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.

Appendix J - Laboratory Analytical Reports

CLIENT DETAILS

LABORATORY DETAILS

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Project **E25203 1112-1116 Barrenjoey Road, Palm B**
 Order Number **E25203**
 Samples 13

SGS Reference **SE220686 R0**
 Date Received 15/6/2021
 Date Reported 22/6/2021

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

Akheeqaq BENIAMREEN
 Chemist

Dong LIANG
 Metals/Inorganics Team Leader

Kamrul AHSAN
 Senior Chemist

Ly Kim HA
 Organic Section Head

Ravee SIVASUBRAMANIAM
 Hygiene Team Leader

Shane MCDERMOTT
 Inorganic/Metals Chemist

VOC's in Soil [AN433] Tested: 17/6/2021

PARAMETER	UOM	LOR	BH101M_0.1-0.2	BH101M_0.6-0.8	BH102_0.15-0.25	BH102_0.8-1.0	TB
			SOIL	SOIL	SOIL	SOIL	SOIL
			11/6/2021 SE220686.001	11/6/2021 SE220686.002	11/6/2021 SE220686.004	11/6/2021 SE220686.005	11/6/2021 SE220686.012
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	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

PARAMETER	UOM	LOR	TS
			SOIL
			11/6/2021 SE220686.013
Benzene	mg/kg	0.1	[103%]
Toluene	mg/kg	0.1	[98%]
Ethylbenzene	mg/kg	0.1	[96%]
m/p-xylene	mg/kg	0.2	[96%]
o-xylene	mg/kg	0.1	[96%]
Total Xylenes	mg/kg	0.3	-
Total BTEX	mg/kg	0.6	-
Naphthalene	mg/kg	0.1	-

Volatile Petroleum Hydrocarbons in Soil [AN433] Tested: 17/6/2021

PARAMETER	UOM	LOR	BH101M_0.1-0.2	BH101M_0.6-0.8	BH102_0.15-0.25	BH102_0.8-1.0
			SOIL - 11/6/2021 SE220686.001	SOIL - 11/6/2021 SE220686.002	SOIL - 11/6/2021 SE220686.004	SOIL - 11/6/2021 SE220686.005
TRH C6-C9	mg/kg	20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25

TRH (Total Recoverable Hydrocarbons) in Soil [AN403] Tested: 17/6/2021

PARAMETER	UOM	LOR	BH101M_0.1-0.2	BH101M_0.6-0.8	BH102_0.15-0.25	BH102_0.8-1.0
			SOIL - 11/6/2021 SE220686.001	SOIL - 11/6/2021 SE220686.002	SOIL - 11/6/2021 SE220686.004	SOIL - 11/6/2021 SE220686.005
TRH C10-C14	mg/kg	20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45	<45	<45
TRH C29-C36	mg/kg	45	<45	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100
TRH >C10-C16	mg/kg	25	<25	<25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	<110	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210	<210

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420] Tested: 17/6/2021

PARAMETER	UOM	LOR	BH101M_0.1-0.2	BH101M_0.6-0.8	BH102_0.15-0.25	BH102_0.8-1.0
			SOIL	SOIL	SOIL	SOIL
			11/6/2021 SE220686.001	11/6/2021 SE220686.002	11/6/2021 SE220686.004	11/6/2021 SE220686.005
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	<0.3	<0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2	<0.2
Total PAH (18)	mg/kg	0.8	<0.8	<0.8	<0.8	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	<0.8	<0.8	<0.8	<0.8

OC Pesticides in Soil [AN420] Tested: 17/6/2021

PARAMETER	UOM	LOR	BH101M_0.1-0.2	BH102_0.15-0.25
			SOIL - 11/6/2021 SE220686.001	SOIL - 11/6/2021 SE220686.004
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	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1
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
Endrin	mg/kg	0.2	<0.2	<0.2
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	<0.1	<0.1
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

OP Pesticides in Soil [AN420] Tested: 17/6/2021

PARAMETER	UOM	LOR	BH101M_0.1-0.2	BH102_0.15-0.25
			SOIL - 11/6/2021 SE220686.001	SOIL - 11/6/2021 SE220686.004
Dichlorvos	mg/kg	0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5
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	<0.2	<0.2
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	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2
Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7

PCBs in Soil [AN420] Tested: 17/6/2021

PARAMETER	UOM	LOR	BH101M_0.1-0.2	BH102_0.15-0.25
			SOIL - 11/6/2021 SE220686.001	SOIL - 11/6/2021 SE220686.004
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	<0.2	<0.2
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

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 18/6/2021

PARAMETER	UOM	LOR	BH101M_0.1-0.2	BH101M_0.6-0.8	BH102_0.15-0.25	BH102_0.8-1.0
			SOIL - 11/6/2021 SE220686.001	SOIL - 11/6/2021 SE220686.002	SOIL - 11/6/2021 SE220686.004	SOIL - 11/6/2021 SE220686.005
Arsenic, As	mg/kg	1	3	3	3	4
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	15	9.8	12	4.3
Copper, Cu	mg/kg	0.5	1.0	2.1	4.1	1.9
Lead, Pb	mg/kg	1	7	5	10	3
Nickel, Ni	mg/kg	0.5	2.3	2.4	1.8	0.8
Zinc, Zn	mg/kg	2	12	11	17	10

Mercury in Soil [AN312] Tested: 18/6/2021

PARAMETER	UOM	LOR	BH101M_0.1-0.2	BH101M_0.6-0.8	BH102_0.15-0.25	BH102_0.8-1.0
			SOIL - 11/6/2021 SE220686.001	SOIL - 11/6/2021 SE220686.002	SOIL - 11/6/2021 SE220686.004	SOIL - 11/6/2021 SE220686.005
Mercury	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05

Moisture Content [AN002] Tested: 18/6/2021

PARAMETER	UOM	LOR	BH101M_0.1-0.2	BH101M_0.6-0.8	BH102_0.15-0.25	BH102_0.8-1.0	TB
			SOIL - 11/6/2021 SE220686.001	SOIL - 11/6/2021 SE220686.002	SOIL - 11/6/2021 SE220686.004	SOIL - 11/6/2021 SE220686.005	SOIL - 11/6/2021 SE220686.012
% Moisture	%w/w	1	11.1	9.6	9.3	8.1	<1.0

Fibre Identification in soil [AN602] Tested: 21/6/2021

PARAMETER	UOM	LOR	BH101M_0.1-0.2	BH102_0.15-0.25
			SOIL - 11/6/2021 SE220686.001	SOIL - 11/6/2021 SE220686.004
Asbestos Detected	No unit	-	No	No
Estimated Fibres*	%w/w	0.01	<0.01	<0.01

VOCs in Water [AN433] Tested: 17/6/2021

			BHQP-1
			WATER
			-
			11/6/2021
			SE220686.011
PARAMETER	UOM	LOR	
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	µg/L	0.5	<0.5

Volatile Petroleum Hydrocarbons in Water [AN433] Tested: 17/6/2021

			BHQP-1
			WATER
			-
			11/6/2021
PARAMETER	UOM	LOR	SE220686.011
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: 17/6/2021

			BHQP-1
			WATER
			-
			11/6/2021
PARAMETER	UOM	LOR	SE220686.011
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: 16/6/2021

			BHQP-1
			WATER
			-
			11/6/2021
PARAMETER	UOM	LOR	SE220686.011
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: 16/6/2021

			BHQP-1
			WATER
			-
			11/6/2021
PARAMETER	UOM	LOR	SE220686.011
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 unequivocally 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-gb/environment-health-and-safety.

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CLIENT DETAILS

LABORATORY DETAILS

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Project	E25203 1112-1116 Barrenjoey Road, Palm B	SGS Reference	SE220686 R0
Order Number	E25203	Date Received	15 Jun 2021
Samples	13	Date Reported	22 Jun 2021

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	Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES	4 items
Matrix Spike	OC Pesticides 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	6 Soil, 1 Water
Date documentation received	15/6/2021	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	18°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

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
BH101M_0.1-0.2	SE220686.001	LB227119	11 Jun 2021	15 Jun 2021	11 Jun 2022	21 Jun 2021	11 Jun 2022	22 Jun 2021
BH102_0.15-0.25	SE220686.004	LB227119	11 Jun 2021	15 Jun 2021	11 Jun 2022	21 Jun 2021	11 Jun 2022	22 Jun 2021

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
BHQP-1	SE220686.011	LB226817	11 Jun 2021	15 Jun 2021	09 Jul 2021	16 Jun 2021	09 Jul 2021	17 Jun 2021

Mercury in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101M_0.1-0.2	SE220686.001	LB227036	11 Jun 2021	15 Jun 2021	09 Jul 2021	18 Jun 2021	09 Jul 2021	21 Jun 2021
BH101M_0.6-0.8	SE220686.002	LB227036	11 Jun 2021	15 Jun 2021	09 Jul 2021	18 Jun 2021	09 Jul 2021	21 Jun 2021
BH102_0.15-0.25	SE220686.004	LB227036	11 Jun 2021	15 Jun 2021	09 Jul 2021	18 Jun 2021	09 Jul 2021	21 Jun 2021
BH102_0.8-1.0	SE220686.005	LB227036	11 Jun 2021	15 Jun 2021	09 Jul 2021	18 Jun 2021	09 Jul 2021	21 Jun 2021

Moisture Content

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101M_0.1-0.2	SE220686.001	LB227010	11 Jun 2021	15 Jun 2021	25 Jun 2021	18 Jun 2021	23 Jun 2021	21 Jun 2021
BH101M_0.6-0.8	SE220686.002	LB227010	11 Jun 2021	15 Jun 2021	25 Jun 2021	18 Jun 2021	23 Jun 2021	21 Jun 2021
BH102_0.15-0.25	SE220686.004	LB227010	11 Jun 2021	15 Jun 2021	25 Jun 2021	18 Jun 2021	23 Jun 2021	21 Jun 2021
BH102_0.8-1.0	SE220686.005	LB227010	11 Jun 2021	15 Jun 2021	25 Jun 2021	18 Jun 2021	23 Jun 2021	21 Jun 2021
TB	SE220686.012	LB227010	11 Jun 2021	15 Jun 2021	25 Jun 2021	18 Jun 2021	23 Jun 2021	21 Jun 2021

OC Pesticides in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101M_0.1-0.2	SE220686.001	LB226968	11 Jun 2021	15 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	22 Jun 2021
BH101M_0.6-0.8	SE220686.002	LB226968	11 Jun 2021	15 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	22 Jun 2021
BH102_0.15-0.25	SE220686.004	LB226968	11 Jun 2021	15 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	22 Jun 2021
BH102_0.8-1.0	SE220686.005	LB226968	11 Jun 2021	15 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	22 Jun 2021

OP Pesticides in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101M_0.1-0.2	SE220686.001	LB226968	11 Jun 2021	15 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	22 Jun 2021
BH101M_0.6-0.8	SE220686.002	LB226968	11 Jun 2021	15 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	22 Jun 2021
BH102_0.15-0.25	SE220686.004	LB226968	11 Jun 2021	15 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	22 Jun 2021
BH102_0.8-1.0	SE220686.005	LB226968	11 Jun 2021	15 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	22 Jun 2021

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
BH101M_0.1-0.2	SE220686.001	LB226968	11 Jun 2021	15 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	21 Jun 2021
BH101M_0.6-0.8	SE220686.002	LB226968	11 Jun 2021	15 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	21 Jun 2021
BH102_0.15-0.25	SE220686.004	LB226968	11 Jun 2021	15 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	21 Jun 2021
BH102_0.8-1.0	SE220686.005	LB226968	11 Jun 2021	15 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	21 Jun 2021

PCBs in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101M_0.1-0.2	SE220686.001	LB226968	11 Jun 2021	15 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	22 Jun 2021
BH101M_0.6-0.8	SE220686.002	LB226968	11 Jun 2021	15 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	22 Jun 2021
BH102_0.15-0.25	SE220686.004	LB226968	11 Jun 2021	15 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	22 Jun 2021
BH102_0.8-1.0	SE220686.005	LB226968	11 Jun 2021	15 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	22 Jun 2021

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
BH101M_0.1-0.2	SE220686.001	LB227063	11 Jun 2021	15 Jun 2021	08 Dec 2021	18 Jun 2021	08 Dec 2021	21 Jun 2021
BH101M_0.6-0.8	SE220686.002	LB227063	11 Jun 2021	15 Jun 2021	08 Dec 2021	18 Jun 2021	08 Dec 2021	21 Jun 2021
BH102_0.15-0.25	SE220686.004	LB227063	11 Jun 2021	15 Jun 2021	08 Dec 2021	18 Jun 2021	08 Dec 2021	21 Jun 2021
BH102_0.8-1.0	SE220686.005	LB227063	11 Jun 2021	15 Jun 2021	08 Dec 2021	18 Jun 2021	08 Dec 2021	21 Jun 2021

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
BHQP-1	SE220686.011	LB226813	11 Jun 2021	15 Jun 2021	08 Dec 2021	16 Jun 2021	08 Dec 2021	16 Jun 2021

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Name	Sample No.	QC Ref
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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 (continued)

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101M_0.1-0.2	SE220686.001	LB226968	11 Jun 2021	15 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	21 Jun 2021
BH101M_0.6-0.8	SE220686.002	LB226968	11 Jun 2021	15 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	21 Jun 2021
BH102_0.15-0.25	SE220686.004	LB226968	11 Jun 2021	15 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	21 Jun 2021
BH102_0.8-1.0	SE220686.005	LB226968	11 Jun 2021	15 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	21 Jun 2021

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
BHQP-1	SE220686.011	LB226914	11 Jun 2021	15 Jun 2021	18 Jun 2021	17 Jun 2021	27 Jul 2021	22 Jun 2021

VOC's in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101M_0.1-0.2	SE220686.001	LB226972	11 Jun 2021	15 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	21 Jun 2021
BH101M_0.6-0.8	SE220686.002	LB226972	11 Jun 2021	15 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	21 Jun 2021
BH102_0.15-0.25	SE220686.004	LB226972	11 Jun 2021	15 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	21 Jun 2021
BH102_0.8-1.0	SE220686.005	LB226972	11 Jun 2021	15 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	21 Jun 2021
TB	SE220686.012	LB226972	11 Jun 2021	15 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	21 Jun 2021
TS	SE220686.013	LB226972	11 Jun 2021	15 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	21 Jun 2021

VOCs in Water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BHQP-1	SE220686.011	LB226964	11 Jun 2021	15 Jun 2021	18 Jun 2021	17 Jun 2021	27 Jul 2021	21 Jun 2021

Volatile Petroleum Hydrocarbons in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101M_0.1-0.2	SE220686.001	LB226972	11 Jun 2021	15 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	21 Jun 2021
BH101M_0.6-0.8	SE220686.002	LB226972	11 Jun 2021	15 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	21 Jun 2021
BH102_0.15-0.25	SE220686.004	LB226972	11 Jun 2021	15 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	21 Jun 2021
BH102_0.8-1.0	SE220686.005	LB226972	11 Jun 2021	15 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	21 Jun 2021
TB	SE220686.012	LB226972	11 Jun 2021	15 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	21 Jun 2021
TS	SE220686.013	LB226972	11 Jun 2021	15 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	21 Jun 2021

Volatile Petroleum Hydrocarbons in Water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BHQP-1	SE220686.011	LB226964	11 Jun 2021	15 Jun 2021	18 Jun 2021	17 Jun 2021	27 Jul 2021	21 Jun 2021

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 identifier 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)	BH101M_0.1-0.2	SE220686.001	%	60 - 130%	90
	BH102_0.15-0.25	SE220686.004	%	60 - 130%	101

OP Pesticides in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	BH101M_0.1-0.2	SE220686.001	%	60 - 130%	91
	BH102_0.15-0.25	SE220686.004	%	60 - 130%	94
d14-p-terphenyl (Surrogate)	BH101M_0.1-0.2	SE220686.001	%	60 - 130%	96
	BH102_0.15-0.25	SE220686.004	%	60 - 130%	97

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	BH101M_0.1-0.2	SE220686.001	%	70 - 130%	91
	BH101M_0.6-0.8	SE220686.002	%	70 - 130%	93
	BH102_0.15-0.25	SE220686.004	%	70 - 130%	94
	BH102_0.8-1.0	SE220686.005	%	70 - 130%	93
d14-p-terphenyl (Surrogate)	BH101M_0.1-0.2	SE220686.001	%	70 - 130%	96
	BH101M_0.6-0.8	SE220686.002	%	70 - 130%	96
	BH102_0.15-0.25	SE220686.004	%	70 - 130%	97
	BH102_0.8-1.0	SE220686.005	%	70 - 130%	95
d5-nitrobenzene (Surrogate)	BH101M_0.1-0.2	SE220686.001	%	70 - 130%	98
	BH101M_0.6-0.8	SE220686.002	%	70 - 130%	108
	BH102_0.15-0.25	SE220686.004	%	70 - 130%	105
	BH102_0.8-1.0	SE220686.005	%	70 - 130%	100

PCBs in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	BH101M_0.1-0.2	SE220686.001	%	60 - 130%	90
	BH102_0.15-0.25	SE220686.004	%	60 - 130%	101

VOC's in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH101M_0.1-0.2	SE220686.001	%	60 - 130%	98
	BH101M_0.6-0.8	SE220686.002	%	60 - 130%	100
	BH102_0.15-0.25	SE220686.004	%	60 - 130%	101
	BH102_0.8-1.0	SE220686.005	%	60 - 130%	99
	TB	SE220686.012	%	60 - 130%	105
d4-1,2-dichloroethane (Surrogate)	TS	SE220686.013	%	60 - 130%	95
	BH101M_0.1-0.2	SE220686.001	%	60 - 130%	106
	BH101M_0.6-0.8	SE220686.002	%	60 - 130%	107
	BH102_0.15-0.25	SE220686.004	%	60 - 130%	110
	BH102_0.8-1.0	SE220686.005	%	60 - 130%	107
d8-toluene (Surrogate)	TB	SE220686.012	%	60 - 130%	114
	TS	SE220686.013	%	60 - 130%	104
	BH101M_0.1-0.2	SE220686.001	%	60 - 130%	104
	BH101M_0.6-0.8	SE220686.002	%	60 - 130%	104
	BH102_0.15-0.25	SE220686.004	%	60 - 130%	108
	BH102_0.8-1.0	SE220686.005	%	60 - 130%	104
	TB	SE220686.012	%	60 - 130%	112
	TS	SE220686.013	%	60 - 130%	101

VOCs in Water

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BHQP-1	SE220686.011	%	40 - 130%	101
d4-1,2-dichloroethane (Surrogate)	BHQP-1	SE220686.011	%	40 - 130%	116
d8-toluene (Surrogate)	BHQP-1	SE220686.011	%	40 - 130%	103

Volatile Petroleum Hydrocarbons in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH101M_0.1-0.2	SE220686.001	%	60 - 130%	98
	BH101M_0.6-0.8	SE220686.002	%	60 - 130%	100
	BH102_0.15-0.25	SE220686.004	%	60 - 130%	101
	BH102_0.8-1.0	SE220686.005	%	60 - 130%	99

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 identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Volatile Petroleum Hydrocarbons in Soil (continued)

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
d4-1,2-dichloroethane (Surrogate)	BH101M_0.1-0.2	SE220686.001	%	60 - 130%	106
	BH101M_0.6-0.8	SE220686.002	%	60 - 130%	107
	BH102_0.15-0.25	SE220686.004	%	60 - 130%	110
	BH102_0.8-1.0	SE220686.005	%	60 - 130%	107
d8-toluene (Surrogate)	BH101M_0.1-0.2	SE220686.001	%	60 - 130%	104
	BH101M_0.6-0.8	SE220686.002	%	60 - 130%	104
	BH102_0.15-0.25	SE220686.004	%	60 - 130%	108
	BH102_0.8-1.0	SE220686.005	%	60 - 130%	104

Volatile Petroleum Hydrocarbons in Water

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BHQP-1	SE220686.011	%	40 - 130%	101
d4-1,2-dichloroethane (Surrogate)	BHQP-1	SE220686.011	%	60 - 130%	116
d8-toluene (Surrogate)	BHQP-1	SE220686.011	%	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
LB226817.001	Mercury	mg/L	0.0001	<0.0001

Mercury in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB227036.001	Mercury	mg/kg	0.05	<0.05

OC Pesticides in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB226968.001	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)	%	-	86

OP Pesticides in Soil

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

Sample Number	Parameter	Units	LOR	Result	
LB226968.001	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)	%	-	103
		d14-p-terphenyl (Surrogate)	%	-	104

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB226968.001	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
LB226968.001	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)	%	-
	2-fluorobiphenyl (Surrogate)	%	-	103
	d14-p-terphenyl (Surrogate)	%	-	104

PCBs in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB226968.001	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
	Surrogates	Total PCBs (Arochlors)	mg/kg	1
	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	86

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

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

Sample Number	Parameter	Units	LOR	Result
LB227063.001	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
LB226813.001	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
LB226968.001	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
LB226914.001	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
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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	
LB226972.001	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	mg/kg	0.1	<0.1
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	112
		d8-toluene (Surrogate)	%	-	110
		Bromofluorobenzene (Surrogate)	%	-	104
	Totals	Total BTEX	mg/kg	0.6	<0.6

VOCs in Water

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

Sample Number	Parameter	Units	LOR	Result	
LB226964.001	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	µg/L	0.5	<0.5
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	111
		d8-toluene (Surrogate)	%	-	102
		Bromofluorobenzene (Surrogate)	%	-	105

Volatile Petroleum Hydrocarbons in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB226972.001	TRH C6-C9	mg/kg	20	<20
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-

Volatile Petroleum Hydrocarbons in Water

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

Sample Number	Parameter	Units	LOR	Result	
LB226964.001	TRH C6-C9	µg/L	40	<40	
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	100
		d8-toluene (Surrogate)	%	-	101
		Bromofluorobenzene (Surrogate)	%	-	99

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

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: $MAD = 100 \times SDL / Mean + LR$

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 identifier 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 %
SE220691.006	LB226817.012	Mercury	µg/L	0.0001	<0.0001	<0.0001	200	197

Mercury in Soil

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE220686.005	LB227036.014	Mercury	mg/kg	0.05	<0.05	<0.05	200	0

Moisture Content

Method: ME-(AU)-[ENV]AN022

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE220685.004	LB227010.011	% Moisture	%w/w	1	5.2	5.3	49	2
SE220719.001	LB227010.022	% Moisture	%w/w	1	20.0	16.9	35	17
SE220719.004	LB227010.024	% Moisture	%w/w	1	15.6	18.4	36	17

OC Pesticides in Soil

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE220685.004	LB226968.014	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
		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		
SE220719.004	LB226968.023	Surrogates	mg/kg	-	0.15	0.14	30	4
		Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	0.1	<0.1	<0.1	200	0
		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		

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

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: $MAD = 100 \times SDL / Mean + LR$

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 identifier 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)-ENVJAN420

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE220719.004	LB226968.023	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
Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.15	0.15	30	0	

OP Pesticides in Soil

Method: ME-(AU)-ENVJAN420

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %	
SE220685.004	LB226968.014	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	
		Methodathion	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	1
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	2
SE220719.004	LB226968.023	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	
		Methodathion	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	2
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	2

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-ENVJAN420

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE220685.004	LB226968.014	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	<0.1	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

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

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: $MAD = 100 \times SDL / Mean + LR$

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 identifier 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)-ENVJAN420

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %	
SE220685.004	LB226968.014	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	0
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	1
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	2
		SE220719.004	LB226968.023	Naphthalene	mg/kg	0.1	<0.1	<0.1	200
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	0.3	0.1	83	76	
Anthracene	mg/kg			0.1	<0.1	<0.1	200	0	
Fluoranthene	mg/kg			0.1	0.5	0.3	55	53	
Pyrene	mg/kg			0.1	0.5	0.3	56	47	
Benzo(a)anthracene	mg/kg			0.1	0.2	0.1	87	33	
Chrysene	mg/kg			0.1	0.2	0.2	83	38	
Benzo(b&j)fluoranthene	mg/kg			0.1	0.3	0.2	76	34	
Benzo(k)fluoranthene	mg/kg			0.1	0.1	<0.1	137	34	
Benzo(a)pyrene	mg/kg			0.1	0.2	0.2	79	31	
Indeno(1,2,3-cd)pyrene	mg/kg			0.1	0.1	<0.1	117	32	
Dibenzo(ah)anthracene	mg/kg			0.1	<0.1	<0.1	200	0	
Benzo(ghi)perylene	mg/kg			0.1	0.1	<0.1	131	12	
Carcinogenic PAHs, BaP TEQ <LOR=0	mg/kg			0.2	0.3	0.2	86	36	
Carcinogenic PAHs, BaP TEQ <LOR=LOR	mg/kg			0.3	0.4	0.3	91	23	
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	mg/kg			0.2	0.4	0.3	73	28	
Total PAH (18)	mg/kg	0.8	2.6	1.5	70	54			
Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	30	5		
	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	2		
	d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	2		

PCBs in Soil

Method: ME-(AU)-ENVJAN420

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %	
SE220685.004	LB226968.014	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	4
		SE220719.004	LB226968.023	Arochlor 1016	mg/kg	0.2	<0.2	<0.2	200
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	

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

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: $MAD = 100 \times SDL / Mean + LR$

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 identifier 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

PCBs in Soil (continued)

Method: ME-(AU)-[ENV]JAN420

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE220719.004	LB226968.023	Surrogates Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0	0	30	0

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

Method: ME-(AU)-[ENV]JAN40/AN320

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE220686.005	LB227063.024	Arsenic, As	mg/kg	1	4	4	56	0
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.5	4.3	8.7	38	67 @
		Copper, Cu	mg/kg	0.5	1.9	5.1	44	90 @
		Nickel, Ni	mg/kg	0.5	0.8	1.2	80	49
		Lead, Pb	mg/kg	1	3	4	58	53
		Zinc, Zn	mg/kg	2	10	17	45	49 @
SE220767.007	LB227063.014	Chromium, Cr	mg/kg	0.5	28	27	32	3
		Lead, Pb	mg/kg	1	130	140	31	9
		Zinc, Zn	mg/kg	2	870	610	30	35 @

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]JAN403

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %	
SE220685.004	LB226968.014	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]JAN403

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %	
SE220691.006	LB226914.028	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]JAN433

