BIMIOBA INVESTMENTS TRUST C/- WILLANA ASSOCIATES

DETAILED SITE INVESTIGATION
PROPOSED RESIDENTIAL DEVELOPMENT
37 - 39 PAVESI STREET, GUILDFORD WEST NSW

Report E22817 AA_Rev0
20 January 2016

Environmental Investigations Australia
Contamination | Remediation | Geotechnical

REPORT DISTRIBUTION

Detailed Site Investigation
Proposed Residential Development
37 - 39 Pavesi Street, Guildford West NSW

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EXECUTIVE SUMMARY

Background

Bimioba Investments Trust c/- Willana Associates engaged Environmental Investigations Australia Pty Ltd (EI) to conduct a Detailed Site Investigation (Stage 2 DSI) for the former commercial / industrial property located at 37 - 39 Pavesi Street, Guildford West NSW ('the site'). This environmental assessment was completed as part of a development application process through Holroyd Council to allow site development for low density residential land use.

Based on a previous Stage 1 Preliminary Site Investigation undertaken by Consulting Earth Scientists in August, 2014, the site was historically industrial and commercial in nature.

Objectives

The main objectives of the assessment were to:

- Characterise site environmental conditions in relation to the nature, degree and sources of any soil, vapour and groundwater impacts;
- Target potentially impacted areas identified during the preliminary stages of the assessment for intrusive investigation;
- Understand the influence of site specific, geologic and hydrogeological conditions on the potential fate and transport of any impacts that may be identified;
- Evaluate potential risks that identified impacts may pose to human health and the environment; and
- Where site contamination is confirmed, provide data to assist in the selection and design of appropriate remedial options.

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 and surrounding areas have a mixed history of industrial and commercial land use;
- A previous environmental assessment was undertaken for Lot 36 DP10958 in 2007 by WSP Environmental Pty Ltd. This investigation identified that the site was previously used as a chemical blending facility. Two USTs were used to store kerosene (30,000 L) and diesel (12,000 L). In addition, three redundant USTs were also identified, located close to the eastern boundary, of which were installed by a trucking company who operated the site during the 1960s and 1970s. Anecdotal evidence from site representatives reported that the USTs were decommissioned and filled with water in the 1980s;
- Potentially contaminating land use activities that were identified included:
  - Application of uncontrolled fill on the site;

  - Storage of chemicals on site associated with former manufacturing processes that took place (i.e. chemical blenders);
  - Leakages and surface spills associated within manufacturing processes on site;
  - Storage of fuels within the USTs and associated pipe work / fuel lines throughout the warehouse/site; and
  - Demolition of former site structures possibly constructed from hazardous building materials.

- Soil sampling and analysis was conducted at nineteen (19) targeted test bore locations identified surface layers comprised of fill materials of various constituents, underlain by residual clays, with the Bringelly Shale at depth;
- Boreholes BH104M, BH106M and BH117M were converted to groundwater monitoring bores, and groundwater was encountered at depths ranging from 5.0 – 5.2 mBGL within the weathered Bringelly Shale;
- Results of soil samples analysed identified bonded and fibrous asbestos in surface fill samples at boreholes BH117 and BH118 located within the south western portion of the site, and indicated that asbestos contamination is likely to be confined to upper fill layers. This is consistent with observations made within the vicinity of these boreholes, which included crushed asbestos fibro pieces distributed throughout the gravelled car-park area located in the south western corner of the site;
- Exceedances of heavy metals above the adopted EIL criteria were detected in soil samples at four borehole locations across the site;
- F2 (>C_{10}-C_{16})) TRH fraction above the HSL A&B and ESL criteria was identified in soil sample BH114_1.0-1.1 (510 mg/kg). BH114 was not located within close vicinity of the known UPSS tank farm, therefore indicating the potential for an additional UPSS or unknown source of TRH to be present on site;
- Hydrocarbon odours were observed in soil sample at test boreholes BH106 (0.5 – 2.0 mBGL), BH109 (from 0.2 – 0.9 mBGL), BH111 (from 0.5 – 1.8 mBGL) and BH115 (from 0.2 – 0.6 mBGL). Although no elevated TRH concentrations were detected in soil samples analysed from these boreholes, the source of the odour is unknown; and
- Elevated concentrations of heavy metals were detected in groundwater monitoring wells BH104M, BH106M and BH117M. Based on the inferred groundwater flow direction to the east, the presence of elevated background heavy metal concentrations within groundwater indicates that high metal concentrations may be attributable to an offsite source.

The following data gaps however remain and require closure by further investigations:

- The spatial extent of asbestos, TRH and heavy metal contamination exceeding adopted human-health and ecological criteria at boreholes identified;
- Further investigation is required to identify the source of hydrocarbon contamination at BH114 and staining and odours identified at BH109, BH111, and BH115;
- Further investigation is required to establish the number of UPSS on site and to identify any additional UPSS and pipework;

- Groundwater quality in proximity to BH114 with regard to potential hydrocarbon contamination of groundwater;
- Confirmation of groundwater flow direction by the surveying of each individual well at the site;
- Confirmation of reported heavy metal concentrations in groundwater and verification of an offsite source of groundwater contamination;
- The quality of soils located in the footprint of the former residential dwelling located within the southern portion of the site; and
- Potential presence of hazardous materials present within the existing structure.

Conclusions and Recommendations

Based on the findings of this report, EI conclude that contamination was identified at the site during this DSI, however, can be made suitable to allow the site to be used for low density residential purposes, subject to the implementation of the following recommendations:

- Prior to site demolition, carry out a Hazardous Materials Survey on existing site structures to identify potentially hazardous building products that may be released to the environment during demolition;
- Preparation and implementation of a Remedial Action Plan (RAP), which should:
  - Outline the remediation requirements for soil and groundwater contamination identified and to close the existing data gaps identified during this DSI;
  - Provide methodology for the appropriate decommissioning, removal and validation of the UPSS on site;
  - Provide the requirements and procedure for waste classification assessment, in order to enable classification of site soils to be excavated and disposed off-site; and
  - Provide a SAQP for the validation of remediation activities performed on-site.
- Undertake supplementary investigations, and remediation and validation works for the site, as outlined in the RAP; and
- Preparation of a validation report by a suitably qualified environmental consultant, certifying site suitability of soils and groundwater for the proposed land use.

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1. INTRODUCTION

1.1 BACKGROUND AND PURPOSE

Bimioba Investments Trust c/- Willana Associates (the Client) engaged Environmental Investigations Australia Pty Ltd (EI) to conduct a Detailed Site Investigation (DSI) for site characterisation purposes for the Proposed Residential Development, located at 37 - 39 Pavesi Street, Guildford West NSW ('the site').

As shown in Figure 1, the site is currently used as a commercial warehouse for the storage and distribution of rugs and is located approximately 23 km west of the Sydney central business district, comprising Lot 36 DP10958. The site is situated within the Local Government Area of Holroyd Council and covers a total area of approximately 8,050 m^2, as depicted in the site plan presented as Figure 2.

This assessment was conducted in support of a Development Application (DA) to Holroyd Council and for the purpose of enabling 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.

1.2 PROPOSED DEVELOPMENT

The proposed development will include the demolition of existing site structures and the construction of low density residential houses. The proposed subdivision and development plans are provided as Appendix A.

1.3 REGULATORY FRAMEWORK

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

- ANZECC & ARMCANZ (2000) Australian and New Zealand Guidelines for Fresh and Marine Water Quality;
- DECCW (2009) Guidelines for Implementing the Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2008, (UPSS Guidelines);
- DEC (2007) Guidelines for the Assessment and Management of Groundwater Contamination;
- DEC (2006) Guidelines for the NSW Site Auditor Scheme (2nd Edition);
- EPA (1995) Sampling Design Guidelines;
- EPA (2014) Technical Note: Investigation of Service Station Sites;
- NEPC (2013) Schedule B(1) Guideline on Investigation Levels for Soil and Groundwater;
- NEPC (2013) Schedule B(2) Guideline on Site Characterisation;
- OEH (2011) Guidelines for Consultants Reporting on Contaminated Sites.
- Contaminated Land Management Act (1997);
- State Environment Protection Policy 55 (SEPP 55) – Remediation of Land, and

- Holroyd Council Contaminated Land Policy 2001.