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %	
SE220685.004	LB226972.014	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	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.6	11.0	50	4
		d8-toluene (Surrogate)	mg/kg	-	10.3	10.8	50	5	
		Bromofluorobenzene (Surrogate)	mg/kg	-	9.9	10.2	50	3	
		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			
SE220719.004	LB226972.025	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	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.4	10.7	50	3
		d8-toluene (Surrogate)	mg/kg	-	10.2	10.6	50	3	
		Bromofluorobenzene (Surrogate)	mg/kg	-	9.6	9.9	50	4	
		Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	200	0

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

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: $MAD = 100 \times SDL / Mean + LR$

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 identifier 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)-IENVJAN433

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE220719.004	LB226972.025	Totals Total BTEX	mg/kg	0.6	<0.6	<0.6	200	0

VOCs in Water

Method: ME-(AU)-IENVJAN433

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE220736.002	LB226964.027	Monocyclic Benzene	µg/L	0.5	2.7	2.4	50	14
		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	µg/L	0.5	<0.5	<0.5	200	0
		Surrogates d4-1,2-dichloroethane (Surrogate)	µg/L	-	12.6	9.5	30	28
		d8-toluene (Surrogate)	µg/L	-	9.3	10.7	30	15
		Bromofluorobenzene (Surrogate)	µg/L	-	9.8	10.9	30	10
		SE220755.003	LB226964.028	Monocyclic Benzene	µg/L	0.5	<0.5	<0.5
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	µg/L			0.5	<0.5	<0.5	200	0
Surrogates d4-1,2-dichloroethane (Surrogate)	µg/L			-	11.9	10.0	30	17
d8-toluene (Surrogate)	µg/L			-	10.7	11.1	30	4
Bromofluorobenzene (Surrogate)	µg/L			-	10.5	10.4	30	1

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-IENVJAN433

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE220685.004	LB226972.014	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	-	10.6	11.0	30	4
		d8-toluene (Surrogate)	mg/kg	-	10.3	10.8	30	5
		Bromofluorobenzene (Surrogate)	mg/kg	-	9.9	10.2	30	3
		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
SE220719.004	LB226972.025	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	-	10.4	10.7	30	3
		d8-toluene (Surrogate)	mg/kg	-	10.2	10.6	30	3
		Bromofluorobenzene (Surrogate)	mg/kg	-	9.6	9.9	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)-IENVJAN433

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE220736.002	LB226964.027	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	-	12.6	9.5	30	28
		d8-toluene (Surrogate)	µg/L	-	9.3	10.7	30	15
		Bromofluorobenzene (Surrogate)	µg/L	-	9.8	10.9	30	10
		VPH F Bands Benzene (F0)	µg/L	0.5	2.7	2.4	50	14
		TRH C6-C10 minus BTEX (F1)	µg/L	50	<50	<50	200	0
SE220755.003	LB226964.028	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	-	11.9	10.0	30	17
		d8-toluene (Surrogate)	µg/L	-	10.7	11.1	30	4
		Bromofluorobenzene (Surrogate)	µg/L	-	10.5	10.4	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 %
LB227036.002	Mercury	mg/kg	0.05	0.22	0.2	70 - 130	108

OC Pesticides in Soil

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB226968.002	Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	119
	Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	94
	Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	101
	Dieldrin	mg/kg	0.2	0.2	0.2	60 - 140	103
	Endrin	mg/kg	0.2	0.2	0.2	60 - 140	125
	p,p'-DDT	mg/kg	0.1	0.2	0.2	60 - 140	121
Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.13	0.15	40 - 130	89

OP Pesticides in Soil

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %	
LB226968.002	Dichlorvos	mg/kg	0.5	1.6	2	60 - 140	78	
	Diazinon (Dimpylate)	mg/kg	0.5	2.0	2	60 - 140	100	
	Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	2.0	2	60 - 140	98	
	Ethion	mg/kg	0.2	1.7	2	60 - 140	85	
	Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	93
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	88

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %	
LB226968.002	Naphthalene	mg/kg	0.1	3.4	4	60 - 140	86	
	Acenaphthylene	mg/kg	0.1	3.6	4	60 - 140	90	
	Acenaphthene	mg/kg	0.1	3.5	4	60 - 140	88	
	Phenanthrene	mg/kg	0.1	3.5	4	60 - 140	88	
	Anthracene	mg/kg	0.1	3.5	4	60 - 140	88	
	Fluoranthene	mg/kg	0.1	3.5	4	60 - 140	88	
	Pyrene	mg/kg	0.1	3.7	4	60 - 140	92	
	Benzo(a)pyrene	mg/kg	0.1	3.7	4	60 - 140	93	
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	97
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	93
	d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	88	

PCBs in Soil

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB226968.002	Arochlor 1260	mg/kg	0.2	0.5	0.4	60 - 140	121

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 %
LB227063.002	Arsenic, As	mg/kg	1	350	318.22	80 - 120	110
	Cadmium, Cd	mg/kg	0.3	5.9	4.81	70 - 130	123
	Chromium, Cr	mg/kg	0.5	42	38.31	80 - 120	110
	Copper, Cu	mg/kg	0.5	330	290	80 - 120	115
	Nickel, Ni	mg/kg	0.5	200	187	80 - 120	108
	Lead, Pb	mg/kg	1	96	89.9	80 - 120	107
	Zinc, Zn	mg/kg	2	290	273	80 - 120	107

Trace Metals (Dissolved) in Water by ICPMS

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB226813.002	Arsenic, As	µg/L	1	21	20	80 - 120	103
	Cadmium, Cd	µg/L	0.1	21	20	80 - 120	104
	Chromium, Cr	µg/L	1	22	20	80 - 120	108
	Copper, Cu	µg/L	1	22	20	80 - 120	110
	Lead, Pb	µg/L	1	23	20	80 - 120	113
	Nickel, Ni	µg/L	1	21	20	80 - 120	106
	Zinc, Zn	µg/L	5	22	20	80 - 120	110

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]JAN403

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %	
LB226968.002	TRH C10-C14	mg/kg	20	43	40	60 - 140	108	
	TRH C15-C28	mg/kg	45	<45	40	60 - 140	105	
	TRH C29-C36	mg/kg	45	<45	40	60 - 140	100	
	TRH F Bands	TRH >C10-C16	mg/kg	25	43	40	60 - 140	108
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	105
		TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	100

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]JAN403

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %	
LB226914.002	TRH C10-C14	µg/L	50	980	1200	60 - 140	82	
	TRH C15-C28	µg/L	200	1200	1200	60 - 140	103	
	TRH C29-C36	µg/L	200	1200	1200	60 - 140	103	
	TRH F Bands	TRH >C10-C16	µg/L	60	1100	1200	60 - 140	93
		TRH >C16-C34 (F3)	µg/L	500	1300	1200	60 - 140	107
		TRH >C34-C40 (F4)	µg/L	500	620	600	60 - 140	103

VOC's in Soil

Method: ME-(AU)-[ENV]JAN433

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %	
LB226972.002	Monocyclic	Benzene	mg/kg	0.1	4.6	5	60 - 140	92
		Aromatic	Toluene	mg/kg	0.1	4.6	5	60 - 140
	Ethylbenzene		mg/kg	0.1	4.7	5	60 - 140	95
	m/p-xylene		mg/kg	0.2	9.4	10	60 - 140	94
	o-xylene		mg/kg	0.1	4.7	5	60 - 140	94
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.9	10	70 - 130	109
		d8-toluene (Surrogate)	mg/kg	-	10.5	10	70 - 130	105
		Bromofluorobenzene (Surrogate)	mg/kg	-	9.8	10	70 - 130	98

VOCs in Water

Method: ME-(AU)-[ENV]JAN433

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %	
LB226964.002	Monocyclic	Benzene	µg/L	0.5	45	45.45	60 - 140	100
		Aromatic	Toluene	µg/L	0.5	47	45.45	60 - 140
	Ethylbenzene		µg/L	0.5	42	45.45	60 - 140	93
	m/p-xylene		µg/L	1	80	90.9	60 - 140	88
	o-xylene		µg/L	0.5	44	45.45	60 - 140	97
	Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.7	10	60 - 140	107
		d8-toluene (Surrogate)	µg/L	-	10.4	10	70 - 130	104
		Bromofluorobenzene (Surrogate)	µg/L	-	9.8	10	70 - 130	98

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]JAN433

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %	
LB226972.002	TRH C6-C10	mg/kg	25	73	92.5	60 - 140	79	
	TRH C6-C9	mg/kg	20	64	80	60 - 140	80	
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.9	10	70 - 130	109
		Bromofluorobenzene (Surrogate)	mg/kg	-	9.8	10	70 - 130	98
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	45	62.5	60 - 140	71

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]JAN433

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %	
LB226964.002	TRH C6-C10	µg/L	50	920	946.63	60 - 140	97	
	TRH C6-C9	µg/L	40	800	818.71	60 - 140	97	
	Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.7	10	60 - 140	107
		d8-toluene (Surrogate)	µg/L	-	10.4	10	70 - 130	104
		Bromofluorobenzene (Surrogate)	µg/L	-	9.8	10	70 - 130	98
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	µg/L	50	660	639.67	60 - 140	104

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 identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Mercury (dissolved) in Water

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE220683.040	LB226817.004	Mercury	mg/L	0.0001	0.0020	<0.00005	0.008	98

Mercury in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE220634.001	LB227036.004	Mercury	mg/kg	0.05	0.39	0.23	0.2	77

OC Pesticides in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE220684.001	LB226968.004	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	19	15	0.2	1751
		Aldrin	mg/kg	0.1	0.2	<0.1	0.2	99
		Beta BHC	mg/kg	0.1	<0.1	<0.1	-	-
		Delta BHC	mg/kg	0.1	0.2	<0.1	0.2	122
		Heptachlor epoxide	mg/kg	0.1	0.4	0.3	-	-
		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	8.6	6.2	-	-
		Alpha Chlordane	mg/kg	0.1	1.1	0.9	-	-
		trans-Nonachlor	mg/kg	0.1	0.3	0.3	-	-
		p,p'-DDE	mg/kg	0.1	<0.1	<0.1	-	-
		Dieldrin	mg/kg	0.2	0.3	<0.2	0.2	131
		Endrin	mg/kg	0.2	0.3	<0.2	0.2	132
		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	0.3	<0.1	0.2	126
		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	30	23	-	-		
Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.14	0.17	-	96	

OP Pesticides in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE220684.001	LB226968.004	Dichlorvos	mg/kg	0.5	1.6	<0.5	2	81
		Dimethoate	mg/kg	0.5	<0.5	<0.5	-	-
		Diazinon (Dimpylate)	mg/kg	0.5	2.0	<0.5	2	101
		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	2.0	<0.2	2	99
		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	1.9	<0.2	2	91
		Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	-	-
		Total OP Pesticides*	mg/kg	1.7	7.6	<1.7	-	-
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	-
	d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.5	-	88	

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR
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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 identifier 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%
SE220684.001	LB226968.004	Naphthalene	mg/kg	0.1	3.5	<0.1	4	88
		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	3.7	<0.1	4	91
		Acenaphthene	mg/kg	0.1	3.6	<0.1	4	90
		Fluorene	mg/kg	0.1	<0.1	<0.1	-	-
		Phenanthrene	mg/kg	0.1	3.8	0.4	4	86
		Anthracene	mg/kg	0.1	3.6	0.1	4	87
		Fluoranthene	mg/kg	0.1	4.2	0.9	4	83
		Pyrene	mg/kg	0.1	4.3	0.8	4	86
		Benzo(a)anthracene	mg/kg	0.1	0.3	0.4	-	-
		Chrysene	mg/kg	0.1	0.4	0.5	-	-
		Benzo(b&j)fluoranthene	mg/kg	0.1	0.5	0.5	-	-
		Benzo(k)fluoranthene	mg/kg	0.1	0.2	0.3	-	-
		Benzo(a)pyrene	mg/kg	0.1	4.1	0.5	4	92
		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	0.2	0.2	-	-
		Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	-	-
		Benzo(ghi)perylene	mg/kg	0.1	0.2	0.2	-	-
		Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	4.3	0.6	-	-
		Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	4.4	0.7	-	-
		Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	4.3	0.7	-	-
		Total PAH (18)	mg/kg	0.8	33	4.9	-	-
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	-	99
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	-	95
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.5	-	88

PCBs in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE220684.001	LB226968.004	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	-	96

Trace Metals (Dissolved) in Water by ICPMS

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE220640.001	LB226813.004	Arsenic, As	µg/L	1	23	<1	20	115
		Cadmium, Cd	µg/L	0.1	21	<0.1	20	105
		Chromium, Cr	µg/L	1	22	<1	20	106
		Copper, Cu	µg/L	1	23	1	20	108
		Lead, Pb	µg/L	1	23	<1	20	112
		Nickel, Ni	µg/L	1	22	<1	20	105
		Zinc, Zn	µg/L	5	94	73	20	104

TRH (Total Recoverable Hydrocarbons) in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE220684.001	LB226968.004	TRH C10-C14	mg/kg	20	42	<20	40	105
		TRH C15-C28	mg/kg	45	61	<45	40	68
		TRH C29-C36	mg/kg	45	45	<45	40	113
		TRH C37-C40	mg/kg	100	<100	<100	-	-
		TRH C10-C36 Total	mg/kg	110	150	<110	-	-
		TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	-	-
	TRH F Bands	TRH >C10-C16	mg/kg	25	41	<25	40	103
		TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	37	<25	-	-
		TRH >C16-C34 (F3)	mg/kg	90	<90	<90	40	63
		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 identifier 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%	
SE220684.001	LB226972.004	Monocyclic	Benzene	mg/kg	0.1	4.2	<0.1	5	85
		Aromatic	Toluene	mg/kg	0.1	4.4	<0.1	5	88
			Ethylbenzene	mg/kg	0.1	4.6	<0.1	5	92
			m/p-xylene	mg/kg	0.2	9.1	<0.2	10	91
			o-xylene	mg/kg	0.1	4.6	<0.1	5	92
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.2	9.1	10	102
			d8-toluene (Surrogate)	mg/kg	-	9.9	9.0	10	99
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.4	8.4	10	94
		Totals	Total Xylenes	mg/kg	0.3	14	<0.3	-	-
			Total BTEX	mg/kg	0.6	27	<0.6	-	-

VOCs in Water

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%	
SE220731.001	LB226964.026	Monocyclic	Benzene	µg/L	0.5	40	<0.5	45.45	88
		Aromatic	Toluene	µg/L	0.5	44	<0.5	45.45	96
			Ethylbenzene	µg/L	0.5	42	<0.5	45.45	92
			m/p-xylene	µg/L	1	86	<1	90.9	95
			o-xylene	µg/L	0.5	42	<0.5	45.45	93
		Polycyclic	Naphthalene	µg/L	0.5	38	<0.5	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	7.9	13.4	-	79
			d8-toluene (Surrogate)	µg/L	-	8.8	10.3	-	88
			Bromofluorobenzene (Surrogate)	µg/L	-	9.2	10.4	-	92

Volatile Petroleum Hydrocarbons in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%	
SE220684.001	LB226972.004	TRH C6-C10	TRH C6-C10	mg/kg	25	65	<25	92.5	70
			TRH C6-C9	mg/kg	20	58	<20	80	73
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.2	9.1	10	102
			d8-toluene (Surrogate)	mg/kg	-	9.9	9.0	10	99
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.4	8.4	-	94
		VPH F	Benzene (F0)	mg/kg	0.1	4.2	<0.1	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	38	<25	62.5	61

Volatile Petroleum Hydrocarbons in Water

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%	
SE220731.001	LB226964.026	TRH C6-C10	TRH C6-C10	µg/L	50	780	<50	946.63	82
			TRH C6-C9	µg/L	40	700	<40	818.71	85
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	7.9	13.4	-	79
			d8-toluene (Surrogate)	µg/L	-	8.8	10.3	-	88
			Bromofluorobenzene (Surrogate)	µg/L	-	9.2	10.4	-	92
		VPH F	Benzene (F0)	µg/L	0.5		0	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	µg/L	50	520	<50	639.67	82

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

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: $MAD = 100 \times SDL / Mean + LR$

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 identifier 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.

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LABORATORY DETAILS

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Project	E25203 1112-1116 Barrenjoey Road, Palm B	SGS Reference	SE220686 R0
Order Number	E25203	Date Received	15 Jun 2021
Samples	2	Date Reported	22 Jun 2021

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

Akheeque BENIAMEEN
Chemist

Kamrul AHSAN
Senior Chemist

Ly Kim HA
Organic Section Head

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*
SE220686.001	BH101M_0.1-0.2	Soil	256g Sand, Soil, Rocks	11 Jun 2021	No Asbestos Found at RL of 0.1g/kg	<0.01
SE220686.004	BH102_0.15-0.25	Soil	275g Sand, Soil, Rocks	11 Jun 2021	No Asbestos Found at RL of 0.1g/kg Organic Fibres Detected	<0.01

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 unequivocally 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- <ul style="list-style-type: none"> (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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Project **E25203 1112-6 Barrenjoey Rd Palm Beach**
 Order Number **E25203**
 Samples 13

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SGS Reference **SE220686A R0**
 Date Received 15/6/2021
 Date Reported 16/6/2021

COMMENTS

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

SIGNATORIES



Shane MCDERMOTT
 Inorganic/Metals Chemist

Field pH for Acid Sulphate Soil [AN104] Tested: 16/6/2021

PARAMETER	UOM	LOR	BH101M_0.6-0.8	BH101M_1.6-1.8	BH102_0.8-1.0	BH102_1.8-2.0	BH102_3.0-3.2
			SOIL	SOIL	SOIL	SOIL	SOIL
			11/6/2021 SE220686A.002	11/6/2021 SE220686A.003	11/6/2021 SE220686A.005	11/6/2021 SE220686A.006	11/6/2021 SE220686A.007
pHf	pH Units	-	7.1	5.1	8.5	8.1	4.8
pHfox	pH Units	-	5.8	3.8	7.3	7.3	4.7
Reaction Rate*	No unit	-	X	X	X	X	X
pH Difference*	pH Units	-10	1.3	1.3	1.2	0.8	0.1

PARAMETER	UOM	LOR	BH102_4.0-4.2	BH102_5.0-6.2	BH102_6.0-6.2
			SOIL	SOIL	SOIL
			11/6/2021 SE220686A.008	11/6/2021 SE220686A.009	11/6/2021 SE220686A.010
pHf	pH Units	-	4.5	4.7	4.9
pHfox	pH Units	-	4.0	4.6	4.3
Reaction Rate*	No unit	-	X	X	X
pH Difference*	pH Units	-10	0.5	0.1	0.6

METHOD

METHODOLOGY SUMMARY

AN104

pHF is determined on an extract of approximately 2g of as received sample in approximately 10 mL of deionised water with pH determined after standing 30 minutes.

AN104

pHFox is determined on an extract of approximately 2g of as received sample with a few mLs of 30% hydrogen peroxide (adjusted to pH 4.5 to 5.5) with the extract reaction being rated from slight to extreme, with pH determined after reaction is complete and extract has cooled. Referenced to ASS Laboratory Methods Guidelines, method 23Af-Bf, 2004.

- 0 No Reaction
- 1 Slight Reaction
- 2 Moderate Reaction
- 3 Strong/High Reaction
- 4 Extreme/Vigorous Reaction (gas evolution and heat generation)

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-gb/environment-health-and-safety.

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Project **E25203 1112-6 Barrenjoey Rd Palm Beach**
 Order Number **E25203**
 Samples 13

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SGS Reference **SE220686A R0**
 Date Received 15 Jun 2021
 Date Reported 16 Jun 2021

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 (within the SGS Alexandria Environmental laboratory).

SAMPLE SUMMARY

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

Field pH for Acid Sulphate Soil

Method: ME-(AU)-[ENV]AN104

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101M_0.6-0.8	SE220686A.002	LB226830	11 Jun 2021	15 Jun 2021	09 Jul 2021	16 Jun 2021	09 Jul 2021	16 Jun 2021
BH101M_1.6-1.8	SE220686A.003	LB226830	11 Jun 2021	15 Jun 2021	09 Jul 2021	16 Jun 2021	09 Jul 2021	16 Jun 2021
BH102_0.8-1.0	SE220686A.005	LB226830	11 Jun 2021	15 Jun 2021	09 Jul 2021	16 Jun 2021	09 Jul 2021	16 Jun 2021
BH102_1.8-2.0	SE220686A.006	LB226830	11 Jun 2021	15 Jun 2021	09 Jul 2021	16 Jun 2021	09 Jul 2021	16 Jun 2021
BH102_3.0-3.2	SE220686A.007	LB226830	11 Jun 2021	15 Jun 2021	09 Jul 2021	16 Jun 2021	09 Jul 2021	16 Jun 2021
BH102_4.0-4.2	SE220686A.008	LB226830	11 Jun 2021	15 Jun 2021	09 Jul 2021	16 Jun 2021	09 Jul 2021	16 Jun 2021
BH102_5.0-6.2	SE220686A.009	LB226830	11 Jun 2021	15 Jun 2021	09 Jul 2021	16 Jun 2021	09 Jul 2021	16 Jun 2021
BH102_6.0-6.2	SE220686A.010	LB226830	11 Jun 2021	15 Jun 2021	09 Jul 2021	16 Jun 2021	09 Jul 2021	16 Jun 2021

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 identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No surrogates were required for this job.

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.

No method blanks were required for this job.



DUPLICATES

SE220686A R0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: $RPD = | \text{OriginalResult} - \text{ReplicateResult} | \times 100 / \text{Mean}$

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: $MAD = 100 \times \text{SDL} / \text{Mean} + \text{LR}$

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 identifier 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

Field pH for Acid Sulphate Soil

Method: ME-(AU)-[ENV]AN104

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE220686A.010	LB226830.010	pHf	pH Units	-	4.9	4.6	30	7
		pHfox	pH Units	-	4.3	4.4	30	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.

Sample Number	Parameter	Units	LOR
---------------	-----------	-------	-----

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 identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No matrix spikes were required for this job.

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

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: $MAD = 100 \times SDL / Mean + LR$

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 identifier 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.

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SGS Reference **SE220686B R0**
 Date Received 16/6/2021
 Date Reported 23/6/2021

COMMENTS

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

SPOCAS subcontracted to SGS Cairns, 2/58 Comport St, Portsmith QLD 4870, NATA Accreditation Number: 2562, Site Number: 3146- CE153344

SIGNATORIES

Moisture Content [AN002] Tested: 23/6/2021

			BH101M_0.6-0.8	BH101M_1.6-1.8	BH102_3.0-3.2	BH102_4.0-4.2	BH102_5.0-6.2
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			11/6/2021	11/6/2021	11/6/2021	11/6/2021	11/6/2021
PARAMETER	UOM	LOR	SE220686B.002	SE220686B.003	SE220686B.007	SE220686B.008	SE220686B.009
% Moisture	%w/w	0.5	18	23	39	40	35

TAA (Titratable Actual Acidity) [AN219] Tested: 23/6/2021

PARAMETER	UOM	LOR	BH101M_0.6-0.8	BH101M_1.6-1.8	BH102_3.0-3.2	BH102_4.0-4.2	BH102_5.0-6.2
			SOIL	SOIL	SOIL	SOIL	SOIL
			11/6/2021 SE220686B.002	11/6/2021 SE220686B.003	11/6/2021 SE220686B.007	11/6/2021 SE220686B.008	11/6/2021 SE220686B.009
pH KCl*	pH Units	-	6.9	5.5	4.7	4.0	4.5
Titratable Actual Acidity	kg H2SO4/T	0.25	<0.25	2.0	1.3	6.4	2.1
Titratable Actual Acidity (TAA) moles H+/tonne	moles H+/T	5	<5	40	27	130	42
Titratable Actual Acidity (TAA) S%/w	%w/w S	0.01	<0.01	0.06	0.04	0.21	0.07
Sulphur (SKCl)	%w/w	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Calcium (CaKCl)	%w/w	0.005	0.022	0.006	0.007	0.016	0.017
Magnesium (MgKCl)	%w/w	0.005	<0.005	<0.005	<0.005	<0.005	<0.005

TPA (Titratable Peroxide Acidity) [AN218] Tested: 23/6/2021

PARAMETER	UOM	LOR	BH101M_0.6-0.8	BH101M_1.6-1.8	BH102_3.0-3.2	BH102_4.0-4.2	BH102_5.0-6.2
			SOIL	SOIL	SOIL	SOIL	SOIL
			11/6/2021 SE220686B.002	11/6/2021 SE220686B.003	11/6/2021 SE220686B.007	11/6/2021 SE220686B.008	11/6/2021 SE220686B.009
Peroxide pH (pH Ox)	pH Units	-	6.3	5.0	4.6	4.5	4.5
TPA as kg H ₂ SO ₄ /tonne	kg H ₂ SO ₄ /T	0.25	<0.25	2.5	1.8	6.7	2.2
TPA as moles H ⁺ /tonne	moles H ⁺ /T	5	<5	50	37	137	45
TPA as S % WW	%w/w S	0.01	<0.01	0.08	0.06	0.22	0.07
Titratable Sulfidic Acidity as moles H ⁺ /tonne	moles H ⁺ /T	5	<5	10	10	7	<5
Titratable Sulfidic Acidity as kg H ₂ SO ₄ /tonne	kg H ₂ SO ₄ /T	0.25	<0.25	0.49	0.49	0.37	<0.25
Titratable Sulfidic Acidity as S % WW	%w/w S	0.01	<0.01	0.02	0.02	0.01	<0.01
ANCE as % CaCO ₃	% CaCO ₃	0.01	-	-	-	-	-
ANCE as moles H ⁺ /tonne	moles H ⁺ /T	5	-	-	-	-	-
ANCE as S % WW	%w/w S	0.01	-	-	-	-	-
Peroxide Oxidisable Sulphur (Spos)*	%w/w	0.005	<0.005	<0.005	0.070	0.031	0.059
Peroxide Oxidisable Sulphur as moles H ⁺ /tonne*	moles H ⁺ /T	5	<5	<5	44	19	37
Sulphur (Sp)	%w/w	0.005	0.005	<0.005	0.072	0.032	0.060
Calcium (Cap)	%w/w	0.005	0.078	<0.005	0.069	0.010	0.061
Reacted Calcium (CaA)*	%w/w	0.005	0.055	<0.005	0.062	<0.005	0.044
Reacted Calcium (CaA)*	moles H ⁺ /T	5	28	<5	31	<5	22
Magnesium (Mgp)	%w/w	0.005	0.026	0.020	0.073	0.055	0.036
Reacted Magnesium (MgA)*	%w/w	0.005	0.025	0.020	0.072	0.054	0.034
Reacted Magnesium (MgA)*	moles H ⁺ /T	5	20	16	59	44	28
Net Acid Soluble Sulphur as % w/w*	%w/w	0.005	-	-	-	0.057	-
Net Acid Soluble Sulphur as moles H ⁺ /tonne*	moles H ⁺ /T	5	-	-	-	36	-

SPOCAS Net Acidity Calculations [AN220] Tested: 23/6/2021

PARAMETER	UOM	LOR	BH101M_0.6-0.8	BH101M_1.6-1.8	BH102_3.0-3.2	BH102_4.0-4.2	BH102_5.0-6.2
			SOIL	SOIL	SOIL	SOIL	SOIL
			11/6/2021 SE220686B.002	11/6/2021 SE220686B.003	11/6/2021 SE220686B.007	11/6/2021 SE220686B.008	11/6/2021 SE220686B.009
s-Net Acidity	%w/w S	0.005	-	-	-	-	-
a-Net Acidity	moles H+/T	5	-	-	-	-	-
Liming Rate*	kg CaCO3/T	0.1	-	-	-	-	-
Verification s-Net Acidity*	%w/w S	-20	-	-	-	-	-
a-Net Acidity without ANCE*	moles H+/T	5	-	-	-	180	-
Liming Rate without ANCE*	kg CaCO3/T	0.1	-	-	-	13	-

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.
AN218	Soil samples are subjected to extreme oxidising conditions using hydrogen peroxide. Continuous application of heat and peroxide ensure all sulfide is converted to sulfuric acid. Excess peroxide is broken down by a copper catalyst prior to titration for acidity. Calcium, magnesium, and sulfur are determined by ICP-OES. Also included is a carbonate modification step which, depending on pH after the initial oxidation, gives a measure of ANC.
AN219	Dried pulped sample is extracted for 4 hours in a 1 M KCl solution. The ratio of sample to solution is 1:40. The extract is titrated for acidity. Calcium, magnesium, and sulfur are determined by ICP-AES.
AN220	SPOCAS Suite: Scheme for the calculation of net acidities and liming rates using a Fineness Factor of 1.5.