1.4 PROJECT OBJECTIVES

In accordance with the development application process, the proponent is required to undertake a detailed contamination assessment for any future development applications. The primary objectives of this investigation were therefore to:

- Characterise site environmental conditions in relation to the nature, degree and sources of any soil, vapour and groundwater impacts;
- Target potentially impacted areas identified during the preliminary stages of the assessment for intrusive investigation;
- Understand the influence of site specific, geologic and hydrogeological conditions on the potential fate and transport of any impacts that may be identified;
- Evaluate potential risks that identified impacts may pose to human health and the environment; and
- Where site contamination is confirmed, provide data to assist in the selection and design of appropriate remedial options.

1.5 SCOPE OF WORKS

In order to achieve the above objectives, and in accordance with EI proposal P13538.1 (dated 26 November 2015), the scope of works was as follows:

1.5.1 Desktop Study

- Review of previous Environmental reports undertaken for the site; and
- A review of existing underground services on site.

1.5.2 Field Work & Laboratory Analysis

- A detailed site walkover inspection;
- Drilling of boreholes at nineteen locations across accessible areas of the site, in accordance with the minimum sampling protocol recommended by EPA (1995);
- Installation of three groundwater monitoring wells to a maximum depth of 6.0 m (or prior refusal), constructed to standard environmental protocols to investigate potential groundwater contamination;
- Multiple level soil sampling within fill and natural soils and one round of groundwater sampling from the constructed groundwater monitoring well; 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

A DSI report would also be prepared to document desk study findings, the conceptual site model, data quality objectives, investigation methodologies and results. The report would also provide 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 Figure 1.

Table 2-1 Site Identification, Location and Zoning

Attribute	Description
Street Address	37 - 39 Pavesi Street, Guildford West NSW
Location Description	Approx. 23 km west of Sydney CBD, a rectangular shaped block bound by Pavesi Street (south), commercial / industrial properties (west), low residential dwellings (east) and bus way followed by low density residential dwellings (north). Northeast corner of site: GDA94-MGA55 Easting: 866477.461, Northing: 6248035.971 (Source: http://maps.six.nsw.gov.au)
Site Area	Approx. 8,050 m^2 (Source: http://maps.six.nsw.gov.au)
Site Owner	Bimioba Investments Trust c/- Willana Associates
Lot and Deposited Plan (DP)	Lot 36 DP10958
State Survey Marks	One State Survey Mark (SSM) are situated in close proximity to the site: SS165441 on the corner of Pavesi Street and Iris Street, south of the site (Source: http://maps.six.nsw.gov.au)
Local Government Authority	Holroyd Council
Parish	St John
County	Cumberland
Current Zoning	IN2 – light industrial (Holroyd Local Environment Plan, 2013)
Current Land Uses	Northern area – Large warehouse occupying the western, central portion with paved and gravelled areas across the northern and eastern areas. Southern Area – Former residential dwelling currently used as an office for the rug distribution centre, with an open, gravelled car park within the south western area.

At the time of this assessment the site was occupied by a large warehouse, former residential house which is currently being used as an office and open paved and gravelled areas. The current site layout is provided as Figure 2.

2.2 SURROUNDING LAND USE

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

Table 2-2 Surrounding Land Uses

Direction Relative to Site	Land Use Description
North	A bus way, followed by low density residential dwellings.
East	Low density residential dwellings.
South	Pavesi Street, followed by commercial and low density residential dwellings.
West	Commercial / light industrial properties.

The nearest sensitive receptors include residential houses located immediately east and north of the site, Guildford West Public School and Guildford West Children's Centre located approximately 640 m south east, Kids World kindergarten located approximately 706 m south east and Merrylands High School located 870 m north east.