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.		

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Note that in terms of units of radioactivity:

- a. 1 Bq is equivalent to 27 pCi
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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-gb/environment-health-and-safety.

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 Date Received 16 Jun 2021
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COMMENTS

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 All Data Quality Objectives were met (within the SGS Alexandria Environmental laboratory).

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	5 Soil
Date documentation received	16/6/2021@10:26A	Type of documentation received	Email
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	18°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

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

No holding time data is available for this job.

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 identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No surrogates were required for this job.

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.

No method blanks were required for this job.

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: $RPD = | \text{OriginalResult} - \text{ReplicateResult} | \times 100 / \text{Mean}$

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: $MAD = 100 \times \text{SDL} / \text{Mean} + \text{LR}$

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 identifier 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

No duplicates were required for this job.

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.

No laboratory control standards were required for this job.

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 identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No matrix spikes were required for this job.

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

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: $MAD = 100 \times SDL / Mean + LR$

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 identifier 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.

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Project **E25203 1112-1116 Barrenjoey Road, Palm B**
 Order Number **E25203**
 Samples 10

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SGS Reference **SE220848 R0**
 Date Received 18/6/2021
 Date Reported 25/6/2021

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.

Sample #3: Chrysotile asbestos found in approx 60x40x4mm cement sheet fragment.

Sample #4: Chrysotile asbestos found in approx 10x4x2mm cement sheet fragments x2.

Asbestos analysed by Approved Identifier Yusuf Kuthpudin.

SIGNATORIES



Akheeqar BENIAMREEN
 Chemist



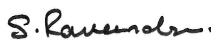
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 Senior Chemist



Ly Kim HA
 Organic Section Head



Ravee SIVASUBRAMANIAM
 Hygiene Team Leader



Shane MCDERMOTT
 Inorganic/Metals Chemist

VOC's in Soil [AN433] Tested: 21/6/2021

PARAMETER	UOM	LOR	EBH101_0.1-0.2	EBH102_0.1-0.2	EBH103_0.1-0.2	EBH104_0.1-0.2	QD1
			SOIL	SOIL	SOIL	SOIL	SOIL
			18/6/2021 SE220848.001	18/6/2021 SE220848.002	18/6/2021 SE220848.003	18/6/2021 SE220848.004	18/6/2021 SE220848.005
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	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

PARAMETER	UOM	LOR	QTB1	QTS1
			SOIL	SOIL
			18/6/2021 SE220848.009	18/6/2021 SE220848.010
Benzene	mg/kg	0.1	<0.1	[104%]
Toluene	mg/kg	0.1	<0.1	[116%]
Ethylbenzene	mg/kg	0.1	<0.1	[96%]
m/p-xylene	mg/kg	0.2	<0.2	[94%]
o-xylene	mg/kg	0.1	<0.1	[94%]
Total Xylenes	mg/kg	0.3	<0.3	-
Total BTEX	mg/kg	0.6	<0.6	-
Naphthalene	mg/kg	0.1	<0.1	-

Volatile Petroleum Hydrocarbons in Soil [AN433] Tested: 21/6/2021

PARAMETER	UOM	LOR	EBH101_0.1-0.2	EBH102_0.1-0.2	EBH103_0.1-0.2	EBH104_0.1-0.2	QD1
			SOIL	SOIL	SOIL	SOIL	SOIL
			18/6/2021 SE220848.001	18/6/2021 SE220848.002	18/6/2021 SE220848.003	18/6/2021 SE220848.004	18/6/2021 SE220848.005
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

TRH (Total Recoverable Hydrocarbons) in Soil [AN403] Tested: 21/6/2021

PARAMETER	UOM	LOR	EBH101_0.1-0.2	EBH102_0.1-0.2	EBH103_0.1-0.2	EBH104_0.1-0.2	QD1
			SOIL - 18/6/2021 SE220848.001	SOIL - 18/6/2021 SE220848.002	SOIL - 18/6/2021 SE220848.003	SOIL - 18/6/2021 SE220848.004	SOIL - 18/6/2021 SE220848.005
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

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420] Tested: 21/6/2021

PARAMETER	UOM	LOR	EBH101_0.1-0.2	EBH102_0.1-0.2	EBH103_0.1-0.2	EBH104_0.1-0.2
			SOIL	SOIL	SOIL	SOIL
			18/6/2021 SE220848.001	18/6/2021 SE220848.002	18/6/2021 SE220848.003	18/6/2021 SE220848.004
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	<0.3	<0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2	<0.2
Total PAH (18)	mg/kg	0.8	<0.8	<0.8	<0.8	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	<0.8	<0.8	<0.8	<0.8

OC Pesticides in Soil [AN420] Tested: 21/6/2021

PARAMETER	UOM	LOR	EBH101_0.1-0.2	EBH102_0.1-0.2	EBH103_0.1-0.2	EBH104_0.1-0.2
			SOIL	SOIL	SOIL	SOIL
			18/6/2021 SE220848.001	18/6/2021 SE220848.002	18/6/2021 SE220848.003	18/6/2021 SE220848.004
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	0.1
trans-Nonachlor	mg/kg	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
Dieldrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	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
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	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
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	<1	<1	<1	<1

OP Pesticides in Soil [AN420] Tested: 21/6/2021

PARAMETER	UOM	LOR	EBH101_0.1-0.2	EBH102_0.1-0.2	EBH103_0.1-0.2	EBH104_0.1-0.2
			SOIL	SOIL	SOIL	SOIL
			18/6/2021 SE220848.001	18/6/2021 SE220848.002	18/6/2021 SE220848.003	18/6/2021 SE220848.004
Dichlorvos	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	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
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	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
Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	<1.7	<1.7

PCBs in Soil [AN420] Tested: 21/6/2021

PARAMETER	UOM	LOR	EBH101_0.1-0.2	EBH102_0.1-0.2	EBH103_0.1-0.2	EBH104_0.1-0.2
			SOIL	SOIL	SOIL	SOIL
			18/6/2021 SE220848.001	18/6/2021 SE220848.002	18/6/2021 SE220848.003	18/6/2021 SE220848.004
Arochlor 1016	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1	<1	<1	<1

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 23/6/2021

PARAMETER	UOM	LOR	EBH101_0.1-0.2	EBH102_0.1-0.2	EBH103_0.1-0.2	EBH104_0.1-0.2	QD1
			SOIL - 18/6/2021 SE220848.001	SOIL - 18/6/2021 SE220848.002	SOIL - 18/6/2021 SE220848.003	SOIL - 18/6/2021 SE220848.004	SOIL - 18/6/2021 SE220848.005
Arsenic, As	mg/kg	1	2	2	4	4	4
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	11	9.6	14	9.4	9.5
Copper, Cu	mg/kg	0.5	10	3.6	8.4	31	22
Lead, Pb	mg/kg	1	23	16	23	40	30
Nickel, Ni	mg/kg	0.5	0.7	0.6	1.7	3.0	2.6
Zinc, Zn	mg/kg	2	45	38	530	150	100

Mercury in Soil [AN312] Tested: 23/6/2021

PARAMETER	UOM	LOR	EBH101_0.1-0.2	EBH102_0.1-0.2	EBH103_0.1-0.2	EBH104_0.1-0.2	QD1
			SOIL - 18/6/2021 SE220848.001	SOIL - 18/6/2021 SE220848.002	SOIL - 18/6/2021 SE220848.003	SOIL - 18/6/2021 SE220848.004	SOIL - 18/6/2021 SE220848.005
Mercury	mg/kg	0.05	<0.05	<0.05	0.06	0.15	<0.05

Moisture Content [AN002] Tested: 21/6/2021

PARAMETER	UOM	LOR	EBH101_0.1-0.2 SOIL - 18/6/2021 SE220848.001	EBH102_0.1-0.2 SOIL - 18/6/2021 SE220848.002	EBH103_0.1-0.2 SOIL - 18/6/2021 SE220848.003	EBH104_0.1-0.2 SOIL - 18/6/2021 SE220848.004	QD1 SOIL - 18/6/2021 SE220848.005
% Moisture	%w/w	1	9.7	8.8	12.4	24.5	26.3

PARAMETER	UOM	LOR	QTB1 SOIL - 18/6/2021 SE220848.009
% Moisture	%w/w	1	<1.0

Fibre Identification in soil [AN602] Tested: 23/6/2021

PARAMETER	UOM	LOR	EBH101_0.1-0.2	EBH102_0.1-0.2	EBH103_0.1-0.2	EBH104_0.1-0.2
			SOIL - 18/6/2021 SE220848.001	SOIL - 18/6/2021 SE220848.002	SOIL - 18/6/2021 SE220848.003	SOIL - 18/6/2021 SE220848.004
Asbestos Detected	No unit	-	No	No	Yes	No
Estimated Fibres*	%w/w	0.01	<0.01	<0.01	>0.01	<0.01

VOCs in Water [AN433] Tested: 24/6/2021

PARAMETER	UOM	LOR	BH101M	GWQD1	QR1
			WATER - 18/6/2021 SE220848.006	WATER - 18/6/2021 SE220848.007	WATER - 18/6/2021 SE220848.008
Benzene	µg/L	0.5	<0.5	<0.5	<0.5
Toluene	µg/L	0.5	<0.5	<0.5	<0.5
Ethylbenzene	µg/L	0.5	<0.5	<0.5	<0.5
m/p-xylene	µg/L	1	1	1	<1
o-xylene	µg/L	0.5	1.6	1.6	<0.5
Total Xylenes	µg/L	1.5	2.7	2.6	<1.5
Total BTEX	µg/L	3	<3	<3	<3
Naphthalene	µg/L	0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane (CFC-12)	µg/L	5	<5	-	-
Chloromethane	µg/L	5	<5	-	-
Vinyl chloride (Chloroethene)	µg/L	0.3	<0.3	-	-
Bromomethane	µg/L	10	<10	-	-
Chloroethane	µg/L	5	<5	-	-
Trichlorofluoromethane	µg/L	1	<1	-	-
Acetone (2-propanone)	µg/L	10	<10	-	-
Iodomethane	µg/L	5	<5	-	-
1,1-dichloroethene	µg/L	0.5	<0.5	-	-
Acrylonitrile	µg/L	0.5	<0.5	-	-
Dichloromethane (Methylene chloride)	µg/L	5	<5	-	-
Allyl chloride	µg/L	2	<2	-	-
Carbon disulfide	µg/L	2	<2	-	-
trans-1,2-dichloroethene	µg/L	0.5	<0.5	-	-
MtBE (Methyl-tert-butyl ether)	µg/L	2	<2	-	-
1,1-dichloroethane	µg/L	0.5	<0.5	-	-
Vinyl acetate	µg/L	10	<10	-	-
MEK (2-butanone)	µg/L	10	<10	-	-
cis-1,2-dichloroethene	µg/L	0.5	<0.5	-	-
Bromochloromethane	µg/L	0.5	<0.5	-	-
Chloroform (THM)	µg/L	0.5	2.5	-	-
2,2-dichloropropane	µg/L	0.5	<0.5	-	-
1,2-dichloroethane	µg/L	0.5	<0.5	-	-
1,1,1-trichloroethane	µg/L	0.5	<0.5	-	-
1,1-dichloropropene	µg/L	0.5	<0.5	-	-
Carbon tetrachloride	µg/L	0.5	<0.5	-	-
Dibromomethane	µg/L	0.5	<0.5	-	-
1,2-dichloropropane	µg/L	0.5	<0.5	-	-
Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	<0.5	-	-
2-nitropropane	µg/L	100	<100	-	-
Bromodichloromethane (THM)	µg/L	0.5	<0.5	-	-
MIBK (4-methyl-2-pentanone)	µg/L	5	<5	-	-
cis-1,3-dichloropropene	µg/L	0.5	<0.5	-	-
trans-1,3-dichloropropene	µg/L	0.5	<0.5	-	-
1,1,2-trichloroethane	µg/L	0.5	<0.5	-	-
1,3-dichloropropane	µg/L	0.5	<0.5	-	-
Dibromochloromethane (THM)	µg/L	0.5	<0.5	-	-
2-hexanone (MBK)	µg/L	5	<5	-	-
1,2-dibromoethane (EDB)	µg/L	0.5	<0.5	-	-
Tetrachloroethene (Perchloroethylene,PCE)	µg/L	0.5	<0.5	-	-
1,1,1,2-tetrachloroethane	µg/L	0.5	<0.5	-	-
Chlorobenzene	µg/L	0.5	<0.5	-	-
Bromoform (THM)	µg/L	0.5	<0.5	-	-
cis-1,4-dichloro-2-butene	µg/L	1	<1	-	-
Styrene (Vinyl benzene)	µg/L	0.5	<0.5	-	-
1,1,1,2,2-tetrachloroethane	µg/L	0.5	<0.5	-	-
1,2,3-trichloropropane	µg/L	0.5	<0.5	-	-
trans-1,4-dichloro-2-butene	µg/L	1	<1	-	-

VOCs in Water [AN433] Tested: 24/6/2021 (continued)

PARAMETER	UOM	LOR	BH101M	GWQD1	QR1
			WATER - 18/6/2021 SE220848.006	WATER - 18/6/2021 SE220848.007	WATER - 18/6/2021 SE220848.008
Isopropylbenzene (Cumene)	µg/L	0.5	<0.5	-	-
Bromobenzene	µg/L	0.5	<0.5	-	-
n-propylbenzene	µg/L	0.5	<0.5	-	-
2-chlorotoluene	µg/L	0.5	<0.5	-	-
4-chlorotoluene	µg/L	0.5	<0.5	-	-
1,3,5-trimethylbenzene	µg/L	0.5	6.7	-	-
tert-butylbenzene	µg/L	0.5	<0.5	-	-
1,2,4-trimethylbenzene	µg/L	0.5	15	-	-
sec-butylbenzene	µg/L	0.5	<0.5	-	-
1,3-dichlorobenzene	µg/L	0.5	<0.5	-	-
1,4-dichlorobenzene	µg/L	0.3	<0.3	-	-
p-isopropyltoluene	µg/L	0.5	<0.5	-	-
1,2-dichlorobenzene	µg/L	0.5	<0.5	-	-
n-butylbenzene	µg/L	0.5	<0.5	-	-
1,2-dibromo-3-chloropropane	µg/L	0.5	<0.5	-	-
1,2,4-trichlorobenzene	µg/L	0.5	<0.5	-	-
Hexachlorobutadiene	µg/L	0.5	<0.5	-	-
1,2,3-trichlorobenzene	µg/L	0.5	<0.5	-	-
Total VOC	µg/L	10	30	-	-

Volatile Petroleum Hydrocarbons in Water [AN433] Tested: 24/6/2021

PARAMETER	UOM	LOR	BH101M	GWQD1	QR1
			WATER - 18/6/2021 SE220848.006	WATER - 18/6/2021 SE220848.007	WATER - 18/6/2021 SE220848.008
TRH C6-C9	µg/L	40	<40	<40	<40
Benzene (F0)	µg/L	0.5	<0.5	<0.5	<0.5
TRH C6-C10	µg/L	50	<50	<50	<50
TRH C6-C10 minus BTEX (F1)	µg/L	50	<50	<50	<50

TRH (Total Recoverable Hydrocarbons) in Water [AN403] Tested: 21/6/2021

PARAMETER	UOM	LOR	BH101M	GWQD1	QR1
			WATER - 18/6/2021 SE220848.006	WATER - 18/6/2021 SE220848.007	WATER - 18/6/2021 SE220848.008
TRH C10-C14	µg/L	50	88	<50	<50
TRH C15-C28	µg/L	200	340	<200	<200
TRH C29-C36	µg/L	200	<200	<200	<200
TRH C37-C40	µg/L	200	<200	<200	<200
TRH >C10-C16	µg/L	60	180	<60	<60
TRH >C10-C16 - Naphthalene (F2)	µg/L	60	180	<60	<60
TRH >C16-C34 (F3)	µg/L	500	<500	<500	<500
TRH >C34-C40 (F4)	µg/L	500	<500	<500	<500
TRH C10-C40	µg/L	320	430	<320	<320

PAH (Polynuclear Aromatic Hydrocarbons) in Water [AN420] Tested: 21/6/2021

PARAMETER	UOM	LOR	BH101M
			WATER - 18/6/2021 SE220848.006
Naphthalene	µg/L	0.1	<0.1
2-methylnaphthalene	µg/L	0.1	<0.1
1-methylnaphthalene	µg/L	0.1	<0.1
Acenaphthylene	µg/L	0.1	<0.1
Acenaphthene	µg/L	0.1	<0.1
Fluorene	µg/L	0.1	<0.1
Phenanthrene	µg/L	0.1	<0.1
Anthracene	µg/L	0.1	<0.1
Fluoranthene	µg/L	0.1	<0.1
Pyrene	µg/L	0.1	<0.1
Benzo(a)anthracene	µg/L	0.1	<0.1
Chrysene	µg/L	0.1	<0.1
Benzo(b&j)fluoranthene	µg/L	0.1	<0.1
Benzo(k)fluoranthene	µg/L	0.1	<0.1
Benzo(a)pyrene	µg/L	0.1	<0.1
Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1
Dibenzo(ah)anthracene	µg/L	0.1	<0.1
Benzo(ghi)perylene	µg/L	0.1	<0.1
Total PAH (18)	µg/L	1	<1

Trace Metals (Dissolved) in Water by ICPMS [AN318] Tested: 21/6/2021

PARAMETER	UOM	LOR	BH101M	GWQD1	QR1
			WATER - 18/6/2021 SE220848.006	WATER - 18/6/2021 SE220848.007	WATER - 18/6/2021 SE220848.008
Arsenic, As	µg/L	1	<1	<1	<1
Cadmium, Cd	µg/L	0.1	0.1	0.2	<0.1
Chromium, Cr	µg/L	1	5	5	<1
Copper, Cu	µg/L	1	14	15	<1
Lead, Pb	µg/L	1	2	2	<1
Nickel, Ni	µg/L	1	470	450	<1
Zinc, Zn	µg/L	5	130	130	<5

Mercury (dissolved) in Water [AN311(Perth)/AN312] Tested: 21/6/2021

PARAMETER	UOM	LOR	BH101M	GWQD1	QR1
			WATER - 18/6/2021 SE220848.006	WATER - 18/6/2021 SE220848.007	WATER - 18/6/2021 SE220848.008
Mercury	mg/L	0.0001	<0.0001	<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 unequivocally 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-gb/environment-health-and-safety.

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STATEMENT OF QA/QC PERFORMANCE

SE220848 R0

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Order Number **E25203**
Samples 10

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SGS Reference **SE220848 R0**
Date Received 18 Jun 2021
Date Reported 25 Jun 2021

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:

Surrogate	PAH (Polynuclear Aromatic Hydrocarbons) in Water	1 item
Duplicate	Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES	2 items
Matrix Spike	Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES	2 items

SAMPLE SUMMARY

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
EBH101_0.1-0.2	SE220848.001	LB227368	18 Jun 2021	18 Jun 2021	18 Jun 2022	23 Jun 2021	18 Jun 2022	25 Jun 2021
EBH102_0.1-0.2	SE220848.002	LB227368	18 Jun 2021	18 Jun 2021	18 Jun 2022	23 Jun 2021	18 Jun 2022	25 Jun 2021
EBH103_0.1-0.2	SE220848.003	LB227368	18 Jun 2021	18 Jun 2021	18 Jun 2022	23 Jun 2021	18 Jun 2022	25 Jun 2021
EBH104_0.1-0.2	SE220848.004	LB227368	18 Jun 2021	18 Jun 2021	18 Jun 2022	23 Jun 2021	18 Jun 2022	25 Jun 2021

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
BH101M	SE220848.006	LB227098	18 Jun 2021	18 Jun 2021	16 Jul 2021	21 Jun 2021	16 Jul 2021	22 Jun 2021
GWQD1	SE220848.007	LB227098	18 Jun 2021	18 Jun 2021	16 Jul 2021	21 Jun 2021	16 Jul 2021	22 Jun 2021
QR1	SE220848.008	LB227098	18 Jun 2021	18 Jun 2021	16 Jul 2021	21 Jun 2021	16 Jul 2021	22 Jun 2021

Mercury in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
EBH101_0.1-0.2	SE220848.001	LB227375	18 Jun 2021	18 Jun 2021	16 Jul 2021	23 Jun 2021	16 Jul 2021	25 Jun 2021
EBH102_0.1-0.2	SE220848.002	LB227375	18 Jun 2021	18 Jun 2021	16 Jul 2021	23 Jun 2021	16 Jul 2021	25 Jun 2021
EBH103_0.1-0.2	SE220848.003	LB227375	18 Jun 2021	18 Jun 2021	16 Jul 2021	23 Jun 2021	16 Jul 2021	25 Jun 2021
EBH104_0.1-0.2	SE220848.004	LB227375	18 Jun 2021	18 Jun 2021	16 Jul 2021	23 Jun 2021	16 Jul 2021	25 Jun 2021
QD1	SE220848.005	LB227375	18 Jun 2021	18 Jun 2021	16 Jul 2021	23 Jun 2021	16 Jul 2021	25 Jun 2021

Moisture Content

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
EBH101_0.1-0.2	SE220848.001	LB227188	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	26 Jun 2021	23 Jun 2021
EBH102_0.1-0.2	SE220848.002	LB227188	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	26 Jun 2021	23 Jun 2021
EBH103_0.1-0.2	SE220848.003	LB227188	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	26 Jun 2021	23 Jun 2021
EBH104_0.1-0.2	SE220848.004	LB227188	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	26 Jun 2021	23 Jun 2021
QD1	SE220848.005	LB227188	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	26 Jun 2021	23 Jun 2021
QTB1	SE220848.009	LB227188	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	26 Jun 2021	23 Jun 2021

OC Pesticides in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
EBH101_0.1-0.2	SE220848.001	LB227177	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	31 Jul 2021	23 Jun 2021
EBH102_0.1-0.2	SE220848.002	LB227177	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	31 Jul 2021	23 Jun 2021
EBH103_0.1-0.2	SE220848.003	LB227177	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	31 Jul 2021	23 Jun 2021
EBH104_0.1-0.2	SE220848.004	LB227177	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	31 Jul 2021	23 Jun 2021
QD1	SE220848.005	LB227177	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	31 Jul 2021	23 Jun 2021

OP Pesticides in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
EBH101_0.1-0.2	SE220848.001	LB227177	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	31 Jul 2021	23 Jun 2021
EBH102_0.1-0.2	SE220848.002	LB227177	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	31 Jul 2021	23 Jun 2021
EBH103_0.1-0.2	SE220848.003	LB227177	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	31 Jul 2021	23 Jun 2021
EBH104_0.1-0.2	SE220848.004	LB227177	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	31 Jul 2021	23 Jun 2021
QD1	SE220848.005	LB227177	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	31 Jul 2021	23 Jun 2021

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
EBH101_0.1-0.2	SE220848.001	LB227177	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	31 Jul 2021	23 Jun 2021
EBH102_0.1-0.2	SE220848.002	LB227177	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	31 Jul 2021	23 Jun 2021
EBH103_0.1-0.2	SE220848.003	LB227177	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	31 Jul 2021	23 Jun 2021
EBH104_0.1-0.2	SE220848.004	LB227177	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	31 Jul 2021	23 Jun 2021
QD1	SE220848.005	LB227177	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	31 Jul 2021	23 Jun 2021

PAH (Polynuclear Aromatic Hydrocarbons) in Water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101M	SE220848.006	LB227088	18 Jun 2021	18 Jun 2021	25 Jun 2021	21 Jun 2021	31 Jul 2021	24 Jun 2021
GWQD1	SE220848.007	LB227088	18 Jun 2021	18 Jun 2021	25 Jun 2021	21 Jun 2021	31 Jul 2021	25 Jun 2021
QR1	SE220848.008	LB227088	18 Jun 2021	18 Jun 2021	25 Jun 2021	21 Jun 2021	31 Jul 2021	25 Jun 2021

PCBs in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
EBH101_0.1-0.2	SE220848.001	LB227177	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	31 Jul 2021	23 Jun 2021
EBH102_0.1-0.2	SE220848.002	LB227177	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	31 Jul 2021	23 Jun 2021
EBH103_0.1-0.2	SE220848.003	LB227177	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	31 Jul 2021	23 Jun 2021
EBH104_0.1-0.2	SE220848.004	LB227177	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	31 Jul 2021	23 Jun 2021

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

PCBs in Soil (continued)

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QD1	SE220848.005	LB227177	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	31 Jul 2021	23 Jun 2021

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
EBH101_0.1-0.2	SE220848.001	LB227364	18 Jun 2021	18 Jun 2021	15 Dec 2021	23 Jun 2021	15 Dec 2021	25 Jun 2021
EBH102_0.1-0.2	SE220848.002	LB227364	18 Jun 2021	18 Jun 2021	15 Dec 2021	23 Jun 2021	15 Dec 2021	25 Jun 2021
EBH103_0.1-0.2	SE220848.003	LB227364	18 Jun 2021	18 Jun 2021	15 Dec 2021	23 Jun 2021	15 Dec 2021	25 Jun 2021
EBH104_0.1-0.2	SE220848.004	LB227364	18 Jun 2021	18 Jun 2021	15 Dec 2021	23 Jun 2021	15 Dec 2021	25 Jun 2021
QD1	SE220848.005	LB227364	18 Jun 2021	18 Jun 2021	15 Dec 2021	23 Jun 2021	15 Dec 2021	25 Jun 2021

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
BH101M	SE220848.006	LB227126	18 Jun 2021	18 Jun 2021	15 Dec 2021	21 Jun 2021	15 Dec 2021	23 Jun 2021
GWQD1	SE220848.007	LB227126	18 Jun 2021	18 Jun 2021	15 Dec 2021	21 Jun 2021	15 Dec 2021	23 Jun 2021
QR1	SE220848.008	LB227126	18 Jun 2021	18 Jun 2021	15 Dec 2021	21 Jun 2021	15 Dec 2021	23 Jun 2021

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
EBH101_0.1-0.2	SE220848.001	LB227177	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	31 Jul 2021	23 Jun 2021
EBH102_0.1-0.2	SE220848.002	LB227177	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	31 Jul 2021	23 Jun 2021
EBH103_0.1-0.2	SE220848.003	LB227177	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	31 Jul 2021	23 Jun 2021
EBH104_0.1-0.2	SE220848.004	LB227177	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	31 Jul 2021	23 Jun 2021
QD1	SE220848.005	LB227177	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	31 Jul 2021	23 Jun 2021

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
BH101M	SE220848.006	LB227088	18 Jun 2021	18 Jun 2021	25 Jun 2021	21 Jun 2021	31 Jul 2021	24 Jun 2021
GWQD1	SE220848.007	LB227088	18 Jun 2021	18 Jun 2021	25 Jun 2021	21 Jun 2021	31 Jul 2021	24 Jun 2021
QR1	SE220848.008	LB227088	18 Jun 2021	18 Jun 2021	25 Jun 2021	21 Jun 2021	31 Jul 2021	24 Jun 2021

VOC's in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
EBH101_0.1-0.2	SE220848.001	LB227181	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	31 Jul 2021	23 Jun 2021
EBH102_0.1-0.2	SE220848.002	LB227181	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	31 Jul 2021	23 Jun 2021
EBH103_0.1-0.2	SE220848.003	LB227181	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	31 Jul 2021	23 Jun 2021
EBH104_0.1-0.2	SE220848.004	LB227181	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	31 Jul 2021	23 Jun 2021
QD1	SE220848.005	LB227181	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	31 Jul 2021	23 Jun 2021
QTB1	SE220848.009	LB227181	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	31 Jul 2021	23 Jun 2021
QTS1	SE220848.010	LB227181	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	31 Jul 2021	23 Jun 2021

VOCs in Water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101M	SE220848.006	LB227471	18 Jun 2021	18 Jun 2021	25 Jun 2021	24 Jun 2021	03 Aug 2021	25 Jun 2021
GWQD1	SE220848.007	LB227471	18 Jun 2021	18 Jun 2021	25 Jun 2021	24 Jun 2021	03 Aug 2021	25 Jun 2021
QR1	SE220848.008	LB227471	18 Jun 2021	18 Jun 2021	25 Jun 2021	24 Jun 2021	03 Aug 2021	25 Jun 2021

Volatile Petroleum Hydrocarbons in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
EBH101_0.1-0.2	SE220848.001	LB227181	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	31 Jul 2021	23 Jun 2021
EBH102_0.1-0.2	SE220848.002	LB227181	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	31 Jul 2021	23 Jun 2021
EBH103_0.1-0.2	SE220848.003	LB227181	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	31 Jul 2021	23 Jun 2021
EBH104_0.1-0.2	SE220848.004	LB227181	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	31 Jul 2021	23 Jun 2021
QD1	SE220848.005	LB227181	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	31 Jul 2021	23 Jun 2021
QTB1	SE220848.009	LB227181	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	31 Jul 2021	23 Jun 2021
QTS1	SE220848.010	LB227181	18 Jun 2021	18 Jun 2021	02 Jul 2021	21 Jun 2021	31 Jul 2021	23 Jun 2021

Volatile Petroleum Hydrocarbons in Water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101M	SE220848.006	LB227471	18 Jun 2021	18 Jun 2021	25 Jun 2021	24 Jun 2021	03 Aug 2021	25 Jun 2021
GWQD1	SE220848.007	LB227471	18 Jun 2021	18 Jun 2021	25 Jun 2021	24 Jun 2021	03 Aug 2021	25 Jun 2021
QR1	SE220848.008	LB227471	18 Jun 2021	18 Jun 2021	25 Jun 2021	24 Jun 2021	03 Aug 2021	25 Jun 2021

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 identifier 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)	EBH101_0.1-0.2	SE220848.001	%	60 - 130%	92
	EBH102_0.1-0.2	SE220848.002	%	60 - 130%	93
	EBH103_0.1-0.2	SE220848.003	%	60 - 130%	94
	EBH104_0.1-0.2	SE220848.004	%	60 - 130%	103

OP Pesticides in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	EBH101_0.1-0.2	SE220848.001	%	60 - 130%	90
	EBH102_0.1-0.2	SE220848.002	%	60 - 130%	84
	EBH103_0.1-0.2	SE220848.003	%	60 - 130%	90
	EBH104_0.1-0.2	SE220848.004	%	60 - 130%	96
d14-p-terphenyl (Surrogate)	EBH101_0.1-0.2	SE220848.001	%	60 - 130%	90
	EBH102_0.1-0.2	SE220848.002	%	60 - 130%	86
	EBH103_0.1-0.2	SE220848.003	%	60 - 130%	90
	EBH104_0.1-0.2	SE220848.004	%	60 - 130%	96

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	EBH101_0.1-0.2	SE220848.001	%	70 - 130%	90
	EBH102_0.1-0.2	SE220848.002	%	70 - 130%	84
	EBH103_0.1-0.2	SE220848.003	%	70 - 130%	90
	EBH104_0.1-0.2	SE220848.004	%	70 - 130%	96
d14-p-terphenyl (Surrogate)	EBH101_0.1-0.2	SE220848.001	%	70 - 130%	90
	EBH102_0.1-0.2	SE220848.002	%	70 - 130%	86
	EBH103_0.1-0.2	SE220848.003	%	70 - 130%	90
	EBH104_0.1-0.2	SE220848.004	%	70 - 130%	96
d5-nitrobenzene (Surrogate)	EBH101_0.1-0.2	SE220848.001	%	70 - 130%	96
	EBH102_0.1-0.2	SE220848.002	%	70 - 130%	100
	EBH103_0.1-0.2	SE220848.003	%	70 - 130%	106
	EBH104_0.1-0.2	SE220848.004	%	70 - 130%	116

PAH (Polynuclear Aromatic Hydrocarbons) in Water

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	BH101M	SE220848.006	%	40 - 130%	40
d14-p-terphenyl (Surrogate)	BH101M	SE220848.006	%	40 - 130%	52
d5-nitrobenzene (Surrogate)	BH101M	SE220848.006	%	40 - 130%	30 ⊖

PCBs in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	EBH101_0.1-0.2	SE220848.001	%	60 - 130%	92
	EBH102_0.1-0.2	SE220848.002	%	60 - 130%	93
	EBH103_0.1-0.2	SE220848.003	%	60 - 130%	94
	EBH104_0.1-0.2	SE220848.004	%	60 - 130%	103

VOC's in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	EBH101_0.1-0.2	SE220848.001	%	60 - 130%	85
	EBH102_0.1-0.2	SE220848.002	%	60 - 130%	82
	EBH103_0.1-0.2	SE220848.003	%	60 - 130%	76
	EBH104_0.1-0.2	SE220848.004	%	60 - 130%	80
	QD1	SE220848.005	%	60 - 130%	78
	QTB1	SE220848.009	%	60 - 130%	89
	QTS1	SE220848.010	%	60 - 130%	78
d4-1,2-dichloroethane (Surrogate)	EBH101_0.1-0.2	SE220848.001	%	60 - 130%	90
	EBH102_0.1-0.2	SE220848.002	%	60 - 130%	90
	EBH103_0.1-0.2	SE220848.003	%	60 - 130%	86
	EBH104_0.1-0.2	SE220848.004	%	60 - 130%	83
	QD1	SE220848.005	%	60 - 130%	87
	QTB1	SE220848.009	%	60 - 130%	95
	QTS1	SE220848.010	%	60 - 130%	84
d8-toluene (Surrogate)	EBH101_0.1-0.2	SE220848.001	%	60 - 130%	71
	EBH102_0.1-0.2	SE220848.002	%	60 - 130%	74
	EBH103_0.1-0.2	SE220848.003	%	60 - 130%	68

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 identifier 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)	EBH104_0.1-0.2	SE220848.004	%	60 - 130%	68
	QD1	SE220848.005	%	60 - 130%	68
	QTB1	SE220848.009	%	60 - 130%	77
	QTS1	SE220848.010	%	60 - 130%	72

VOCs in Water

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH101M	SE220848.006	%	40 - 130%	102
	GWQD1	SE220848.007	%	40 - 130%	102
	QR1	SE220848.008	%	40 - 130%	103
d4-1,2-dichloroethane (Surrogate)	BH101M	SE220848.006	%	40 - 130%	96
	GWQD1	SE220848.007	%	40 - 130%	96
	QR1	SE220848.008	%	40 - 130%	98
d8-toluene (Surrogate)	BH101M	SE220848.006	%	40 - 130%	95
	GWQD1	SE220848.007	%	40 - 130%	95
	QR1	SE220848.008	%	40 - 130%	95

Volatile Petroleum Hydrocarbons in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	EBH101_0.1-0.2	SE220848.001	%	60 - 130%	85
	EBH102_0.1-0.2	SE220848.002	%	60 - 130%	82
	EBH103_0.1-0.2	SE220848.003	%	60 - 130%	76
	EBH104_0.1-0.2	SE220848.004	%	60 - 130%	80
	QD1	SE220848.005	%	60 - 130%	78
d4-1,2-dichloroethane (Surrogate)	EBH101_0.1-0.2	SE220848.001	%	60 - 130%	90
	EBH102_0.1-0.2	SE220848.002	%	60 - 130%	90
	EBH103_0.1-0.2	SE220848.003	%	60 - 130%	86
	EBH104_0.1-0.2	SE220848.004	%	60 - 130%	83
	QD1	SE220848.005	%	60 - 130%	87
d8-toluene (Surrogate)	EBH101_0.1-0.2	SE220848.001	%	60 - 130%	71
	EBH102_0.1-0.2	SE220848.002	%	60 - 130%	74
	EBH103_0.1-0.2	SE220848.003	%	60 - 130%	68
	EBH104_0.1-0.2	SE220848.004	%	60 - 130%	68
	QD1	SE220848.005	%	60 - 130%	68

Volatile Petroleum Hydrocarbons in Water

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH101M	SE220848.006	%	40 - 130%	102
	GWQD1	SE220848.007	%	40 - 130%	102
	QR1	SE220848.008	%	40 - 130%	103
d4-1,2-dichloroethane (Surrogate)	BH101M	SE220848.006	%	60 - 130%	96
	GWQD1	SE220848.007	%	60 - 130%	96
	QR1	SE220848.008	%	60 - 130%	98
d8-toluene (Surrogate)	BH101M	SE220848.006	%	40 - 130%	95
	GWQD1	SE220848.007	%	40 - 130%	95
	QR1	SE220848.008	%	40 - 130%	95

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
LB227098.001	Mercury	mg/L	0.0001	<0.0001

Mercury in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB227375.001	Mercury	mg/kg	0.05	<0.05

OC Pesticides in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB227177.001	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)	%	-	89

OP Pesticides in Soil

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

Sample Number	Parameter	Units	LOR	Result	
LB227177.001	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)	%	-	94
		d14-p-terphenyl (Surrogate)	%	-	96

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB227177.001	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
LB227177.001	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)	%	-
2-fluorobiphenyl (Surrogate)		%	-	94
d14-p-terphenyl (Surrogate)		%	-	96

PAH (Polynuclear Aromatic Hydrocarbons) in Water

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

Sample Number	Parameter	Units	LOR	Result
LB227088.001	Naphthalene	µg/L	0.1	<0.1
	2-methylnaphthalene	µg/L	0.1	<0.1
	1-methylnaphthalene	µg/L	0.1	<0.1
	Acenaphthylene	µg/L	0.1	<0.1
	Acenaphthene	µg/L	0.1	<0.1
	Fluorene	µg/L	0.1	<0.1
	Phenanthrene	µg/L	0.1	<0.1
	Anthracene	µg/L	0.1	<0.1
	Fluoranthene	µg/L	0.1	<0.1
	Pyrene	µg/L	0.1	<0.1
	Benzo(a)anthracene	µg/L	0.1	<0.1
	Chrysene	µg/L	0.1	<0.1
	Benzo(a)pyrene	µg/L	0.1	<0.1
	Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1
	Dibenzo(ah)anthracene	µg/L	0.1	<0.1
	Benzo(ghi)perylene	µg/L	0.1	<0.1
	Surrogates	d5-nitrobenzene (Surrogate)	%	-
2-fluorobiphenyl (Surrogate)		%	-	66
d14-p-terphenyl (Surrogate)		%	-	72

PCBs in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB227177.001	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)	%	-	89

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

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

Sample Number	Parameter	Units	LOR	Result
LB227364.001	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
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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.

Trace Metals (Dissolved) in Water by ICPMS (continued)

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

Sample Number	Parameter	Units	LOR	Result
LB227126.001	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
LB227126.025	Zinc, Zn	µg/L	5	<5
	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
LB227177.001	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
LB227088.001	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	Result	
LB227181.001	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
	Polycyclic VOCs	o-xylene	mg/kg	0.1	<0.1
		Naphthalene	mg/kg	0.1	<0.1
		Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-
	d8-toluene (Surrogate)		%	-	108
	Bromofluorobenzene (Surrogate)		%	-	99
	Totals	Total BTEX	mg/kg	0.6	<0.6

VOCs in Water

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

Sample Number	Parameter	Units	LOR	Result	
LB227471.001	Fumigants	2,2-dichloropropane	µg/L	0.5	<0.5
		1,2-dichloropropane	µg/L	0.5	<0.5
		cis-1,3-dichloropropene	µg/L	0.5	<0.5
		trans-1,3-dichloropropene	µg/L	0.5	<0.5
		1,2-dibromoethane (EDB)	µg/L	0.5	<0.5
	Halogenated Aliphatics	Dichlorodifluoromethane (CFC-12)	µg/L	5	<5
		Chloromethane	µg/L	5	<5
		Vinyl chloride (Chloroethene)	µg/L	0.3	<0.3
		Bromomethane	µg/L	10	<10
		Chloroethane	µg/L	5	<5
		Trichlorofluoromethane	µg/L	1	<1
		Iodomethane	µg/L	5	<5
		1,1-dichloroethene	µg/L	0.5	<0.5
		Dichloromethane (Methylene chloride)	µg/L	5	<5
		Allyl chloride	µg/L	2	<2
		trans-1,2-dichloroethene	µg/L	0.5	<0.5
		1,1-dichloroethane	µg/L	0.5	<0.5
		cis-1,2-dichloroethene	µg/L	0.5	<0.5

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.

VOCs in Water (continued)

Method: ME-(AU)-IENVJAN433

Sample Number	Parameter	Units	LOR	Result		
LB227471.001	Halogenated Aliphatics	Bromochloromethane	µg/L	0.5	<0.5	
		1,2-dichloroethane	µg/L	0.5	<0.5	
		1,1,1-trichloroethane	µg/L	0.5	<0.5	
		1,1-dichloropropene	µg/L	0.5	<0.5	
		Carbon tetrachloride	µg/L	0.5	<0.5	
		Dibromomethane	µg/L	0.5	<0.5	
		Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	<0.5	
		1,1,2-trichloroethane	µg/L	0.5	<0.5	
		1,3-dichloropropane	µg/L	0.5	<0.5	
		Tetrachloroethene (Perchloroethylene,PCE)	µg/L	0.5	<0.5	
		1,1,1,2-tetrachloroethane	µg/L	0.5	<0.5	
		cis-1,4-dichloro-2-butene	µg/L	1	<1	
		1,1,2,2-tetrachloroethane	µg/L	0.5	<0.5	
		1,2,3-trichloropropane	µg/L	0.5	<0.5	
		trans-1,4-dichloro-2-butene	µg/L	1	<1	
		1,2-dibromo-3-chloropropane	µg/L	0.5	<0.5	
		Hexachlorobutadiene	µg/L	0.5	<0.5	
		Halogenated Aromatics	Chlorobenzene	µg/L	0.5	<0.5
	Bromobenzene		µg/L	0.5	<0.5	
	2-chlorotoluene		µg/L	0.5	<0.5	
	4-chlorotoluene		µg/L	0.5	<0.5	
	1,3-dichlorobenzene		µg/L	0.5	<0.5	
	1,4-dichlorobenzene		µg/L	0.3	<0.3	
	1,2-dichlorobenzene		µg/L	0.5	<0.5	
	1,2,4-trichlorobenzene		µg/L	0.5	<0.5	
	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	
		Styrene (Vinyl benzene)	µg/L	0.5	<0.5	
		Isopropylbenzene (Cumene)	µg/L	0.5	<0.5	
		n-propylbenzene	µg/L	0.5	<0.5	
		1,3,5-trimethylbenzene	µg/L	0.5	<0.5	
		tert-butylbenzene	µg/L	0.5	<0.5	
		1,2,4-trimethylbenzene	µg/L	0.5	<0.5	
		sec-butylbenzene	µg/L	0.5	<0.5	
		p-isopropyltoluene	µg/L	0.5	<0.5	
		n-butylbenzene	µg/L	0.5	<0.5	
		Nitrogenous Compounds	Acrylonitrile	µg/L	0.5	<0.5
		Oxygenated Compounds	Acetone (2-propanone)	µg/L	10	<10
			MtBE (Methyl-tert-butyl ether)	µg/L	2	<2
	Vinyl acetate		µg/L	10	<10	
	MEK (2-butanone)		µg/L	10	<10	
	MIBK (4-methyl-2-pentanone)		µg/L	5	<5	
2-hexanone (MBK)	µg/L		5	<5		
Polycyclic VOCs	Naphthalene	µg/L	0.5	<0.5		
Sulphonated	Carbon disulfide	µg/L	2	<2		
Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	95		
	d8-toluene (Surrogate)	%	-	93		
	Bromofluorobenzene (Surrogate)	%	-	100		
Trihalomethanes	Chloroform (THM)	µg/L	0.5	<0.5		
	Bromodichloromethane (THM)	µg/L	0.5	<0.5		
	Dibromochloromethane (THM)	µg/L	0.5	<0.5		
	Bromoform (THM)	µg/L	0.5	<0.5		

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-IENVJAN433

Sample Number	Parameter	Units	LOR
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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.

Volatile Petroleum Hydrocarbons in Soil (continued)

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

Sample Number	Parameter	Units	LOR	Result
LB227181.001	TRH C6-C9	mg/kg	20	<20
	Surrogates			
	d4-1,2-dichloroethane (Surrogate)	%	-	109

Volatile Petroleum Hydrocarbons in Water

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

Sample Number	Parameter	Units	LOR	Result
LB227471.001	TRH C6-C9	µg/L	40	<40
	Surrogates			
	d4-1,2-dichloroethane (Surrogate)	%	-	95
	d8-toluene (Surrogate)	%	-	93
	Bromofluorobenzene (Surrogate)	%	-	100

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

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: $MAD = 100 \times SDL / Mean + LR$

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 identifier 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 %
SE220821.006	LB227098.014	Mercury	µg/L	0.0001	<0.0001	<0.0001	200	0
SE220848.008	LB227098.024	Mercury	µg/L	0.0001	<0.0001	<0.0001	200	198

Mercury in Soil

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE220829.010	LB227375.014	Mercury	mg/kg	0.05	<0.05	<0.05	133	0
SE220848.005	LB227375.023	Mercury	mg/kg	0.05	<0.05	<0.05	161	0

Moisture Content

Method: ME-(AU)-[ENV]AN022

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE220738.012	LB227188.011	% Moisture	%w/w	1	<1	<1	200	0
SE220848.004	LB227188.022	% Moisture	%w/w	1	24.5	25.7	34	5
SE220848.009	LB227188.025	% Moisture	%w/w	1	<1	<1	200	0

OC Pesticides in Soil

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE220738.004	LB227177.032	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		
SE220848.004	LB227177.027	Surrogates	mg/kg	-	0.14	0.14	30	0
		Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.14	0.14	30	0
		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	125	1
		trans-Nonachlor	mg/kg	0.1	0.1	0.2	98	8
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0		

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

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: $MAD = 100 \times SDL / Mean + LR$

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 identifier 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]JAN420

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE220848.004	LB227177.027	Dieldrin	mg/kg	0.2	<0.2	<0.2	89	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
Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.15	0.15	30	2	

OP Pesticides in Soil

Method: ME-(AU)-[ENV]JAN420

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %	
SE220738.004	LB227177.028	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	
		Methodathion	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	-	0.4	0.4	30	0
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	0
SE220848.003	LB227177.029	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	
		Methodathion	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	0.4	30	7
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	0

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]JAN420

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE220738.004	LB227177.028	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

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

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: $MAD = 100 \times SDL / Mean + LR$

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 identifier 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)-ENVJAN420

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %	
SE220738.004	LB227177.028	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	-	0.4	0.4	30	0
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	0
d14-p-terphenyl (Surrogate)	mg/kg		-	0.4	0.4	30	0		
SE220848.003	LB227177.029	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	2
2-fluorobiphenyl (Surrogate)	mg/kg		-	0.5	0.4	30	7		
d14-p-terphenyl (Surrogate)	mg/kg		-	0.5	0.5	30	0		

PCBs in Soil

Method: ME-(AU)-ENVJAN420

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE220738.004	LB227177.029	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
SE220848.004	LB227177.027	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

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

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: $MAD = 100 \times SDL / Mean + LR$

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 identifier 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

PCBs in Soil (continued)

Method: ME-(AU)-[ENV]JAN240

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE220848.004	LB227177.027	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0	0	30	2

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

Method: ME-(AU)-[ENV]JAN040/AN320

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE220829.010	LB227364.014	Arsenic, As	mg/kg	1	22	24	34	9
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.5	620	500	30	23
		Copper, Cu	mg/kg	0.5	43	50	31	15
		Nickel, Ni	mg/kg	0.5	380	600	30	46 @
		Lead, Pb	mg/kg	1	16	29	34	62 @
SE220848.005	LB227364.023	Zinc, Zn	mg/kg	2	35	41	35	16
		Arsenic, As	mg/kg	1	4	3	58	22
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.5	9.5	7.6	36	22
		Copper, Cu	mg/kg	0.5	22	23	32	2
		Nickel, Ni	mg/kg	0.5	2.6	3.1	48	16
		Lead, Pb	mg/kg	1	30	29	33	4
		Zinc, Zn	mg/kg	2	100	100	32	2

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]JAN318

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE220821.008	LB227126.014	Arsenic, As	µg/L	1	1	1	97	10
		Cadmium, Cd	µg/L	0.1	<0.1	<0.1	200	0
		Chromium, Cr	µg/L	1	<1	<1	147	0
		Copper, Cu	µg/L	1	<1	<1	200	0
		Lead, Pb	µg/L	1	<1	<1	200	0
		Nickel, Ni	µg/L	1	4	4	39	4
		Zinc, Zn	µg/L	5	<5	<5	200	0

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]JAN403

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %	
SE220738.004	LB227177.027	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
SE220848.003	LB227177.028	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

VOC's in Soil

Method: ME-(AU)-[ENV]JAN433

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %	
SE220738.009	LB227181.035	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	mg/kg	0.1	<0.1	<0.1	200	0
			Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.7	10.4	50
		d8-toluene (Surrogate)		mg/kg	-	9.5	10.3	50	8
		Bromofluorobenzene (Surrogate)		mg/kg	-	8.8	9.4	50	7

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

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: $MAD = 100 \times SDL / Mean + LR$

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 identifier 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)-ENVJAN433

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %		
SE220738.009	LB227181.035	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	
SE220848.004	LB227181.037	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	mg/kg	0.1	<0.1	<0.1	200	0	
			Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.3	8.3	50	0
				d8-toluene (Surrogate)	mg/kg	-	6.8	6.6	50	2
		Bromofluorobenzene (Surrogate)		mg/kg	-	8.0	7.5	50	7	
		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)-ENVJAN433

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %		
SE220954.001	LB227471.026	Fumigants	2,2-dichloropropane	µg/L	0.5	<0.5	<0.5	200	0	
			1,2-dichloropropane	µg/L	0.5	<0.5	<0.5	200	0	
			cis-1,3-dichloropropene	µg/L	0.5	<0.5	<0.5	200	0	
			trans-1,3-dichloropropene	µg/L	0.5	<0.5	<0.5	200	0	
			1,2-dibromoethane (EDB)	µg/L	0.5	<0.5	<0.5	200	0	
		Halogenated Aliphatics	Dichlorodifluoromethane (CFC-12)	µg/L	5	<5	<5	200	0	
			Chloromethane	µg/L	5	<5	<5	200	0	
			Vinyl chloride (Chloroethene)	µg/L	0.3	<0.3	<0.3	200	0	
			Bromomethane	µg/L	10	<10	<10	200	0	
			Chloroethane	µg/L	5	<5	<5	200	0	
			Trichlorofluoromethane	µg/L	1	<1	<1	200	0	
			Iodomethane	µg/L	5	<5	<5	200	0	
			1,1-dichloroethene	µg/L	0.5	<0.5	<0.5	200	0	
			Dichloromethane (Methylene chloride)	µg/L	5	<5	<5	200	0	
			Allyl chloride	µg/L	2	<2	<2	200	0	
			trans-1,2-dichloroethene	µg/L	0.5	<0.5	<0.5	200	0	
			1,1-dichloroethane	µg/L	0.5	<0.5	<0.5	200	0	
			cis-1,2-dichloroethene	µg/L	0.5	<0.5	<0.5	200	0	
			Bromochloromethane	µg/L	0.5	<0.5	<0.5	200	0	
			1,2-dichloroethane	µg/L	0.5	<0.5	<0.5	200	0	
			1,1,1-trichloroethane	µg/L	0.5	<0.5	<0.5	200	0	
			1,1-dichloropropene	µg/L	0.5	<0.5	<0.5	200	0	
			Carbon tetrachloride	µg/L	0.5	<0.5	<0.5	200	0	
			Dibromomethane	µg/L	0.5	<0.5	<0.5	200	0	
			Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	<0.5	<0.5	200	0	
			1,1,2-trichloroethane	µg/L	0.5	<0.5	<0.5	200	0	
			1,3-dichloropropane	µg/L	0.5	<0.5	<0.5	200	0	
			Tetrachloroethene (Perchloroethylene,PCE)	µg/L	0.5	<0.5	<0.5	200	0	
			1,1,1,2-tetrachloroethane	µg/L	0.5	<0.5	<0.5	200	0	
			cis-1,4-dichloro-2-butene	µg/L	1	<1	<1	200	0	
			1,1,2,2-tetrachloroethane	µg/L	0.5	<0.5	<0.5	200	0	
			1,2,3-trichloropropane	µg/L	0.5	<0.5	<0.5	200	0	
			trans-1,4-dichloro-2-butene	µg/L	1	<1	<1	200	0	
			1,2-dibromo-3-chloropropane	µg/L	0.5	<0.5	<0.5	200	0	
			Hexachlorobutadiene	µg/L	0.5	<0.5	<0.5	200	0	
			Halogenated Aromatics	Chlorobenzene	µg/L	0.5	<0.5	<0.5	200	0
				Bromobenzene	µg/L	0.5	<0.5	<0.5	200	0
				2-chlorotoluene	µg/L	0.5	<0.5	<0.5	200	0
				4-chlorotoluene	µg/L	0.5	<0.5	<0.5	200	0
				1,3-dichlorobenzene	µg/L	0.5	<0.5	<0.5	200	0
		1,4-dichlorobenzene		µg/L	0.3	<0.3	<0.3	200	0	
		1,2-dichlorobenzene		µg/L	0.5	<0.5	<0.5	200	0	
		1,2,4-trichlorobenzene		µg/L	0.5	<0.5	<0.5	200	0	
		1,2,3-trichlorobenzene		µg/L	0.5	<0.5	<0.5	200	0	
		Monocyclic		Benzene	µg/L	0.5	<0.5	<0.5	200	0

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

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: $MAD = 100 \times SDL / Mean + LR$

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 identifier 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

VOCs in Water (continued)

Method: ME-(AU)-ENVJAN433

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %	
SE220954.001	LB227471.026	Monocyclic 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	
		Styrene (Vinyl benzene)	µg/L	0.5	<0.5	<0.5	200	0	
		Isopropylbenzene (Cumene)	µg/L	0.5	<0.5	<0.5	200	0	
		n-propylbenzene	µg/L	0.5	<0.5	<0.5	200	0	
		1,3,5-trimethylbenzene	µg/L	0.5	<0.5	<0.5	200	0	
		tert-butylbenzene	µg/L	0.5	<0.5	<0.5	200	0	
		1,2,4-trimethylbenzene	µg/L	0.5	<0.5	<0.5	200	0	
		sec-butylbenzene	µg/L	0.5	<0.5	<0.5	200	0	
		p-isopropyltoluene	µg/L	0.5	<0.5	<0.5	200	0	
		n-butylbenzene	µg/L	0.5	<0.5	<0.5	200	0	
		Nitrogenous	Acrylonitrile	µg/L	0.5	<0.5	<0.5	200	0
		Oxygenated	Acetone (2-propanone)	µg/L	10	<10	<10	200	0
		Compounds	MIBE (Methyl-tert-butyl ether)	µg/L	2	<2	<2	200	0
			Vinyl acetate	µg/L	10	<10	<10	200	0
			MEK (2-butanone)	µg/L	10	<10	<10	200	0
			MIBK (4-methyl-2-pentanone)	µg/L	5	<5	<5	200	0
		2-hexanone (MBK)	µg/L	5	<5	<5	200	0	
		Polycyclic	Naphthalene	µg/L	0.5	<0.5	<0.5	200	0
		Sulphonated	Carbon disulfide	µg/L	2	<2	<2	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	9.7	9.1	30	7
			d8-toluene (Surrogate)	µg/L	-	9.5	9.4	30	1
			Bromofluorobenzene (Surrogate)	µg/L	-	10.4	10.0	30	4
		Trihalomethanes	Chloroform (THM)	µg/L	0.5	<0.5	<0.5	200	0
			Bromodichloromethane (THM)	µg/L	0.5	<0.5	<0.5	200	0
			Dibromochloromethane (THM)	µg/L	0.5	<0.5	<0.5	200	0
Bromoform (THM)	µg/L		0.5	<0.5	<0.5	200	0		
SE220954.008	LB227471.027	Fumigants	2,2-dichloropropane	µg/L	0.5	<0.5	<0.5	200	0
			1,2-dichloropropane	µg/L	0.5	<0.5	<0.5	200	0
			cis-1,3-dichloropropene	µg/L	0.5	<0.5	<0.5	200	0
			trans-1,3-dichloropropene	µg/L	0.5	<0.5	<0.5	200	0
			1,2-dibromoethane (EDB)	µg/L	0.5	<0.5	<0.5	200	0
		Halogenated Aliphatics	Dichlorodifluoromethane (CFC-12)	µg/L	5	<5	<5	200	0
			Chloromethane	µg/L	5	<5	<5	200	0
			Vinyl chloride (Chloroethene)	µg/L	0.3	<0.3	<0.3	200	0
			Bromomethane	µg/L	10	<10	<10	200	0
			Chloroethane	µg/L	5	<5	<5	200	0
			Trichlorofluoromethane	µg/L	1	<1	<1	200	0
			Iodomethane	µg/L	5	<5	<5	200	0
			1,1-dichloroethene	µg/L	0.5	<0.5	<0.5	200	0
			Dichloromethane (Methylene chloride)	µg/L	5	<5	<5	200	0
			Allyl chloride	µg/L	2	<2	<2	200	0
			trans-1,2-dichloroethene	µg/L	0.5	<0.5	<0.5	200	0
			1,1-dichloroethane	µg/L	0.5	<0.5	<0.5	200	0
			cis-1,2-dichloroethene	µg/L	0.5	<0.5	<0.5	200	0
			Bromochloromethane	µg/L	0.5	<0.5	<0.5	200	0
			1,2-dichloroethane	µg/L	0.5	<0.5	<0.5	200	0
			1,1,1-trichloroethane	µg/L	0.5	<0.5	<0.5	200	0
			1,1-dichloropropene	µg/L	0.5	<0.5	<0.5	200	0
			Carbon tetrachloride	µg/L	0.5	<0.5	<0.5	200	0
			Dibromomethane	µg/L	0.5	<0.5	<0.5	200	0
			Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	<0.5	<0.5	200	0
			1,1,2-trichloroethane	µg/L	0.5	<0.5	<0.5	200	0
			1,3-dichloropropane	µg/L	0.5	<0.5	<0.5	200	0
			Tetrachloroethene (Perchloroethylene,PCE)	µg/L	0.5	<0.5	<0.5	200	0
			1,1,1,2-tetrachloroethane	µg/L	0.5	<0.5	<0.5	200	0
			cis-1,4-dichloro-2-butene	µg/L	1	<1	<1	200	0
			1,1,2,2-tetrachloroethane	µg/L	0.5	<0.5	<0.5	200	0
			1,2,3-trichloropropane	µg/L	0.5	<0.5	<0.5	200	0

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

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: $MAD = 100 \times SDL / Mean + LR$

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 identifier 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

VOCs in Water (continued)

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %	
SE220954.008	LB227471.027	Halogenated	trans-1,4-dichloro-2-butene	µg/L	1	<1	<1	200	0
		Aliphatics	1,2-dibromo-3-chloropropane	µg/L	0.5	<0.5	<0.5	200	0
			Hexachlorobutadiene	µg/L	0.5	<0.5	<0.5	200	0
		Halogenated	Chlorobenzene	µg/L	0.5	<0.5	<0.5	200	0
		Aromatics	Bromobenzene	µg/L	0.5	<0.5	<0.5	200	0
			2-chlorotoluene	µg/L	0.5	<0.5	<0.5	200	0
			4-chlorotoluene	µg/L	0.5	<0.5	<0.5	200	0
			1,3-dichlorobenzene	µg/L	0.5	<0.5	<0.5	200	0
			1,4-dichlorobenzene	µg/L	0.3	<0.3	<0.3	200	0
			1,2-dichlorobenzene	µg/L	0.5	<0.5	<0.5	200	0
			1,2,4-trichlorobenzene	µg/L	0.5	<0.5	<0.5	200	0
			1,2,3-trichlorobenzene	µg/L	0.5	<0.5	<0.5	200	0
		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
			Styrene (Vinyl benzene)	µg/L	0.5	<0.5	<0.5	200	0
			Isopropylbenzene (Cumene)	µg/L	0.5	<0.5	<0.5	200	0
			n-propylbenzene	µg/L	0.5	<0.5	<0.5	200	0
			1,3,5-trimethylbenzene	µg/L	0.5	<0.5	<0.5	200	0
			tert-butylbenzene	µg/L	0.5	<0.5	<0.5	200	0
			1,2,4-trimethylbenzene	µg/L	0.5	<0.5	<0.5	200	0
			sec-butylbenzene	µg/L	0.5	<0.5	<0.5	200	0
			p-isopropyltoluene	µg/L	0.5	<0.5	<0.5	200	0
			n-butylbenzene	µg/L	0.5	<0.5	<0.5	200	0
		Nitrogenous	Acrylonitrile	µg/L	0.5	<0.5	<0.5	200	0
		Oxygenated	Acetone (2-propanone)	µg/L	10	<10	<10	200	0
		Compounds	MtBE (Methyl-tert-butyl ether)	µg/L	2	<2	<2	200	0
			Vinyl acetate	µg/L	10	<10	<10	200	0
			MEK (2-butanone)	µg/L	10	<10	<10	200	0
			MIBK (4-methyl-2-pentanone)	µg/L	5	<5	<5	200	0
			2-hexanone (MBK)	µg/L	5	<5	<5	200	0
		Polycyclic	Naphthalene	µg/L	0.5	<0.5	<0.5	200	0
		Sulphonated	Carbon disulfide	µg/L	2	<2	<2	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	9.7	9.6	30	1
			d8-toluene (Surrogate)	µg/L	-	9.5	9.5	30	0
			Bromofluorobenzene (Surrogate)	µg/L	-	10.2	10.2	30	0
		Trihalomethanes	Chloroform (THM)	µg/L	0.5	<0.5	<0.5	200	0
			Bromodichloromethane (THM)	µg/L	0.5	<0.5	<0.5	200	0
			Dibromochloromethane (THM)	µg/L	0.5	<0.5	<0.5	200	0
			Bromoform (THM)	µg/L	0.5	<0.5	<0.5	200	0

Volatile Petroleum Hydrocarbons in Soil

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %	
SE220738.009	LB227181.035	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	-	9.7	10.4	30	7
			d8-toluene (Surrogate)	mg/kg	-	9.5	10.3	30	8
			Bromofluorobenzene (Surrogate)	mg/kg	-	8.8	9.4	30	7
		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
SE220848.004	LB227181.037	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	0
			d8-toluene (Surrogate)	mg/kg	-	6.8	6.6	30	2
			Bromofluorobenzene (Surrogate)	mg/kg	-	8.0	7.5	30	7
		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
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Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: $RPD = |OriginalResult - ReplicateResult| \times 100 / Mean$

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: $MAD = 100 \times SDL / Mean + LR$

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 identifier 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

Volatile Petroleum Hydrocarbons in Water (continued)

Method: ME-(AU)-ENVJAN433

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %	
SE220954.001	LB227471.026	TRH C6-C10	µg/L	50	<0.05	<50	200	0	
		TRH C6-C9	µg/L	40	<0.04	<40	200	0	
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	9.7	9.1	30	7
			d8-toluene (Surrogate)	µg/L	-	9.5	9.4	30	1
			Bromofluorobenzene (Surrogate)	µg/L	-	10.4	10.0	30	4
		VPH F Bands	Benzene (F0)	µg/L	0.5	<0.0005	<0.5	200	0
			TRH C6-C10 minus BTEX (F1)	µg/L	50	<0.05	<50	200	0
SE220954.008	LB227471.027	TRH C6-C10	µg/L	50	<0.05	<50	200	0	
		TRH C6-C9	µg/L	40	<0.04	<40	200	0	
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	9.7	9.6	30	1
			d8-toluene (Surrogate)	µg/L	-	9.5	9.5	30	0
			Bromofluorobenzene (Surrogate)	µg/L	-	10.2	10.2	30	0
		VPH F Bands	Benzene (F0)	µg/L	0.5	<0.0005	<0.5	200	0
			TRH C6-C10 minus BTEX (F1)	µg/L	50	<0.05	<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 %
LB227375.002	Mercury	mg/kg	0.05	0.23	0.2	70 - 130	113

OC Pesticides in Soil

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB227177.002	Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	111
	Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	88
	Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	113
	Dieldrin	mg/kg	0.2	<0.2	0.2	60 - 140	95
	Endrin	mg/kg	0.2	0.2	0.2	60 - 140	115
	p,p'-DDT	mg/kg	0.1	0.2	0.2	60 - 140	108
Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.15	0.15	40 - 130	98

OP Pesticides in Soil

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %	
LB227177.002	Dichlorvos	mg/kg	0.5	1.7	2	60 - 140	83	
	Diazinon (Dimpylate)	mg/kg	0.5	1.9	2	60 - 140	95	
	Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	1.9	2	60 - 140	95	
	Ethion	mg/kg	0.2	1.6	2	60 - 140	79	
	Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	82
	d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	76	

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %	
LB227177.002	Naphthalene	mg/kg	0.1	3.5	4	60 - 140	88	
	Acenaphthylene	mg/kg	0.1	3.6	4	60 - 140	90	
	Acenaphthene	mg/kg	0.1	3.6	4	60 - 140	89	
	Phenanthrene	mg/kg	0.1	3.5	4	60 - 140	87	
	Anthracene	mg/kg	0.1	3.5	4	60 - 140	87	
	Fluoranthene	mg/kg	0.1	3.4	4	60 - 140	86	
	Pyrene	mg/kg	0.1	3.6	4	60 - 140	90	
	Benzo(a)pyrene	mg/kg	0.1	3.8	4	60 - 140	95	
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	86
	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	82	
	d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	76	

PAH (Polynuclear Aromatic Hydrocarbons) in Water

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %	
LB227088.002	Naphthalene	µg/L	0.1	25	40	60 - 140	63	
	Acenaphthylene	µg/L	0.1	29	40	60 - 140	73	
	Acenaphthene	µg/L	0.1	29	40	60 - 140	73	
	Phenanthrene	µg/L	0.1	34	40	60 - 140	85	
	Anthracene	µg/L	0.1	33	40	60 - 140	81	
	Fluoranthene	µg/L	0.1	36	40	60 - 140	91	
	Pyrene	µg/L	0.1	36	40	60 - 140	91	
	Benzo(a)pyrene	µg/L	0.1	37	40	60 - 140	93	
	Surrogates	d5-nitrobenzene (Surrogate)	µg/L	-	0.3	0.5	40 - 130	52
	2-fluorobiphenyl (Surrogate)	µg/L	-	0.3	0.5	40 - 130	64	
	d14-p-terphenyl (Surrogate)	µg/L	-	0.4	0.5	40 - 130	74	

PCBs in Soil

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB227177.002	Arochlor 1260	mg/kg	0.2	0.5	0.4	60 - 140	120

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 %
LB227364.002	Arsenic, As	mg/kg	1	340	318.22	80 - 120	108
	Cadmium, Cd	mg/kg	0.3	5.1	4.81	70 - 130	106
	Chromium, Cr	mg/kg	0.5	42	38.31	80 - 120	110
	Copper, Cu	mg/kg	0.5	320	290	80 - 120	109
	Nickel, Ni	mg/kg	0.5	190	187	80 - 120	103

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.

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

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB227364.002	Lead, Pb	mg/kg	1	93	89.9	80 - 120	104
	Zinc, Zn	mg/kg	2	280	273	80 - 120	104

Trace Metals (Dissolved) in Water by ICPMS

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB227126.002	Arsenic, As	µg/L	1	20	20	80 - 120	98
	Cadmium, Cd	µg/L	0.1	20	20	80 - 120	101
	Chromium, Cr	µg/L	1	19	20	80 - 120	95
	Copper, Cu	µg/L	1	19	20	80 - 120	95
	Lead, Pb	µg/L	1	20	20	80 - 120	101
	Nickel, Ni	µg/L	1	20	20	80 - 120	100
	Zinc, Zn	µg/L	5	20	20	80 - 120	98
LB227126.026	Arsenic, As	µg/L	1	20	20	80 - 120	101
	Cadmium, Cd	µg/L	0.1	20	20	80 - 120	98
	Chromium, Cr	µg/L	1	19	20	80 - 120	93
	Copper, Cu	µg/L	1	19	20	80 - 120	94
	Lead, Pb	µg/L	1	21	20	80 - 120	104
	Nickel, Ni	µg/L	1	20	20	80 - 120	98
	Zinc, Zn	µg/L	5	19	20	80 - 120	93

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %	
LB227177.002	TRH C10-C14	mg/kg	20	39	40	60 - 140	98	
	TRH C15-C28	mg/kg	45	<45	40	60 - 140	90	
	TRH C29-C36	mg/kg	45	<45	40	60 - 140	83	
	TRH F Bands	TRH >C10-C16	mg/kg	25	38	40	60 - 140	95
	TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	90	
	TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	80	

TRH (Total Recoverable Hydrocarbons) in Water

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %	
LB227088.002	TRH C10-C14	µg/L	50	970	1200	60 - 140	81	
	TRH C15-C28	µg/L	200	1200	1200	60 - 140	98	
	TRH C29-C36	µg/L	200	1200	1200	60 - 140	96	
	TRH F Bands	TRH >C10-C16	µg/L	60	1100	1200	60 - 140	90
	TRH >C16-C34 (F3)	µg/L	500	1200	1200	60 - 140	103	
	TRH >C34-C40 (F4)	µg/L	500	570	600	60 - 140	95	

VOC's in Soil

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %	
LB227181.002	Monocyclic	Benzene	mg/kg	0.1	4.9	5	60 - 140	97
		Toluene	mg/kg	0.1	4.9	5	60 - 140	99
	Aromatic	Ethylbenzene	mg/kg	0.1	5.0	5	60 - 140	100
		m/p-xylene	mg/kg	0.2	9.9	10	60 - 140	99
		o-xylene	mg/kg	0.1	5.0	5	60 - 140	100
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	11.3	10	70 - 130	113
		d8-toluene (Surrogate)	mg/kg	-	10.9	10	70 - 130	109
		Bromofluorobenzene (Surrogate)	mg/kg	-	10.1	10	70 - 130	101

VOCs in Water

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %		
LB227471.002	Halogenated	1,1-dichloroethene	µg/L	0.5	49	45.45	60 - 140	107	
		Aliphatics	1,2-dichloroethane	µg/L	0.5	49	45.45	60 - 140	107
			Trichloroethene (Trichloroethylene, TCE)	µg/L	0.5	48	45.45	60 - 140	106
	Halogenated	Chlorobenzene	µg/L	0.5	47	45.45	60 - 140	104	
	Monocyclic	Benzene	µg/L	0.5	49	45.45	60 - 140	108	
		Aromatic	Toluene	µg/L	0.5	49	45.45	60 - 140	108
	Ethylbenzene		µg/L	0.5	48	45.45	60 - 140	106	
	m/p-xylene		µg/L	1	97	90.9	60 - 140	107	
	Surrogates	o-xylene	µg/L	0.5	49	45.45	60 - 140	108	
		d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.5	10	60 - 140	105	
		d8-toluene (Surrogate)	µg/L	-	10.4	10	70 - 130	104	
		Bromofluorobenzene (Surrogate)	µg/L	-	9.5	10	70 - 130	95	

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.

VOCs in Water (continued)

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB227471.002	Trihalomethan Chloroform (THM)	µg/L	0.5	51	45.45	60 - 140	113

Volatile Petroleum Hydrocarbons in Soil

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %	
LB227181.002	TRH C6-C10	mg/kg	25	71	92.5	60 - 140	76	
	TRH C6-C9	mg/kg	20	63	80	60 - 140	79	
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	11.3	10	70 - 130	113
		Bromofluorobenzene (Surrogate)	mg/kg	-	10.1	10	70 - 130	101
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	41	62.5	60 - 140	65

Volatile Petroleum Hydrocarbons in Water

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %	
LB227471.002	TRH C6-C10	µg/L	50	850	946.63	60 - 140	90	
	TRH C6-C9	µg/L	40	740	818.71	60 - 140	90	
	Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.5	10	60 - 140	105
		d8-toluene (Surrogate)	µg/L	-	10.4	10	70 - 130	104
		Bromofluorobenzene (Surrogate)	µg/L	-	9.5	10	70 - 130	95
VPH F Bands	TRH C6-C10 minus BTEX (F1)	µg/L	50	560	639.67	60 - 140	87	

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 identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Mercury (dissolved) in Water

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE220807.001	LB227098.004	Mercury	mg/L	0.0001	0.0020	<0.0001	0.008	99

Mercury in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE220829.001	LB227375.004	Mercury	mg/kg	0.05	0.25	0.04087806764	0.2	107

OC Pesticides in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR	Original	Spike	Recovery%
SE220738.002	LB227177.031	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	0.2	121
		Aldrin	mg/kg	0.1	<0.1	0.2	104
		Beta BHC	mg/kg	0.1	<0.1	-	-
		Delta BHC	mg/kg	0.1	<0.1	0.2	111
		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	0.2	112
		Endrin	mg/kg	0.2	<0.2	0.2	135
		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	0.2	124
		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	-	-		
Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.13	-	89	

OP Pesticides in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR	Original	Spike	Recovery%	
SE220738.002	LB227177.027	Dichlorvos	mg/kg	0.5	<0.5	2	85	
		Dimethoate	mg/kg	0.5	<0.5	-	-	
		Diazinon (Dimpylate)	mg/kg	0.5	<0.5	2	93	
		Fenitrothion	mg/kg	0.2	<0.2	-	-	
		Malathion	mg/kg	0.2	<0.2	-	-	
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	2	95	
		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	2	78	
		Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	-	-	
		Total OP Pesticides*	mg/kg	1.7	<1.7	-	-	
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	-	90
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	-	82	

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR
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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 identifier 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	Original	Spike	Recovery%
SE220738.002	LB227177.027	Naphthalene	mg/kg	0.1	<0.1	4	88
		2-methylnaphthalene	mg/kg	0.1	<0.1	-	-
		1-methylnaphthalene	mg/kg	0.1	<0.1	-	-
		Acenaphthylene	mg/kg	0.1	<0.1	4	89
		Acenaphthene	mg/kg	0.1	<0.1	4	89
		Fluorene	mg/kg	0.1	<0.1	-	-
		Phenanthrene	mg/kg	0.1	<0.1	4	86
		Anthracene	mg/kg	0.1	<0.1	4	87
		Fluoranthene	mg/kg	0.1	<0.1	4	85
		Pyrene	mg/kg	0.1	<0.1	4	89
		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	4	92
		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	-	-
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	-	92
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	-	90
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	-	82

PCBs in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE220738.002	LB227177.028	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	0.6	<0.2	0.4	139
		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	-	89

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

Method: ME-(AU)-[ENV]AN40/AN320

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE220829.001	LB227364.004	Arsenic, As	mg/kg	1	55	10.5655476970E	50	89
		Cadmium, Cd	mg/kg	0.3	42	0.07206476329	50	83
		Chromium, Cr	mg/kg	0.5	460	60.3610865532	50	1 ⊕
		Copper, Cu	mg/kg	0.5	59	12.99157002444	50	93
		Nickel, Ni	mg/kg	0.5	200	30.3092117808	50	138 ⊕
		Lead, Pb	mg/kg	1	58	12.8085634545C	50	90
		Zinc, Zn	mg/kg	2	74	27.0764383656E	50	94

TRH (Total Recoverable Hydrocarbons) in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR	Original	Spike	Recovery%
SE220738.002	LB227177.029	TRH C10-C14	mg/kg	20	<20	40	98
		TRH C15-C28	mg/kg	45	<45	40	105
		TRH C29-C36	mg/kg	45	<45	40	90
		TRH C37-C40	mg/kg	100	<100	-	-
		TRH C10-C36 Total	mg/kg	110	<110	-	-
		TRH >C10-C40 Total (F bands)	mg/kg	210	<210	-	-
	TRH F Bands	TRH >C10-C16	mg/kg	25	<25	40	95
		TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	-	-
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	108
		TRH >C34-C40 (F4)	mg/kg	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 identifier 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%	
SE220738.001	LB227181.005	Monocyclic	Benzene	mg/kg	0.1	3.7	<0.1	5	74
		Aromatic	Toluene	mg/kg	0.1	3.9	<0.1	5	78
			Ethylbenzene	mg/kg	0.1	4.0	<0.1	5	81
			m/p-xylene	mg/kg	0.2	8.1	<0.2	10	81
			o-xylene	mg/kg	0.1	4.1	<0.1	5	82
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.7	10.2	10	97
			d8-toluene (Surrogate)	mg/kg	-	9.1	10.0	10	91
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.0	9.3	10	90
		Totals	Total Xylenes	mg/kg	0.3	12	<0.3	-	-
			Total BTEX	mg/kg	0.6	24	<0.6	-	-

VOCs in Water

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%	
SE220847.012	LB227471.028	Monocyclic	Benzene	µg/L	0.5	50	0	45.45	111
		Aromatic	Toluene	µg/L	0.5	51	0.08627126111	45.45	112
			Ethylbenzene	µg/L	0.5	50	0.01436591664	45.45	109
			m/p-xylene	µg/L	1	100	0.03790649283	90.9	110
			o-xylene	µg/L	0.5	50	0.01529462123	45.45	111
		Polycyclic	Naphthalene	µg/L	0.5	49	0.05487634812	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.5	9.72567768887	-	105
			d8-toluene (Surrogate)	µg/L	-	10.4	9.48300331547	-	104
			Bromofluorobenzene (Surrogate)	µg/L	-	9.6	10.20890841552	-	96

Volatile Petroleum Hydrocarbons in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%	
SE220738.001	LB227181.005	TRH C6-C10	TRH C6-C10	mg/kg	25	73	<25	92.5	79
			TRH C6-C9	mg/kg	20	66	<20	80	82
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.7	10.2	10	97
			d8-toluene (Surrogate)	mg/kg	-	9.1	10.0	10	91
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.0	9.3	-	90
		VPH F	Benzene (F0)	mg/kg	0.1	3.7	<0.1	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	50	<25	62.5	79

Volatile Petroleum Hydrocarbons in Water

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%	
SE220847.012	LB227471.028	TRH C6-C10	TRH C6-C10	µg/L	50	0.83	0	946.63	87
			TRH C6-C9	µg/L	40	0.71	0	818.71	87
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	0.0	9.72567768887	-	105
			d8-toluene (Surrogate)	µg/L	-	0.0	9.48300331547	-	104
			Bromofluorobenzene (Surrogate)	µg/L	-	0.0	10.20890841552	-	96
		VPH F	Benzene (F0)	µg/L	0.5		0	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	µg/L	50	0.52	0	639.67	82

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

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: $MAD = 100 \times SDL / Mean + LR$

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 identifier when outside suggested criteria. Refer to the footnotes section at the

QC Sample	Sample Number	Parameter	Units	LOR
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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.

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CLIENT DETAILS

LABORATORY DETAILS

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Project	E25203 1112-1116 Barrenjoey Road, Palm B	SGS Reference	SE220848 R0
Order Number	E25203	Date Received	18 Jun 2021
Samples	4	Date Reported	25 Jun 2021

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.

Sample #3: Chrysotile asbestos found in approx 60x40x4mm cement sheet fragment.

Sample #4: Chrysotile asbestos found in approx 10x4x2mm cement sheet fragments x2.

Asbestos analysed by Approved Identifier Yusuf Kuthpudin .

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Chemist



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Ly Kim HA
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RESULTS

Fibre Identification in soil

Method AN602

Laboratory Reference	Client Reference	Matrix	Sample Description	Date Sampled	Fibre Identification	Est.%w/w*
SE220848.001	EBH101_0.1-0.2	Soil	171g Clay, Sand, Soil, Rocks, Plant matter	18 Jun 2021	No Asbestos Found at RL of 0.1g/kg Organic Fibres Detected	<0.01
SE220848.002	EBH102_0.1-0.2	Soil	168g Clay, Sand, Soil, Rocks, Plant matter	18 Jun 2021	No Asbestos Found at RL of 0.1g/kg Organic Fibres Detected	<0.01
SE220848.003	EBH103_0.1-0.2	Soil	103g Clay, Sand, Soil, Rocks, Plant matter	18 Jun 2021	Chrysotile Asbestos Found at RL of 0.1g/kg Organic Fibres Detected	>0.01
SE220848.004	EBH104_0.1-0.2	Soil	108g Clay, Sand, Soil, Rocks, Plant matter	18 Jun 2021	No Asbestos Found at RL of 0.1g/kg Organic Fibres Detected	<0.01

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 unequivocally 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- <ul style="list-style-type: none"> (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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 Order Number **E25203**
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SGS Reference **SE220848A R0**
 Date Received 28/6/2021
 Date Reported 1/7/2021

COMMENTS

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

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TRH Silica Gel (Total Recoverable Hydrocarbons - Silica Gel) in Water [AN403] Tested: 29/6/2021

			BH101M
			WATER
			-
			18/6/2021
PARAMETER	UOM	LOR	SE220848A.006
TRH C10-C14-Silica	µg/L	50	<50
TRH C15-C28-Silica	µg/L	200	<200
TRH C29-C36-Silica	µg/L	200	<200
TRH C37-C40-Silica	µg/L	200	<200
TRH >C10-C16-Silica	µg/L	60	<60
TRH >C16-C34-Silica	µg/L	500	<500
TRH >C34-C40-Silica	µg/L	500	<500
TRH Sum C10-C36-Silica	µg/L	450	<450
TRH Sum C10-C40-Silica	µg/L	650	<650

Trace Metals (Dissolved) in Water by ICPMS [AN318] Tested: 29/6/2021

			BH101M
			WATER
			-
			18/6/2021
			SE220848A.006
PARAMETER	UOM	LOR	
Arsenic, As	µg/L	1	<1
Cadmium, Cd	µg/L	0.1	0.2
Copper, Cu	µg/L	1	15
Chromium, Cr	µg/L	1	5
Nickel, Ni	µg/L	1	470
Lead, Pb	µg/L	1	2
Zinc, Zn	µg/L	5	130

Mercury (dissolved) in Water [AN311(Perth)/AN312] Tested: 29/6/2021

			BH101M
			WATER
			-
			18/6/2021
PARAMETER	UOM	LOR	SE220848A.006
Mercury	mg/L	0.0001	<0.0001

METHOD

METHODOLOGY SUMMARY

AN020

Unpreserved water sample is filtered through a 0.45µm membrane filter and acidified with nitric acid similar to APHA3030B.

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.

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.

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 (TRHisilica) 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.

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-gb/environment-health-and-safety.

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STATEMENT OF QA/QC PERFORMANCE

SE220848A R0

CLIENT DETAILS

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PYRMONT NSW 2009

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Facsimile (Not specified)
Email Lan.ye@eiaustralia.com.au

Project **E25203 1112-1116 Barrenjoey Road, Palm B**
Order Number **E25203**
Samples 10

LABORATORY DETAILS

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Laboratory SGS Alexandria Environmental
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Telephone +61 2 8594 0400
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SGS Reference **SE220848A R0**
Date Received 28 Jun 2021
Date Reported 01 Jul 2021

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:

Extraction Date	TRH Silica Gel (Total Recoverable Hydrocarbons - Silica Gel) in Water	1 item
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SAMPLE SUMMARY

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

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
BH101M	SE220848A.006	LB227735	18 Jun 2021	28 Jun 2021	16 Jul 2021	29 Jun 2021	16 Jul 2021	29 Jun 2021

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
BH101M	SE220848A.006	LB227819	18 Jun 2021	28 Jun 2021	15 Dec 2021	29 Jun 2021	15 Dec 2021	30 Jun 2021

TRH Silica Gel (Total Recoverable Hydrocarbons - Silica Gel) in Water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101M	SE220848A.006	LB227736	18 Jun 2021	28 Jun 2021	25 Jun 2021	29 Jun 2021†	08 Aug 2021	01 Jul 2021

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 identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No surrogates were required for this job.

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(Parth)/AN312

Sample Number	Parameter	Units	LOR	Result
LB227735.001	Mercury	mg/L	0.0001	<0.0001

Trace Metals (Dissolved) in Water by ICPMS

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

Sample Number	Parameter	Units	LOR	Result
LB227819.001	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 Silica Gel (Total Recoverable Hydrocarbons - Silica Gel) In Water

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

Sample Number	Parameter	Units	LOR	Result
LB227736.001	TRH C10-C14-Silica	µg/L	50	<50
	TRH C15-C28-Silica	µg/L	200	<200
	TRH C29-C36-Silica	µg/L	200	<200
	TRH C37-C40-Silica	µg/L	200	<200

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

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: $MAD = 100 \times SDL / Mean + LR$

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 identifier 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 %
SE221132.031	LB227735.007	Mercury	µg/L	0.0001	<0.0001	<0.0001	200	0

Trace Metals (Dissolved) in Water by ICPMS

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE220931RE.00	LB227819.006	Zinc, Zn	µg/L	5	770	810	16	6

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.

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]JAN318

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB227819.002	Arsenic, As	µg/L	1	20	20	80 - 120	101
	Cadmium, Cd	µg/L	0.1	20	20	80 - 120	99
	Chromium, Cr	µg/L	1	19	20	80 - 120	97
	Copper, Cu	µg/L	1	20	20	80 - 120	98
	Lead, Pb	µg/L	1	21	20	80 - 120	105
	Nickel, Ni	µg/L	1	21	20	80 - 120	106
	Zinc, Zn	µg/L	5	21	20	80 - 120	106

TRH Silica Gel (Total Recoverable Hydrocarbons - Silica Gel) in Water

Method: ME-(AU)-[ENV]JAN403

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB227736.002	TRH C10-C14-Silica	µg/L	50	760	1200	60 - 140	64
	TRH C15-C28-Silica	µg/L	200	950	1200	60 - 140	79
	TRH C29-C36-Silica	µg/L	200	1100	1200	60 - 140	92
	TRH >C10-C16-Silica	µg/L	60	850	1200	60 - 140	71
	TRH >C16-C34-Silica	µg/L	500	1100	1200	60 - 140	95
	TRH >C34-C40-Silica	µg/L	500	520	600	60 - 140	86

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 identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Trace Metals (Dissolved) in Water by ICPMS

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE220848A.006	LB227819.004	Arsenic, As	µg/L	1	23	<1	20	110
		Cadmium, Cd	µg/L	0.1	20	0.2	20	100
		Chromium, Cr	µg/L	1	24	5	20	95
		Copper, Cu	µg/L	1	34	15	20	94
		Lead, Pb	µg/L	1	23	2	20	105
		Nickel, Ni	µg/L	1	480	470	20	84
		Zinc, Zn	µg/L	5	140	130	20	89

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: $RPD = | \text{OriginalResult} - \text{ReplicateResult} | \times 100 / \text{Mean}$

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: $MAD = 100 \times \text{SDL} / \text{Mean} + \text{LR}$

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 identifier 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.

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CERTIFICATE OF ANALYSIS 272162

Client Details

Client	El Australia
Attention	Lan Ye
Address	Suite 6.01, 55 Miller Street, Pyrmont, NSW, 2009

Sample Details

Your Reference	<u>E25203, 1112-1116 Barrenjoey Road, Palm Beach</u>
Number of Samples	1 soil, 1 Water
Date samples received	21/06/2021
Date completed instructions received	21/06/2021

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	28/06/2021
Date of Issue	28/06/2021
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Results Approved By

Dragana Tomas, Senior Chemist
Giovanni Agosti, Group Technical Manager
Thomas Beenie, Lab Technician

Authorised By

Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		272162-1
Your Reference	UNITS	QT1
Date Sampled		18/06/2021
Type of sample		soil
Date extracted	-	22/06/2021
Date analysed	-	22/06/2021
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	<3
Surrogate aaa-Trifluorotoluene	%	103

svTRH (C10-C40) in Soil		
Our Reference		272162-1
Your Reference	UNITS	QT1
Date Sampled		18/06/2021
Type of sample		soil
Date extracted	-	22/06/2021
Date analysed	-	23/06/2021
TRH C ₁₀ - C ₁₄	mg/kg	<50
TRH C ₁₅ - C ₂₈	mg/kg	110
TRH C ₂₉ - C ₃₆	mg/kg	230
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	270
TRH >C ₃₄ -C ₄₀	mg/kg	150
Total +ve TRH (>C10-C40)	mg/kg	420
Surrogate o-Terphenyl	%	92

Acid Extractable metals in soil		
Our Reference		272162-1
Your Reference	UNITS	QT1
Date Sampled		18/06/2021
Type of sample		soil
Date prepared	-	23/06/2021
Date analysed	-	24/06/2021
Arsenic	mg/kg	<4
Cadmium	mg/kg	<0.4
Chromium	mg/kg	8
Copper	mg/kg	24
Lead	mg/kg	25
Mercury	mg/kg	<0.1
Nickel	mg/kg	4
Zinc	mg/kg	100

Moisture		
Our Reference		272162-1
Your Reference	UNITS	QT1
Date Sampled		18/06/2021
Type of sample		soil
Date prepared	-	22/06/2021
Date analysed	-	23/06/2021
Moisture	%	28

vTRH(C6-C10)/BTEXN in Water		
Our Reference		272162-2
Your Reference	UNITS	GWQT1
Date Sampled		18/06/2021
Type of sample		Water
Date extracted	-	23/06/2021
Date analysed	-	23/06/2021
TRH C ₆ - C ₉	µg/L	10
TRH C ₆ - C ₁₀	µg/L	41
TRH C ₆ - C ₁₀ less BTEX (F1)	µg/L	40
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	2
Naphthalene	µg/L	<1
Surrogate Dibromofluoromethane	%	106
Surrogate toluene-d8	%	99
Surrogate 4-BFB	%	100

svTRH (C10-C40) in Water		
Our Reference		272162-2
Your Reference	UNITS	GWQT1
Date Sampled		18/06/2021
Type of sample		Water
Date extracted	-	22/06/2021
Date analysed	-	22/06/2021
TRH C ₁₀ - C ₁₄	µg/L	96
TRH C ₁₅ - C ₂₈	µg/L	<100
TRH C ₂₉ - C ₃₆	µg/L	<100
TRH >C ₁₀ - C ₁₆	µg/L	90
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	µg/L	90
TRH >C ₁₆ - C ₃₄	µg/L	<100
TRH >C ₃₄ - C ₄₀	µg/L	<100
Surrogate o-Terphenyl	%	79

HM in water - dissolved		
Our Reference		272162-2
Your Reference	UNITS	GWQT1
Date Sampled		18/06/2021
Type of sample		Water
Date prepared	-	22/06/2021
Date analysed	-	22/06/2021
Arsenic-Dissolved	µg/L	<1
Cadmium-Dissolved	µg/L	0.1
Chromium-Dissolved	µg/L	8
Copper-Dissolved	µg/L	17
Lead-Dissolved	µg/L	2
Mercury-Dissolved	µg/L	<0.05
Nickel-Dissolved	µg/L	530
Zinc-Dissolved	µg/L	130

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.
Metals-022	Determination of various metals by ICP-MS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-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	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil				Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			23/06/2021	[NT]	[NT]	[NT]	[NT]	22/06/2021	[NT]
Date analysed	-			23/06/2021	[NT]	[NT]	[NT]	[NT]	22/06/2021	[NT]
TRH C ₆ - C ₉	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	100	[NT]
TRH C ₆ - C ₁₀	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	100	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	[NT]	[NT]	[NT]	[NT]	105	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	[NT]	[NT]	[NT]	[NT]	98	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	100	[NT]
o-Xylene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
naphthalene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	94	[NT]	[NT]	[NT]	[NT]	96	[NT]

Client Reference: E25203, 1112-1116 Barrenjoey Road, Palm Beach

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			22/06/2021	[NT]	[NT]	[NT]	[NT]	22/06/2021	[NT]
Date analysed	-			23/06/2021	[NT]	[NT]	[NT]	[NT]	23/06/2021	[NT]
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	128	[NT]
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	113	[NT]
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	123	[NT]
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	128	[NT]
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	113	[NT]
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	123	[NT]
Surrogate o-Terphenyl	%		Org-020	82	[NT]	[NT]	[NT]	[NT]	109	[NT]

Client Reference: E25203, 1112-1116 Barrenjoey Road, Palm Beach

QUALITY CONTROL: Acid Extractable metals in soil				Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			23/06/2021	[NT]	[NT]	[NT]	[NT]	23/06/2021	[NT]
Date analysed	-			24/06/2021	[NT]	[NT]	[NT]	[NT]	24/06/2021	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	106	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	105	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			23/06/2021	[NT]	[NT]	[NT]	[NT]	23/06/2021	[NT]
Date analysed	-			23/06/2021	[NT]	[NT]	[NT]	[NT]	23/06/2021	[NT]
TRH C ₆ - C ₉	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	106	[NT]
TRH C ₆ - C ₁₀	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	106	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	109	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	110	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Naphthalene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	100	[NT]	[NT]	[NT]	[NT]	99	[NT]
Surrogate toluene-d8	%		Org-023	99	[NT]	[NT]	[NT]	[NT]	99	[NT]
Surrogate 4-BFB	%		Org-023	101	[NT]	[NT]	[NT]	[NT]	100	[NT]

Client Reference: E25203, 1112-1116 Barrenjoey Road, Palm Beach

QUALITY CONTROL: svTRH (C10-C40) in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			22/06/2021	[NT]	[NT]	[NT]	[NT]	22/06/2021	[NT]
Date analysed	-			22/06/2021	[NT]	[NT]	[NT]	[NT]	22/06/2021	[NT]
TRH C ₁₀ - C ₁₄	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	121	[NT]
TRH C ₁₅ - C ₂₈	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	125	[NT]
TRH C ₂₉ - C ₃₆	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	84	[NT]
TRH >C ₁₀ - C ₁₆	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	121	[NT]
TRH >C ₁₆ - C ₃₄	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	125	[NT]
TRH >C ₃₄ - C ₄₀	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	84	[NT]
Surrogate o-Terphenyl	%		Org-020	86	[NT]	[NT]	[NT]	[NT]	99	[NT]

QUALITY CONTROL: HM in water - dissolved				Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	[NT]
Date prepared	-			22/06/2021	[NT]	[NT]	[NT]	[NT]	22/06/2021	[NT]
Date analysed	-			22/06/2021	[NT]	[NT]	[NT]	[NT]	22/06/2021	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	111	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	117	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	[NT]	[NT]	[NT]	[NT]	97	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	109	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	98	[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.

CLIENT DETAILS

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Project **E25203 1112-6 Barrenjoey Rd Palm Beach**
 Order Number **E25203**
 Samples 13

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SGS Reference **SE220686C R0**
 Date Received 23/6/2021
 Date Reported 24/6/2021

COMMENTS

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

Chromium Suite subcontracted to SGS Cairns, 2/58 Comport St, Portsmith QLD 4870, NATA Accreditation Number: 2562, Site Number: 3146. CE153344A

SIGNATORIES

Moisture Content [AN002] Tested: 24/6/2021

PARAMETER	UOM	LOR	BH102_3.0-3.2	BH102_4.0-4.2	BH102_5.0-6.2
			SOIL - 11/6/2021 SE220686C.007	SOIL - 11/6/2021 SE220686C.008	SOIL - 11/6/2021 SE220686C.009
% Moisture	%w/w	0.5	39	40	35

TAA (Titratable Actual Acidity) [AN219] Tested: 24/6/2021

PARAMETER	UOM	LOR	BH102_3.0-3.2	BH102_4.0-4.2	BH102_5.0-6.2
			SOIL - 11/6/2021 SE220686C.007	SOIL - 11/6/2021 SE220686C.008	SOIL - 11/6/2021 SE220686C.009
pH KCl*	pH Units	-	4.7	4.0	4.5
Titratable Actual Acidity	kg H2SO4/T	0.25	1.3	6.4	2.1
Titratable Actual Acidity (TAA) moles H+/tonne	moles H+/T	5	27	130	42
Titratable Actual Acidity (TAA) S%/w	%w/w S	0.01	0.04	0.21	0.07
Sulphur (SKCl)	%w/w	0.005	-	<0.005	-

Chromium Reducible Sulphur (CRS) [AN217] Tested: 24/6/2021

PARAMETER	UOM	LOR	BH102_3.0-3.2	BH102_4.0-4.2	BH102_5.0-6.2
			SOIL - 11/6/2021 SE220686C.007	SOIL - 11/6/2021 SE220686C.008	SOIL - 11/6/2021 SE220686C.009
Chromium Reducible Sulphur (Scr)	%	0.005	<0.005	<0.005	<0.005
Chromium Reducible Sulphur (Scr)	moles H+/T	5	<5	<5	<5

HCl Extractable S, Ca and Mg in Soil ICP OES [AN014] Tested: 24/6/2021

			BH102_4.0-4.2
			SOIL
			-
			11/6/2021
PARAMETER	UOM	LOR	SE220686C.008
Acid Soluble Sulfur (SHCI)	%w/w	0.005	0.059

Chromium Suite Net Acidity Calculations [AN220] Tested: 24/6/2021

PARAMETER	UOM	LOR	BH102_3.0-3.2	BH102_4.0-4.2	BH102_5.0-6.2
			SOIL - 11/6/2021 SE220686C.007	SOIL - 11/6/2021 SE220686C.008	SOIL - 11/6/2021 SE220686C.009
s-Net Acidity	%w/w S	0.005	0.046	0.25	0.070
a-Net Acidity	moles H+/T	5	29	160	44
Liming Rate*	kg CaCO3/T	0.1	2.1	12	3.3
Verification s-Net Acidity*	%w/w S	-20	0.00	0.00	0.00
a-Net Acidity without ANCBT*	moles H+/T	5	29	160	44
Liming Rate without ANCBT*	kg CaCO3/T	0.1	2.1	12	3.3
s-Net Acidity without ANC	%w/w S	0.005	0.046	0.25	0.070

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.
AN014	This method is for the determination of soluble sulfate (SO ₄ -S) by extraction with hydrochloric acid. Sulphides should not react and would normally be expelled. Sulfur is determined by ICP.
AN214	Acid Neutralising Capacity (ANC) or Neutralising Value (NV): The crushed or as received sample is reacted with excess normal acid (HCl) and then back titrated with standard sodium hydroxide to determine the acid consumed. The result is expressed as kg H ₂ SO ₄ /tonne or %CaCO ₃ . Based on AS4969-13.
AN217	Dried pulped sample is mixed with acid and chromium metal in a rapid distillation unit to produce hydrogen sulfide (H ₂ S) which is collected and titrated with iodine (I ₂ (aq)) to measure SCR.
AN219	Dried pulped sample is extracted for 4 hours in a 1 M KCl solution. The ratio of sample to solution is 1:40. The extract is titrated for acidity. Calcium, magnesium, and sulfur are determined by ICP-AES.
AN220	Chromium Suite: Scheme for the calculation of net acidities and liming rates using a Fineness Factor of 1.5.

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-gb/environment-health-and-safety.

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CLIENT DETAILS

LABORATORY DETAILS

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Project	E25203 1112-6 Barrenjoey Rd Palm Beach	SGS Reference	CE153344A R0
Order Number	SE220686C	Date Received	23 Jun 2021
Samples	13	Date Reported	24 Jun 2021

COMMENTS

Accredited for compliance with ISO/IEC 17025 - Testing. NATA accredited laboratory 2562(3146/19038)

SIGNATORIES



Anthony NILSSON
Operations Manager



Jon DICKER
Manager Northern QLD

Parameter	Units	LOR	Sample Number	CE153344A.001	CE153344A.002	CE153344A.003	CE153344A.004
			Sample Matrix	Soil	Soil	Soil	Soil
			Sample Date	06 Nov 2021	06 Nov 2021	06 Nov 2021	06 Nov 2021
			Sample Name	SE220686C.001	SE220686C.002	SE220686C.003	SE220686C.004

Moisture Content Method: AN002 Tested: 24/6/2021

Parameter	Units	LOR	CE153344A.001	CE153344A.002	CE153344A.003	CE153344A.004
% Moisture	%w/w	0.5	-	-	-	-

TAA (Titratable Actual Acidity) Method: AN219 Tested: 24/6/2021

Parameter	Units	LOR	CE153344A.001	CE153344A.002	CE153344A.003	CE153344A.004
pH KCl	pH Units	-	-	-	-	-
Titratable Actual Acidity	kg H2SO4/T	0.25	-	-	-	-
Titratable Actual Acidity (TAA) moles H+/tonne	moles H+/T	5	-	-	-	-
Titratable Actual Acidity (TAA) S%w/w	%w/w S	0.01	-	-	-	-
Sulphur (SKCl)	%w/w	0.005	-	-	-	-
Net Acid Soluble Sulphur (Snas) moles H+/tonne	moles H+/T	3	-	-	-	-
Net Acid Soluble Sulphur (Snas)	%w/w	0.005	-	-	-	-

Chromium Reducible Sulphur (CRS) Method: AN217 Tested: 24/6/2021

Parameter	Units	LOR	CE153344A.001	CE153344A.002	CE153344A.003	CE153344A.004
Chromium Reducible Sulphur (Scr)	%	0.005	-	-	-	-
Chromium Reducible Sulphur (Scr)	moles H+/T	5	-	-	-	-

HCl Extractable S, Ca and Mg in Soil ICP OES Method: AN014 Tested: 24/6/2021

Parameter	Units	LOR	CE153344A.001	CE153344A.002	CE153344A.003	CE153344A.004
Acid Soluble Sulfur (SHCl)	%w/w	0.005	-	-	-	-

Chromium Suite Net Acidity Calculations Method: AN220 Tested: 24/6/2021

Parameter	Units	LOR	CE153344A.001	CE153344A.002	CE153344A.003	CE153344A.004
s-Net Acidity	%w/w S	0.005	-	-	-	-
s-Net Acidity without ANC	%w/w S	0.005	-	-	-	-
a-Net Acidity	moles H+/T	5	-	-	-	-
Liming Rate	kg CaCO3/T	0.1	-	-	-	-
Verification s-Net Acidity	%w/w S	-20	-	-	-	-
a-Net Acidity without ANCBT	moles H+/T	5	-	-	-	-
Liming Rate without ANCBT	kg CaCO3/T	0.1	-	-	-	-

Parameter	Units	LOR	CE153344A.005	CE153344A.006	CE153344A.007	CE153344A.008
Sample Number			CE153344A.005	CE153344A.006	CE153344A.007	CE153344A.008
Sample Matrix			Soil	Soil	Soil	Soil
Sample Date			06 Nov 2021	06 Nov 2021	06 Nov 2021	06 Nov 2021
Sample Name			SE220686C.005	SE220686C.006	SE220686C.007	SE220686C.008

Moisture Content Method: AN002 Tested: 24/6/2021

Parameter	Units	LOR	CE153344A.005	CE153344A.006	CE153344A.007	CE153344A.008
% Moisture	%w/w	0.5	-	-	39	40

TAA (Titratable Actual Acidity) Method: AN219 Tested: 24/6/2021

Parameter	Units	LOR	CE153344A.005	CE153344A.006	CE153344A.007	CE153344A.008
pH KCl	pH Units	-	-	-	4.7	4.0
Titratable Actual Acidity	kg H2SO4/T	0.25	-	-	1.3	6.4
Titratable Actual Acidity (TAA) moles H+/tonne	moles H+/T	5	-	-	27	130
Titratable Actual Acidity (TAA) S%w/w	%w/w S	0.01	-	-	0.04	0.21
Sulphur (SKCl)	%w/w	0.005	-	-	-	<0.005
Net Acid Soluble Sulphur (Snas) moles H+/tonne	moles H+/T	3	-	-	-	36
Net Acid Soluble Sulphur (Snas)	%w/w	0.005	-	-	-	0.057

Chromium Reducible Sulphur (CRS) Method: AN217 Tested: 24/6/2021

Parameter	Units	LOR	CE153344A.005	CE153344A.006	CE153344A.007	CE153344A.008
Chromium Reducible Sulphur (Scr)	%	0.005	-	-	<0.005	<0.005
Chromium Reducible Sulphur (Scr)	moles H+/T	5	-	-	<5	<5

HCl Extractable S, Ca and Mg in Soil ICP OES Method: AN014 Tested: 24/6/2021

Parameter	Units	LOR	CE153344A.005	CE153344A.006	CE153344A.007	CE153344A.008
Acid Soluble Sulfur (SHCl)	%w/w	0.005	-	-	-	0.059

Chromium Suite Net Acidity Calculations Method: AN220 Tested: 24/6/2021

Parameter	Units	LOR	CE153344A.005	CE153344A.006	CE153344A.007	CE153344A.008
s-Net Acidity	%w/w S	0.005	-	-	0.046	0.25
s-Net Acidity without ANC	%w/w S	0.005	-	-	0.046	0.25
a-Net Acidity	moles H+/T	5	-	-	29	160
Liming Rate	kg CaCO3/T	0.1	-	-	2.1	12
Verification s-Net Acidity	%w/w S	-20	-	-	0.00	0.00
a-Net Acidity without ANCBT	moles H+/T	5	-	-	29	160
Liming Rate without ANCBT	kg CaCO3/T	0.1	-	-	2.1	12

Parameter	Units	LOR	Sample Number	CE153344A.009	CE153344A.010	CE153344A.011	CE153344A.012
			Sample Matrix	Soil	Soil	Water	Soil
			Sample Date	06 Nov 2021	06 Nov 2021	06 Nov 2021	06 Nov 2021
			Sample Name	SE220686C.009	SE220686C.010	SE220686C.011	SE220686C.012

Moisture Content Method: AN002 Tested: 24/6/2021

% Moisture	%w/w	0.5	35	-	-	-
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TAA (Titratable Actual Acidity) Method: AN219 Tested: 24/6/2021

pH KCl	pH Units	-	4.5	-	-	-
Titratable Actual Acidity	kg H2SO4/T	0.25	2.1	-	-	-
Titratable Actual Acidity (TAA) moles H+/tonne	moles H+/T	5	42	-	-	-
Titratable Actual Acidity (TAA) S%w/w	%w/w S	0.01	0.07	-	-	-
Sulphur (SKCl)	%w/w	0.005	-	-	-	-
Net Acid Soluble Sulphur (Snas) moles H+/tonne	moles H+/T	3	-	-	-	-
Net Acid Soluble Sulphur (Snas)	%w/w	0.005	-	-	-	-

Chromium Reducible Sulphur (CRS) Method: AN217 Tested: 24/6/2021

Chromium Reducible Sulphur (Scr)	%	0.005	<0.005	-	-	-
Chromium Reducible Sulphur (Scr)	moles H+/T	5	<5	-	-	-

HCl Extractable S, Ca and Mg in Soil ICP OES Method: AN014 Tested: 24/6/2021

Acid Soluble Sulfur (SHCl)	%w/w	0.005	-	-	-	-
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Chromium Suite Net Acidity Calculations Method: AN220 Tested: 24/6/2021

s-Net Acidity	%w/w S	0.005	0.070	-	-	-
s-Net Acidity without ANC	%w/w S	0.005	0.070	-	-	-
a-Net Acidity	moles H+/T	5	44	-	-	-
Liming Rate	kg CaCO3/T	0.1	3.3	-	-	-
Verification s-Net Acidity	%w/w S	-20	0.00	-	-	-
a-Net Acidity without ANCBT	moles H+/T	5	44	-	-	-
Liming Rate without ANCBT	kg CaCO3/T	0.1	3.3	-	-	-

Sample Number CE153344A.013
 Sample Matrix Soil
 Sample Date 06 Nov 2021
 Sample Name SE220686C.013

Parameter Units LOR

Moisture Content Method: AN002 Tested: 24/6/2021

% Moisture	%w/w	0.5	-
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TAA (Titratable Actual Acidity) Method: AN219 Tested: 24/6/2021

pH KCl	pH Units	-	-
Titratable Actual Acidity	kg H2SO4/T	0.25	-
Titratable Actual Acidity (TAA) moles H+/tonne	moles H+/T	5	-
Titratable Actual Acidity (TAA) S%w/w	%w/w S	0.01	-
Sulphur (SKCl)	%w/w	0.005	-
Net Acid Soluble Sulphur (Snas) moles H+/tonne	moles H+/T	3	-
Net Acid Soluble Sulphur (Snas)	%w/w	0.005	-

Chromium Reducible Sulphur (CRS) Method: AN217 Tested: 24/6/2021

Chromium Reducible Sulphur (Scr)	%	0.005	-
Chromium Reducible Sulphur (Scr)	moles H+/T	5	-

HCl Extractable S, Ca and Mg in Soil ICP OES Method: AN014 Tested: 24/6/2021

Acid Soluble Sulfur (SHCl)	%w/w	0.005	-
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Chromium Suite Net Acidity Calculations Method: AN220 Tested: 24/6/2021

s-Net Acidity	%w/w S	0.005	-
s-Net Acidity without ANC	%w/w S	0.005	-
a-Net Acidity	moles H+/T	5	-
Liming Rate	kg CaCO3/T	0.1	-
Verification s-Net Acidity	%w/w S	-20	-
a-Net Acidity without ANCBT	moles H+/T	5	-
Liming Rate without ANCBT	kg CaCO3/T	0.1	-

MB blank results are compared to the Limit of Reporting

LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.

DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

Chromium Reducible Sulphur (CRS) Method: ME-(AU)-[ENV]AN217

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Chromium Reducible Sulphur (Scr)	LB091408	%	0.005	<0.005	0%	99%
Chromium Reducible Sulphur (Scr)	LB091408	moles H+/T	5	<5		

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.

AN014

This method is for the determination of soluble sulfate (SO₄-S) by extraction with hydrochloric acid. Sulphides should not react and would normally be expelled. Sulfur is determined by ICP.

AN217

Dried pulped sample is mixed with acid and chromium metal in a rapid distillation unit to produce hydrogen sulfide (H₂S) which is collected and titrated with iodine (I₂(aq)) to measure SCR.

AN219

Dried pulped sample is extracted for 4 hours in a 1 M KCl solution. The ratio of sample to solution is 1:40. The extract is titrated for acidity. Calcium, magnesium, and sulfur are determined by ICP-AES.

AN220

Chromium Suite: Scheme for the calculation of net acidities and liming rates using a Fineness Factor of 1.5.

FOOTNOTES

IS	Insufficient sample for analysis.	LOR	Limit of Reporting
LNR	Sample listed, but not received.	↑↓	Raised or Lowered Limit of Reporting
*	NATA accreditation does not cover the performance of this service.	QFH	QC result is above the upper tolerance
**	Indicative data, theoretical holding time exceeded.	QFL	QC result is below the lower tolerance
***	Indicates that both * and ** apply.	-	The sample was not analysed for this analyte
		NVL	Not Validated

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-gb/environment-health-and-safety.

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Project **E25203 1112-6 Barrenjoey Rd Palm Beach**
 Order Number **E25203**
 Samples 13

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SGS Reference **SE220686A R0**
 Date Received 15/6/2021
 Date Reported 16/6/2021

COMMENTS

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

SIGNATORIES



Shane MCDERMOTT
 Inorganic/Metals Chemist

Field pH for Acid Sulphate Soil [AN104] Tested: 16/6/2021

PARAMETER	UOM	LOR	BH101M_0.6-0.8	BH101M_1.6-1.8	BH102_0.8-1.0	BH102_1.8-2.0	BH102_3.0-3.2
			SOIL	SOIL	SOIL	SOIL	SOIL
			11/6/2021 SE220686A.002	11/6/2021 SE220686A.003	11/6/2021 SE220686A.005	11/6/2021 SE220686A.006	11/6/2021 SE220686A.007
pHf	pH Units	-	7.1	5.1	8.5	8.1	4.8
pHfox	pH Units	-	5.8	3.8	7.3	7.3	4.7
Reaction Rate*	No unit	-	X	X	X	X	X
pH Difference*	pH Units	-10	1.3	1.3	1.2	0.8	0.1

PARAMETER	UOM	LOR	BH102_4.0-4.2	BH102_5.0-6.2	BH102_6.0-6.2
			SOIL	SOIL	SOIL
			11/6/2021 SE220686A.008	11/6/2021 SE220686A.009	11/6/2021 SE220686A.010
pHf	pH Units	-	4.5	4.7	4.9
pHfox	pH Units	-	4.0	4.6	4.3
Reaction Rate*	No unit	-	X	X	X
pH Difference*	pH Units	-10	0.5	0.1	0.6

METHOD

METHODOLOGY SUMMARY

AN104

pHF is determined on an extract of approximately 2g of as received sample in approximately 10 mL of deionised water with pH determined after standing 30 minutes.

AN104

pHFox is determined on an extract of approximately 2g of as received sample with a few mLs of 30% hydrogen peroxide (adjusted to pH 4.5 to 5.5) with the extract reaction being rated from slight to extreme, with pH determined after reaction is complete and extract has cooled. Referenced to ASS Laboratory Methods Guidelines, method 23Af-Bf, 2004.

- 0 No Reaction
- 1 Slight Reaction
- 2 Moderate Reaction
- 3 Strong/High Reaction
- 4 Extreme/Vigorous Reaction (gas evolution and heat generation)

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-gb/environment-health-and-safety.

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Project **E25203 1112-6 Barrenjoey Rd Palm Beach**
 Order Number **E25203**
 Samples 13

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SGS Reference **SE220686A R0**
 Date Received 15 Jun 2021
 Date Reported 16 Jun 2021

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 (within the SGS Alexandria Environmental laboratory).

SAMPLE SUMMARY

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

Field pH for Acid Sulphate Soil

Method: ME-(AU)-[ENV]AN104

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101M_0.6-0.8	SE220686A.002	LB226830	11 Jun 2021	15 Jun 2021	09 Jul 2021	16 Jun 2021	09 Jul 2021	16 Jun 2021
BH101M_1.6-1.8	SE220686A.003	LB226830	11 Jun 2021	15 Jun 2021	09 Jul 2021	16 Jun 2021	09 Jul 2021	16 Jun 2021
BH102_0.8-1.0	SE220686A.005	LB226830	11 Jun 2021	15 Jun 2021	09 Jul 2021	16 Jun 2021	09 Jul 2021	16 Jun 2021
BH102_1.8-2.0	SE220686A.006	LB226830	11 Jun 2021	15 Jun 2021	09 Jul 2021	16 Jun 2021	09 Jul 2021	16 Jun 2021
BH102_3.0-3.2	SE220686A.007	LB226830	11 Jun 2021	15 Jun 2021	09 Jul 2021	16 Jun 2021	09 Jul 2021	16 Jun 2021
BH102_4.0-4.2	SE220686A.008	LB226830	11 Jun 2021	15 Jun 2021	09 Jul 2021	16 Jun 2021	09 Jul 2021	16 Jun 2021
BH102_5.0-6.2	SE220686A.009	LB226830	11 Jun 2021	15 Jun 2021	09 Jul 2021	16 Jun 2021	09 Jul 2021	16 Jun 2021
BH102_6.0-6.2	SE220686A.010	LB226830	11 Jun 2021	15 Jun 2021	09 Jul 2021	16 Jun 2021	09 Jul 2021	16 Jun 2021

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 identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No surrogates were required for this job.

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.

No method blanks were required for this job.



DUPLICATES

SE220686A R0

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

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: $MAD = 100 \times SDL / Mean + LR$

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 identifier 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

Field pH for Acid Sulphate Soil

Method: ME-(AU)-[ENV]AN104

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE220686A.010	LB226830.010	pHf	pH Units	-	4.9	4.6	30	7
		pHfox	pH Units	-	4.3	4.4	30	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.

Sample Number	Parameter	Units	LOR
---------------	-----------	-------	-----

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 identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No matrix spikes were required for this job.

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

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: $MAD = 100 \times SDL / Mean + LR$

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 identifier 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.

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SGS Reference **SE220686B R0**
 Date Received 16/6/2021
 Date Reported 23/6/2021

COMMENTS

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

SPOCAS subcontracted to SGS Cairns, 2/58 Comport St, Portsmith QLD 4870, NATA Accreditation Number: 2562, Site Number: 3146- CE153344

SIGNATORIES

Moisture Content [AN002] Tested: 23/6/2021

			BH101M_0.6-0.8	BH101M_1.6-1.8	BH102_3.0-3.2	BH102_4.0-4.2	BH102_5.0-6.2
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			11/6/2021	11/6/2021	11/6/2021	11/6/2021	11/6/2021
PARAMETER	UOM	LOR	SE220686B.002	SE220686B.003	SE220686B.007	SE220686B.008	SE220686B.009
% Moisture	%w/w	0.5	18	23	39	40	35

TAA (Titratable Actual Acidity) [AN219] Tested: 23/6/2021

PARAMETER	UOM	LOR	BH101M_0.6-0.8	BH101M_1.6-1.8	BH102_3.0-3.2	BH102_4.0-4.2	BH102_5.0-6.2
			SOIL	SOIL	SOIL	SOIL	SOIL
			11/6/2021 SE220686B.002	11/6/2021 SE220686B.003	11/6/2021 SE220686B.007	11/6/2021 SE220686B.008	11/6/2021 SE220686B.009
pH KCl*	pH Units	-	6.9	5.5	4.7	4.0	4.5
Titratable Actual Acidity	kg H2SO4/T	0.25	<0.25	2.0	1.3	6.4	2.1
Titratable Actual Acidity (TAA) moles H+/tonne	moles H+/T	5	<5	40	27	130	42
Titratable Actual Acidity (TAA) S%/w	%w/w S	0.01	<0.01	0.06	0.04	0.21	0.07
Sulphur (SKCl)	%w/w	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Calcium (CaKCl)	%w/w	0.005	0.022	0.006	0.007	0.016	0.017
Magnesium (MgKCl)	%w/w	0.005	<0.005	<0.005	<0.005	<0.005	<0.005

TPA (Titratable Peroxide Acidity) [AN218] Tested: 23/6/2021

PARAMETER	UOM	LOR	BH101M_0.6-0.8	BH101M_1.6-1.8	BH102_3.0-3.2	BH102_4.0-4.2	BH102_5.0-6.2
			SOIL	SOIL	SOIL	SOIL	SOIL
			11/6/2021 SE220686B.002	11/6/2021 SE220686B.003	11/6/2021 SE220686B.007	11/6/2021 SE220686B.008	11/6/2021 SE220686B.009
Peroxide pH (pH Ox)	pH Units	-	6.3	5.0	4.6	4.5	4.5
TPA as kg H ₂ SO ₄ /tonne	kg H ₂ SO ₄ /T	0.25	<0.25	2.5	1.8	6.7	2.2
TPA as moles H ⁺ /tonne	moles H ⁺ /T	5	<5	50	37	137	45
TPA as S % WW	%w/w S	0.01	<0.01	0.08	0.06	0.22	0.07
Titratable Sulfidic Acidity as moles H ⁺ /tonne	moles H ⁺ /T	5	<5	10	10	7	<5
Titratable Sulfidic Acidity as kg H ₂ SO ₄ /tonne	kg H ₂ SO ₄ /T	0.25	<0.25	0.49	0.49	0.37	<0.25
Titratable Sulfidic Acidity as S % WW	%w/w S	0.01	<0.01	0.02	0.02	0.01	<0.01
ANCE as % CaCO ₃	% CaCO ₃	0.01	-	-	-	-	-
ANCE as moles H ⁺ /tonne	moles H ⁺ /T	5	-	-	-	-	-
ANCE as S % WW	%w/w S	0.01	-	-	-	-	-
Peroxide Oxidisable Sulphur (Spos)*	%w/w	0.005	<0.005	<0.005	0.070	0.031	0.059
Peroxide Oxidisable Sulphur as moles H ⁺ /tonne*	moles H ⁺ /T	5	<5	<5	44	19	37
Sulphur (Sp)	%w/w	0.005	0.005	<0.005	0.072	0.032	0.060
Calcium (Cap)	%w/w	0.005	0.078	<0.005	0.069	0.010	0.061
Reacted Calcium (CaA)*	%w/w	0.005	0.055	<0.005	0.062	<0.005	0.044
Reacted Calcium (CaA)*	moles H ⁺ /T	5	28	<5	31	<5	22
Magnesium (Mgp)	%w/w	0.005	0.026	0.020	0.073	0.055	0.036
Reacted Magnesium (MgA)*	%w/w	0.005	0.025	0.020	0.072	0.054	0.034
Reacted Magnesium (MgA)*	moles H ⁺ /T	5	20	16	59	44	28
Net Acid Soluble Sulphur as % w/w*	%w/w	0.005	-	-	-	0.057	-
Net Acid Soluble Sulphur as moles H ⁺ /tonne*	moles H ⁺ /T	5	-	-	-	36	-

SPOCAS Net Acidity Calculations [AN220] Tested: 23/6/2021

PARAMETER	UOM	LOR	BH101M_0.6-0.8	BH101M_1.6-1.8	BH102_3.0-3.2	BH102_4.0-4.2	BH102_5.0-6.2
			SOIL	SOIL	SOIL	SOIL	SOIL
			11/6/2021 SE220686B.002	11/6/2021 SE220686B.003	11/6/2021 SE220686B.007	11/6/2021 SE220686B.008	11/6/2021 SE220686B.009
s-Net Acidity	%w/w S	0.005	-	-	-	-	-
a-Net Acidity	moles H+/T	5	-	-	-	-	-
Liming Rate*	kg CaCO3/T	0.1	-	-	-	-	-
Verification s-Net Acidity*	%w/w S	-20	-	-	-	-	-
a-Net Acidity without ANCE*	moles H+/T	5	-	-	-	180	-
Liming Rate without ANCE*	kg CaCO3/T	0.1	-	-	-	13	-

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.
AN218	Soil samples are subjected to extreme oxidising conditions using hydrogen peroxide. Continuous application of heat and peroxide ensure all sulfide is converted to sulfuric acid. Excess peroxide is broken down by a copper catalyst prior to titration for acidity. Calcium, magnesium, and sulfur are determined by ICP-OES. Also included is a carbonate modification step which, depending on pH after the initial oxidation, gives a measure of ANC.
AN219	Dried pulped sample is extracted for 4 hours in a 1 M KCl solution. The ratio of sample to solution is 1:40. The extract is titrated for acidity. Calcium, magnesium, and sulfur are determined by ICP-AES.
AN220	SPOCAS Suite: Scheme for the calculation of net acidities and liming rates using a Fineness Factor of 1.5.

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-gb/environment-health-and-safety.

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SGS Reference **SE220686B R0**
 Date Received 16 Jun 2021
 Date Reported 23 Jun 2021

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 (within the SGS Alexandria Environmental laboratory).

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	5 Soil
Date documentation received	16/6/2021@10:26A	Type of documentation received	Email
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	18°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

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

No holding time data is available for this job.

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 identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No surrogates were required for this job.

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.

No method blanks were required for this job.

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: $RPD = | \text{OriginalResult} - \text{ReplicateResult} | \times 100 / \text{Mean}$

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: $MAD = 100 \times \text{SDL} / \text{Mean} + \text{LR}$

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 identifier 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

No duplicates were required for this job.

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.

No laboratory control standards were required for this job.

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 identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No matrix spikes were required for this job.

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

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: $MAD = 100 \times SDL / Mean + LR$

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 identifier 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.

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Appendix K - QA/QC Assessment

K.1 Site location

K.1.1 Introduction

For the purpose of assessing the quality of data presented in this Contaminant Delineation Report, EI collected field QC samples for analysis. The primary laboratory, SGS Australia Pty Ltd (SGS) and secondary laboratory, Envirolab Services Pty Ltd (Envirolab) also prepared and analysed internal QC samples. Details of the field and laboratory QC samples, with the allowable data acceptance ranges are presented in **Table K-1**.

Table K.1 Sampling Data Quality Indicators

QA/QC Measures	Data Quality Indicators
Precision – A quantitative measure of the variability (or reproducibility) of data	<p>Data precision would be assessed by reviewing the performance of blind field duplicate sample sets, through calculation of relative percentage differences (RPD). Data precision would be deemed acceptable if RPDs are found to be less than 30%. RPDs that exceed this range may be considered acceptable where:</p> <ul style="list-style-type: none"> ▪ 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.
Accuracy – A quantitative measure of the closeness of reported data to the “true” value	<p>Data accuracy would be assessed through the analysis of:</p> <ul style="list-style-type: none"> ▪ Method blanks, which are analysed for the analytes targeted in the primary samples; ▪ Matrix spike and matrix spike duplicate sample sets; ▪ Laboratory control samples; and ▪ Calibration of instruments against known standards.
Representativeness – The confidence (expressed qualitatively) that data are representative of each medium present onsite	<p>To ensure the data produced by the laboratory is representative of conditions encountered in the field, the laboratory would carry out the following:</p> <ul style="list-style-type: none"> ▪ Blank samples will be run in parallel with field samples to confirm there are 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 are generally homogeneous, with no unacceptable instances of significant sample matrix heterogeneities; and ▪ The appropriateness of collection methodologies, handling, storage and preservation techniques will be 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	<p>Analytical data sets acquired during the assessment will be evaluated as complete, upon confirmation that:</p> <ul style="list-style-type: none"> ▪ Standard operating procedures (SOPs) for sampling protocols were adhered to; and ▪ Copies of all COC documentation are presented, reviewed and found to be properly completed. <p>It can therefore be considered whether the proportion of “useable data” generated in the data collection activities is sufficient for the purposes of the land use assessment.</p>
Comparability – The confidence (expressed qualitatively) that data may be considered to be equivalent for	<p>Given that a reported data set can comprise several data sets from separate sampling episodes, issues of comparability between data sets are reduced through adherence to SOPs and regulator-endorsed or published guidelines and standards on each data gathering activity.</p>

QA/QC Measures	Data Quality Indicators
each sampling and analytical event	In addition the data will be collected by experienced samplers and NATA-accredited laboratory methodologies will be employed in all laboratory testing programs.

K.1.2 Calculation of Relative Percentage Difference (RPD)

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.

K.2 Field QA/QC Data Evaluation

The field quality assurance/quality control (QA/QC) soil and groundwater samples collected during the investigations were as follows:

- Blind field duplicates;
- Inter-laboratory duplicates;
- Trip blanks;
- Trip spikes; and
- Rinsate blanks.

Analytical results for tested soil and groundwater QA/QC samples, including calculated RPD values between primary and duplicate samples, are presented in **Table K-2**.

K.2.1 Soil Investigation

K.2.1.1 Blind Field Duplicates

One blind field duplicate (BFD) soil sample was collected in total, as follows:

- Sample QD1 was collected from the primary sample EBH104_0.1-0.2 on 18/06/2021.

The preparation of the BFD samples involved the collection of a bulk quantity of soil from the same sampling point without mixing, before dividing the material into identical sampling vessels. The duplicate samples were then presented blind to the primary laboratory (SGS) to avoid any potential analytical bias. BFD soil samples were analysed for TRHs, BTEX and selected heavy metals and calculated RPD values were found to be within the Data Acceptance Criteria (**Appendix K, Table QC5**).

K.2.1.2 Inter-Laboratory Duplicate

Sample QT1 was collected as inter-laboratory duplicate (ILD) of the primary samples EBH104_0.1-0.2 on 18/06/2021. The preparation of the ILD sample was identical to the BFD sample, as described above, and was analysed for TRHs, BTEX and selected heavy metals. The calculated RPD values were found to be within the Data Acceptance Criteria.

K.2.1.3 Trip Blank

One trip blank (TB) sample TB was 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.

K.2.1.4 Trip Spike

One trip spike (TS) sample TS was 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.

K.2.1.5 Rinsate Blank

One rinsate blank (RB) sample BHQR-1 was submitted to the primary laboratory for TRHs, BTEX and selected heavy metals analysis, the results for which were reported below laboratory LOR.

K.2.2 Groundwater Investigation

K.2.2.1 Blind Field Duplicates

One groundwater BFD sample was collected in total, as follows:

- Sample GWQD1 was collected from the primary sample BH101M on 18/06/2021.

The preparation of BFD samples involved the decanting of the groundwater collected from the respective monitoring well into two separate groups of appropriately labelled sampling containers. Volumes were split equally between the groups of sampling bottles such that the sample contained in each individual bottle, contained a similar proportion of each water volume. Sample mixing did not occur prior to decanting, in order to preserve the concentrations of volatiles potentially present within the sample. The duplicate sample was then presented blind to the primary laboratory (SGS) to avoid any potential analytical bias. The BFDs were analysed for TRHs, BTEX and selected heavy metals. The RPD values calculated for all the analytes tested were found to be within the Data Acceptance Criteria (DAC), with the exception of Cadmium (66.67%). The reported groundwater concentration for Cadmium was within ten times the laboratory LOR and was deemed to be acceptable.

K.2.2.2 Inter-Laboratory Duplicate

One ILD sample was collected in total, as follow:

- ILD sample GWQT1 was split from the primary sample BH101M on 18/06/2021;

The preparation of a groundwater ILD sample was identical to the BFD sample as described above and also analysed for TRHs, BTEX and selected heavy metals. The RPD values calculated for the ILD samples were found to be within the Data Acceptance Criteria, with the exception of F2 (66.67%).

K.2.2.3 Trip Blanks

One trip blank (TB) sample, prepared by the primary laboratory, were analysed for BTEX by the primary laboratory during groundwater testing. TB results were reported below the laboratory LOR, indicating that ideal sample transport and handling conditions were achieved.

K.2.2.4 Trip Spikes

One TS sample was submitted to the primary laboratory for BTEX analysis, the results for which were all reported within the RPD acceptance levels for trip spike recovery. It was therefore concluded that satisfactory sample transport and handling conditions were achieved.

K.2.2.5 Rinsate Blanks

One RB samples (QR1) was submitted to the primary laboratory for TRHs, BTEX, selected heavy metals and VOCs analyses. Analytical results were reported below the laboratory LOR.

K.2.3 Assessment of Field QA/QC Data

All samples were classified in the field with respect to any observable signs of contamination based on visual and odour assessment and observable characteristics, in regards to soil and groundwater. Furthermore, samples were placed immediately into laboratory supplied containers to reduce the loss of volatiles. Results of sampling indicated that the samples collected were representative of the conditions present at the time of sampling. EI conclude that the samples collected are representative of the soils present at the respective sampling locations.

All samples, including field QC samples, were transported to the primary and secondary laboratories under strict Chain-of-Custody conditions and appropriate copies of relevant documentation were included in the respective reports.

The overall completeness of documentation produced under the field program of the subject assessment was considered to be adequate for the purposes of drawing valid conclusions regarding the environmental condition of the site.

Based on the results of the field QA/QC data EI considered the field QA/QC programme carried out during the data gap closure investigations to be appropriate and the results to be acceptable.

K.3 LABORATORY QA/QC

K.3.1 Laboratory Accreditation

To undertake all analytical testing, EI commissioned SGS as the primary laboratory and Envirolab as the secondary laboratory. SGS and Envirolab, both established analytical laboratories which operate in accordance with the guidelines set out in ISO/IEC Guide 25 “General requirements for the competence of calibration and testing laboratories”, conducted all respective analyses using National Association Testing Authorities (NATA)-registered procedures.

In relation to contingencies, should the pre-determined DQOs not be achieved, in accordance with each laboratory’s QC policy (**Appendix L**), respective tests would be accordingly repeated. Should the results again fall outside the DQOs, then sample heterogeneity may be assumed and written comment will be provided to this effect on the final laboratory certificate. The laboratory QA/QC reports are included in **Appendix L**.

K.3.2 Sample Holding Times

Sample holding times were within the laboratory DQOs, which were consistent with standard environmental protocols as tabulated in **Appendix L, Tables QC1 and QC2**.

K.3.3 Test Methods and Practical Quantitation Limits (PQLs)

Practical Quantitation Limits for all tested parameters during the assessment of soils and groundwater are presented in **Appendix L, Tables QC3 and QC4**.

K.3.4 Method Blanks

Concentrations of all parameters in method blanks during the assessment were below the laboratory PQLs and were therefore within the DAC.

K.3.5 Laboratory Duplicate Samples

The Laboratory Control Samples (LCS) for the analysis batches showed calculated RPDs that were within acceptable ranges and conformed to the DAC, with the exception of six heavy metals due to sample heterogeneity.

K.3.6 Laboratory Control Samples

The Laboratory Control Samples for the analysis batches were within acceptable ranges and conformed to the DAC.

K.3.7 Matrix Spikes

All matrix spikes for the respective sample batches were within acceptable ranges and conformed to the DAC, with the exception of two heavy metals due to sample heterogeneity and one OCP due to the presence of significant concentration of analyte (from another batch of samples).

K.3.8 Surrogate

Recovery results for all surrogate samples conformed to the DAC, with the exception of one PAH but at least 2 of 3 surrogates are within acceptance criteria.

K.3.9 Concluding Remark

Based on the laboratory QA/QC results EI considers that although a small number of discrepancies were identified, which in most cases could be attributed to the non-homogenous nature of the submitted samples, the data generally confirms that the analytical results for the various phases of laboratory testing were valid and useable for interpretation purposes.

Table K-2 - Summary of Field QA/QC Samples Results

Sample identification	Sampling 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
SGS PQL for Soil			25	25	90	120	0.1	0.1	0.1	0.3	3	0.3	0.3	0.5	1	0.01	0.5	0.5
SGS PQL for Groundwater			50	60	500	500	0.5	0.5	0.5	1.5	1	0.1	1	1	1	0.1	1	5
Soil Assessment																		
EBH104_0.1-0.2	18/06/2021	Topsoil	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	4	<0.3	9.4	31	40	0.15	3	150
QD1		Intra-lab Duplicate	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	4	<0.3	9.5	22	30	<0.05	2.6	100
		RPD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.06	33.96	28.57	100.00	14.29	40.00
EBH104_0.1-0.2	18/06/2021	Topsoil	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	4	<0.3	9.4	31	40	0.15	3	150
QT1		Inter-lab Duplicate	<25	<50	<100	<100	<1	<1	<1	<2	<4	<0.4	8	24	25	<0.1	4	100
		RPD	0.00	NA	NA	NA	NA	NA	NA	NA	0.00	NA	16.09	25.45	46.15	40.00	28.57	40.00
QR1		Rinsate	-	-	-	-	-	-	-	-	<1	<0.1	<1	<1	<1	<0.1	<1	<5
QTB1	18/06/2021	Trip blank	-	-	-	-	<0.1	<0.1	<0.1	<0.3	-	-	-	-	-	-	-	-
QTS1		Trip spike	-	-	-	-	[104%]	[116%]	[96%]	[94%]	-	-	-	-	-	-	-	-
BHQR-1		Rinsate	-	-	-	-	-	-	-	-	<1	<0.1	<1	<1	<1	<0.1	<1	<5
TB	11/06/2021	Trip blank	-	-	-	-	<0.1	<0.1	<0.1	<0.3	-	-	-	-	-	-	-	-
TS		Trip spike	-	-	-	-	[103%]	[98%]	[96%]	[96%]	-	-	-	-	-	-	-	-
Groundwater Assessment																		
BH101M	18/06/2021	Groundwater	<50	180	<500	<500	<0.5	<0.5	<0.5	2.7	<1	0.1	5	14	2	<0.1	470	130
GWQD1		Intra-lab Duplicate	<50	<60	<500	<500	<0.5	<0.5	<0.5	2.6	<1	0.2	5	15	2	<0.1	450	130
		RPD	0.00	100.00	0.00	0.00	0.00	0.00	0.00	3.77	0.00	66.67	0.00	6.90	0.00	0.00	4.35	0.00
BH101M	18/06/2021	Groundwater	<50	180	<500	<500	<0.5	<0.5	<0.5	2.7	<1	0.1	5	14	2	<0.1	470	130
GWQT1		Inter-lab Duplicate	40	90	<100	<100	<1	<1	<1	<4	<1	0.1	8	17	2	<0.05	530	130
		RPD	22.22	66.67	NA	NA	NA	NA	NA	38.81	0.00	0.00	46.15	19.35	0.00	NA	12.00	0.00

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

0.00	RPD calculated by halving detection limit exceeds 30-50% range referenced from AS4482.1 (2005)
80.00	RPD exceeds 30-50% range referenced from AS4482.1 (2005)

Appendix L – Laboratory QA/QC Policies and
DQOs

Table QC1 - Containers, Preservation Requirements and Holding Times - Soil			
Parameter	Container	Preservation	Maximum Holding Time
Acid digestible metals and metalloids - Total and TCLP (As,Cd.,Cu,Cr,Ni,Pb,Zn)	Glass with Teflon Lid	Nil	6 months
Mercury	Glass with Teflon Lid	Nil	28 days
TPH / BTEX / VOC / SVOC / CHC	Glass with Teflon Lid	4°C, zero headspace	14 days
PAHs (total and TCLP)	Glass with Teflon Lid	4°C ¹	14 days
Phenols	Glass with Teflon Lid	4°C ¹	14 days
OCPs, OPPs and total PCBs	Glass with Teflon Lid	4°C ¹	14 days
Asbestos	Sealed Plastic Bag	Nil	N/A

Table QC2 - Containers, Preservation Requirements and Holding Times - Water			
Parameter	Container Volume (mL)	Preservation	Maximum Holding Time
Heavy Metals	125mL Plastic	Field filtration 0.45µm HNO ₃ / 4°C	6 months
Cyanide	125mL Amber Glass	pH > 12 NaOH / 4°C	6 months
TPH (C6-C9) / BTEX / VOCs SVOCs / CHCs	4 x 43mL Glass	HCl / 4°C ¹	14 days
TPH (C10-C36) / PAH / Phenolics OCP / OPP / TDS / pH	3 x 1L Amber Glass	None / 4°C ¹	28 days

Notes: ¹ = Extraction within 14 days, Analysis within 40 days.

Table QC3 - Analytical Parameters, PQLs and Methods - Soil			
Parameter	Unit	PQL	Method Reference
Metals in Soil			
Arsenic - As ¹	mg / kg	1	USEPA 200.7
Cadmium - Cd ¹	mg / kg	0.5	USEPA 200.7
Chromium - Cr ¹	mg / kg	1	USEPA 200.7
Copper - Cu ¹	mg / kg	1	USEPA 200.7
Lead - Pb ¹	mg / kg	1	USEPA 200.7
Mercury - Hg ²	mg / kg	0.1	USEPA 7471A
Nickel - Ni ¹	mg / kg	1	USEPA 200.7
Zinc - Zn ¹	mg / kg	1	USEPA 200.7
Total Petroleum Hydrocarbons (TPHs) in Soil			
C ₆ -C ₉ fraction	mg / kg	25	USEPA 8260
C ₁₀ -C ₁₄ fraction	mg / kg	50	USEPA 8000
C ₁₅ -C ₂₈ fraction	mg / kg	100	USEPA 8000
C ₂₉ -C ₃₆ fraction	mg / kg	100	USEPA 8000
BTEX in Soil			
Benzene	mg / kg	1	USEPA 8260
Toluene	mg / kg	1	USEPA 8260
Ethylbenzene	mg / kg	1	USEPA 8260
m & p Xylene	mg / kg	2	USEPA 8260
o- Xylene	mg / kg	1	USEPA 8260
Other Organic Contaminants in Soil			
PAHs	mg / kg	0.05-0.2	USEPA 8270
CHCs	mg / kg	1	USEPA 8260
VOCs	mg / kg	1	USEPA 8260
SVOCs	mg / kg	1	USEPA 8260
OCPs	mg / kg	0.1	USEPA 8140, 8080
OPPs	mg / kg	0.1	USEPA 8140, 8080
PCBs	mg / kg	0.1	USEPA 8080
Phenolics	mg / kg	5	APHA 5530
Asbestos			
Asbestos	mg / kg	Presence / Absence	AS4964-2004

Notes:

1. Acid Soluble Metals by ICP-AES
2. Total Recoverable Mercury

Table QC4 - Analytical Parameters, PQLs and Methods - Groundwater

Parameter	Unit	PQL	Method	Parameter	Unit	PQL	Method
Heavy Metals				Chlorinated Hydrocarbons (CHCs)			
Antimony - Sb	µg/L	1	USEPA 200.8	1,2-dichlorobenzene	µg/L	1	USEPA 8260B
Arsenic - As	µg/L	1	USEPA 200.8	1,3-dichlorobenzene	µg/L	1	USEPA 8260B
Beryllium - Be	µg/L	0.5	USEPA 200.8	1,4-dichlorobenzene	µg/L	1	USEPA 8260B
Cadmium - Cd	µg/L	0.1	USEPA 200.8	1,2,3-trichlorobenzene	µg/L	1	USEPA 8260B
Chromium - Cr	µg/L	1	USEPA 200.8	1,2,4-trichlorobenzene	µg/L	1	USEPA 8260B
Cobalt - Co	µg/L	1	USEPA 200.8	Hexachlorobutadiene	µg/L	1	USEPA 8260B
Copper - Cu	µg/L	1	USEPA 200.8	1,1,2-trichloroethane	µg/L	1	USEPA 8260B
Lead - Pb	µg/L	1	USEPA 200.8	Hexachloroethane	µg/L	10	USEPA 8270D
Mercury - Hg	µg/L	0.5	USEPA 7471A	Other CHCs	µg/L	1	USEPA 8260B
Molybdenum - Mo	µg/L	1	USEPA 200.8	Volatile Organic Compounds (VOCs)			
Nickel - Ni	µg/L	1	USEPA 200.8	Aniline	µg/L	10	USEPA 8260B
Selenium - Se	µg/L	1	USEPA 200.8	2,4-dichloroaniline	µg/L	10	USEPA 8260B
Silver - Ag	µg/L	1	USEPA 200.8	3,4-dichloroaniline	µg/L	10	USEPA 8260B
Tin (inorg.) - Sn	µg/L	1	USEPA 200.8	Nitrobenzene	µg/L	50	USEPA 8260B
Nickel - Ni	µg/L	1	USEPA 200.8	2,4-dinitrotoluene	µg/L	50	USEPA 8260B
Zinc - Zn	µg/L	1	USEPA 200.8	2,4,6-trinitrotoluene	µg/L	50	USEPA 8260B
Total Petroleum Hydrocarbons (TPHs)				Phenolic Compounds			
C ₆ -C ₉ fraction	µg/L	10	USEPA 8220A / 8000	Phenol	µg/L	10	USEPA 8041
C ₁₀ -C ₁₄ fraction	µg/L	50	USEPA 8000	2-chlorophenol	µg/L	10	USEPA 8041
C ₁₅ -C ₂₈ fraction	µg/L	100	USEPA 8000	4-chlorophenol	µg/L	10	USEPA 8041
C ₂₉ -C ₃₆ fraction	µg/L	100	USEPA 8000	2, 4-dichlorophenol	µg/L	10	USEPA 8041
BTEX				2,4,6-trichlorophenol	µg/L	10	USEPA 8041
Benzene	µg/L	1	USEPA 8220A	2,3,4,6-tetrachlorophenol	µg/L	10	USEPA 8041
Toluene	µg/L	1	USEPA 8220A	Pentachlorophenol	µg/L	10	USEPA 8041
Ethylbenzene	µg/L	1	USEPA 8220A	2,4-dinitrophenol	µg/L	10	USEPA 8041
m- & p-Xylene	µg/L	2	USEPA 8220A	Miscellaneous Parameters			
o-Xylene	µg/L	1	USEPA 8220A	Total Cyanide	µg/L	5	APHA 4500C&E-CN
Polycyclic Aromatic Hydrocarbons (PAHs)				Fluoride	µg/L	10	APHA 4500 F-C
PAHs	µg/L	0.1	USEPA 8270	Salinity (TDS)	mg/L	1	APHA 2510
Benzo(a)pyrene	µg/L	0.01	USEPA 8270	pH	units	0.1	APHA 4500H+
OrganoChlorine Pesticides (OCPs)				OrganoPhosphate Pesticides (OPPs)			
Aldrin	µg/L	0.001	USEPA 8081	Azinphos Methyl	µg/L	0.01	USEPA 8141
Chlordane	µg/L	0.001	USEPA 8081	Chloropyrifos	µg/L	0.01	USEPA 8141
DDT	µg/L	0.001	USEPA 8081	Diazinon	µg/L	0.01	USEPA 8141
Dieldrin	µg/L	0.001	USEPA 8081	Dimethoate	µg/L	0.01	USEPA 8141
Endosulfan	µg/L	0.001	USEPA 8081	Fenitrothion	µg/L	0.01	USEPA 8141
Endrin	µg/L	0.001	USEPA 8081	Malathion	µg/L	0.01	USEPA 8141
Heptachlor	µg/L	0.001	USEPA 8081	Parathion	µg/L	0.01	USEPA 8141
Lindane	µg/L	0.001	USEPA 8081	Temephos	µg/L	0.01	USEPA 8141
Toxaphene	µg/L	0.001	USEPA 8081	Polychlorinated Biphenyls (PCBs)			
				Individual PCBs	µg/L	0.01	USEPA 8081

Table QC5 - QC Sample Data Acceptance Criteria

QC Sample Type	Method of Assessment	Acceptable Range
Field QC		
Blind Duplicates and Split Samples	<p>The assessment of split duplicate is undertaken by calculating the Relative Percent Difference (RPD) of the duplicate concentration compared with the primary sample concentration. The RPD is defined as:</p> $RPD = 100 \times \frac{ X_1 - X_2 }{\text{mean}(X_1, X_2)}$ <p>Where: X₁ and X₂ are the concentrations of the primary and duplicate samples.</p>	<p>The acceptable range depends upon the levels detected:</p> <ul style="list-style-type: none"> - 0-150% RPD (when the average concentration is <5 times the LOR/PQL) - 0-75% RPD (when the average concentration is 5 to 10 times the LOR/PQL) - 0-50% RPD (when the average concentration is >10 times the LOR/PQL)
Rinsate & Trip Blanks	Each blank is analysed as per the original samples.	Analytical Result <LOR/PQL
Laboratory prepared Trip Spike	The Trip Spike is analysed after returning from the field and the % recovery of the known spike is calculated.	70 - 130%
Laboratory QC		
Laboratory Duplicates	Assessment of Lab Duplicate RPD as per Blind Duplicates and Split Samples.	Lab Duplicate RPD < 15% (Inorganics) Lab Duplicate RPD < 30% (Organics) for sample results > 10 LOR
Surrogates Matrix Spikes Laboratory Control Samples	<p>Assessment is undertaken by determining the percent recovery of the known surrogate spike (SS) or addition to the sample.</p> $\% \text{ Recovery} = 100 \times \frac{C - A}{B}$ <p>Where: A = Concentration of analyte determined in the original sample; B = Added Concentration; and C = Calculated Concentration.</p>	<p>at least 2 SS recoveries to be within 70-130% subject to matrix effects (Organics)</p> <p>80-120% (Inorganics / Metals) 60-140% (Organics) 10-140% (SVOC and Speciated Phenols)</p> <p>If the result is outside the above ranges, the result must be <3x Standard Deviation of the Historical Mean (calculated over the past 12 months).</p>
Sample Matrix Spike Duplicates	Recovery RPD	<30% (Inorganics & Organics)
Calibration Check Standards	Continuous Calibration Verification (CCV)	CCV must be within ±15% (inorganics) CCV must be within ±25% (inorganics)
Reagent, Method & Calibration Check Blanks	Each blank is analysed as per the original samples.	Analytical Result <LOR/PQL
<p>Note: PQL - Laboratory Practical Quantitation Limit (PQL) or the minimum detection limit for a particular analyte. LOR = Limit of Reporting</p>		

SGS Environmental Services is accredited by NATA for Chemical Testing (Reg.No.2562) and Quality System compliance to ISO/IEC 17025. The QC parameters contained within are designed to meet NEPM 1999 requirements.

Quality Control samples included in any analytical run are listed below.

Reagent/Analysis Blank (BLK) Method Blank (MB)	<p>Sample free reagents carried through the preparation/extraction/digestion procedure and analysed at the beginning of every sample batch analysis. A reagent blank is prepared and analysed with every batch of samples plus with each new batch of solvent prior to use.</p>
Sample Matrix Spike (MS) & Matrix Spike Duplicate (MSD)	<p>Sample replicates spiked with identical concentrations of target analyte(s). The spiking occurs during the sample preparation and <u>prior to the extraction/digestion procedure</u>. They are used to document the precision and bias of a method in a given sample matrix. Where there is not enough sample available to prepare a spiked sample, another known soil/sand or water may be used. A duplicate spiked sample is analysed at least every 20 samples.</p>
Surrogate Spike (SS)	<p>At least one but up to three surrogate compounds are added to all samples requiring analysis for organics prior to extraction. Used to determine the extraction efficiency. They are organic compounds which are similar to the target analyte(s) in chemical composition and behaviour in the analytical process, but which are not normally found in environmental samples. Where possible they are surrogate compounds recommended by the USEPA.</p>
Control Matrix Spike (CMS)	<p>To ensure spike recoveries can be determined for every batch of samples a control matrix is spiked with identical concentrations of target analyte(s) and then analysed. These results allow recoveries to be determined in the event that the matrix spikes are unusable (eg. matrix spikes performed on heavily contaminated samples). These are analysed at least every 20 samples.</p>
Internal Standard (IS)	<p>Added to all samples requiring analysis for organics (where relevant) after the extraction process; the compounds serve to give a standard of retention time and response, which is invariant from run-to-run with the instruments. Where possible they are standard compounds recommended by the USEPA.</p>
Lab Duplicates (D)	<p>A separate portion of a sample being analysed that is treated the same as the other samples in the batch. One duplicate is processed at least every 10 samples.</p>
Lab Control Standards/Samples (LCS)	<p>Prepared from a source independent of the calibration standards. At least one control standard is included in each run to confirm calibration validity. Thereafter they are analysed at least every one in 20 samples plus at the end of each analytical run. This data is not reported.</p>
Continuous Calibration Verification (CCV) or Calibration Check Standard & Blank	<p>A calibration check standard or CCV and blank are run after every 20 samples of an instrumental analysis run to assess analytical drift. Calibration Standards are checked old versus new with a criteria of $\pm 10\%$</p>

Quality Assurance Programs are listed below:

<p>Statistical analysis of Quality Control data (SQC)</p>	<p>Quality control data is plotted on control charts using the APHA procedure with warning and control limits at 2 and 3 standard deviations respectively. See also QMS Procedure "Statistical Quality Control".</p>
<p>Certified Reference Materials (CRM/SRM)</p>	<p>Certified Reference Materials and Standards are regularly analysed. These materials/standards have certified reference values for various parameters.</p>
<p>Proficiency Testing</p>	<p>Regular proficiency test samples are analysed by our laboratories. SGS Environmental participates in a number of programs. Results and proficiency status are compiled and sent to participating laboratory post data interpretation. Failure to comply with acceptable values result in further investigations.</p>
<p>Inter-laboratory & Intra-laboratory Testing</p>	<p>SGS Environmental Services has schedules in the Quality Systems to participate in Inter/Intra laboratory testing conducted internally and by other parties.</p>
<p>Data Acceptance Criteria</p> <p>Unless otherwise specified in the method or method manual the following general criteria apply to all inorganic tests.</p> <p>All recoveries are to be reported to 3 significant figures.</p>	<p>Failure to meet the internal acceptance criteria will result in sample batch repeats dependent upon investigation outcomes. For data to be accepted:</p> <p><u>Inorganics (water samples)</u></p> <ul style="list-style-type: none"> • For all inorganic analytes the Reagent & Method Blanks must be less than the LOR. • The Calibration Check Standards or Continuous Calibration Verification (CCV) must be within $\pm 15\%$. • Control Standards must be 80-120% of the accepted value. • The Calibration Check Blanks must be less than the LOR. • Lab Duplicates RPD to be $<15\%$*. Note: If client <u>field</u> duplicates do not meet this criteria it may indicate heterogeneity and shall be noted on the data reports for QC samples. • Sample (and if applicable Control) Matrix Spike^d Duplicate recovery RPD to be $<30\%$. • Where CRMs are used, results to be within ± 2 standard deviations of the expected value. <p><u>Inorganics (soil samples)</u></p> <ul style="list-style-type: none"> • For all inorganic analytes the Reagent & Method Blanks must be less than the LOR. • The Calibration Check Standards or Continuous Calibration Verification (CCV) must be within $\pm 15\%$. • Control Standards must be 80-120% of the accepted value. • The Calibration Check Blanks must be less than the LOR. • Lab duplicate RPD to be $<30\%$* for sample results greater than 10 times LOR. • Sample Matrix Spike Duplicate (MS^d/MSD) recovery RPD to be $<30\%$. In the event that the matrix spike has been applied to samples whose matrix or contamination is problematic to the method then these acceptance criteria apply to the Control Matrix Spike (CMS/D). • Where CRMs are used, results to be within ± 2 standard deviations of the expected value.

<p>Data Acceptance Criteria</p> <p>Unless otherwise specified in the method or method manual the following general criteria apply to all organic tests.</p> <p>All recoveries are to be reported to 3 significant figures.</p>	<p><u>Organics</u></p> <ul style="list-style-type: none"> • Volatile & extractable Reagent & Method Blanks must contain levels less than or equal to LOR. • The Calibration Check Standards or Continuous Calibration Verification (CCV) must be within $\pm 25\%$. Some analytes may have specific criteria. • Control Standards (LCS/CMS) and Certified Reference Materials (CRM) recoveries are to be within established control limits or as a default 60-140% unless compound specific limits apply. • Retention times are to vary by no more than 0.2 min. • At least two of three routine level soil sample Surrogate Spike (SS) recoveries 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 acceptance criterion. Any recoveries outside these limits will have comment. • Water sample Surrogates Spike (SS) recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion. Any recoveries outside these limits will have comment. • Lab Duplicates (D) must have a RPD $<30\%^*$. • Sample Matrix Spike Duplicate (MS^d/MSD) recovery RPD to be $<30\%$. In the event that the matrix spike has been applied to samples whose matrix or contamination is problematic to the method then these acceptance criteria apply to the Control Matrix Spike (CMS/D).
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*Only if results are at least 10 times the LOR otherwise no acceptance criteria for RPD's apply. Application of more stringent criteria shall be applied for clean water sample from water boards and any other nominated client contracts. Nominal 10xLOR criteria are dropped to 5xLOR where specified.

^dMatrix do not readily equate to definitive recovery due to inherent matrix interferences and thus do not have recovery compliance values set. As a guide inorganic recoveries should be between 70-130% and for organics 60-130%

Batch Structure Summary

An analytical batch is nominally considered as 20 samples or smaller. As a standard template the following should be **used as a guide** according to the above Quality Control Types:

1	MB	16	UNK_DUP
2	STD1	17	MS
3	STD2	18	MS_DUP
4	STD3	19	UNK 11
5	LCS	20	UNK 12
6	BLK	21	UNK 13
7	UNK 1	22	UNK 14
8	UNK 2	23	UNK 15
9	UNK 3	24	UNK 16
10	UNK 4	25	UNK 17
11	UNK 5	26	UNK 18
12	UNK 6	27	UNK 19
13	UNK 7	28	UNK 20 (SS if applicable)
14	UNK 8	29	UNK_DUP
15	UNK 9	30	CCV
16	UNK 10 (SS if applicable)	31	CRM / SRM / CMS / LCS