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 site is generally flat, with a slight decline towards the south.
Site Drainage	Consistent with the general slope of the site, stormwater is assumed to flow south towards Prospect Creek via drainage systems discharging to various stormwater easements and the municipal stormwater system.
Regional Geology	With reference to the 1:100 000 scale Geological Series Sheet 9130 (Penrith) the site is likely to be underlain by Bringelly Shale (Rwb), a member of the Wianamatta Group, comprising of shale, carbonaceous claystone, claystone, laminite, fine to medium grained lithic sandstone, with rare coal and tuff.
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 overlies the Blacktown (bt) landscape. Typically consisting of gently undulating rises on Waianamatta Group Shales and Hawkesbury Shale with broad rounded crests and ridges with gently inclined slopes (<5%). Soils consist of shallow to moderately deep <1.5m red and brown podzolic soils on crests and upper slopes and in well drained.
Acid Sulphate Soil Risk	As the site is not considered to be an estuarine area, Holroyd Council and the NSW Department of Land and Water Conservation do not provide acid sulphate soil risk maps for the area. Instead, it is considered that the site within an area classified as "No Known Occurrence". In such cases, acid sulphate soils (ASS) are not known or expected to occur and land management activities are not likely to be affected by ASS materials.

Attribute	Description
Depth to Groundwater	Onsite groundwater conditions, including groundwater flow direction, are discussed in Section 8.2.
Nearest Surface Water Feature	Prospect Creek is located approximately 1.0 km south of the site and forms the nearest receiving surface water body in relation to the site and is classed as a fresh water ecosystem, for impact assessment purposes.
Groundwater Flow Direction	Groundwater flow direction in the vicinity of the site is inferred to be towards Prospect Creek located approximately 1.0 km south to south-west of the site.

2.4 Groundwater Bore Records and Local Groundwater Use

An online search of registered groundwater bores was conducted by EI on the 9 December 2015 through the NSW Office of Water (Ref. http:// realtimedata.water.nsw.gov.au/water.stm). There were no registered bores within a 500 m radius of the site.

2.5 Site Walkover Inspection

EI staff made a number of observations during a detailed site inspection on 8 December 2015 which included the following:

- The sites was occupied by a former residential house within the southern portion of the site, a large warehouse within the central portion and open, paved and grassed areas within the eastern and northern portions of the site (Photo 1 and Photo 2);
- The residential building consisted of brick and steel, while the warehouse consisted of a large brick and steel structure with corrugated asbestos sheeting ("super-six" sheeting) along the eastern external wall;
- The northern portion of the site was gravelled / asphalt with over-grown grass and vegetation. "Super-six" cement-fibre sheeting (potentially contaminating asbestos) was identified (Photo 3), along with smaller pieces of fragmented cement-fibre sheeting within a small stockpile (Photo 4). Two caravans, in average to poor condition were also present within this area of the site;
- A large, stockpile was present within north-eastern area of the site, this stockpile was overgrown with grass and trees, and contained various materials including bricks and fill (Photo 5);
- Two Underground Storage Tanks (USTs) were identified in the central western area of the site (Photo 6); and
- Fragments of cement-fibre sheeting were observed on the gravelled carpark located in the south-western corner of the site (Photo 7).

A detailed photo log is provided in Appendix B.

3. PREVIOUS INVESTIGATIONS

3.1 AVAILABLE DOCUMENTS

A previous environmental investigation in the form of a Phase 1 Environmental Site Assessment was conducted on the site and the adjoining western lot by Consulting Earth Scientists (CES) in August 2015. CES documented their findings in a report titled Phase 1 Environmental Site Assessment Report at 33-35 Pavesi Street, Guildford West, NSW (Ref. CES Report ID. CES150703-BIM-AC, 3 August 2015), which provided an overall indication of contamination for the proposed development. A summary of CES' works and key findings is outlined in Table 3-1.

Table 3-1 Summary of Previous Investigation Works and Findings

Assessment Details	Project Tasks and Findings
Phase 1 Environmental Site Assessment (CES, 2015)	
Work Objectives	To assess the potential for contamination that may have arisen from past and / or present activities undertaken on and / or adjacent to the site.
Scope of Works	• Identification of the site, including location, address, boundaries, zoning and title descriptions; • Comprehensive research to enable documentation of the site history and assessment of potential sources of contamination; • Completion of an underground services search; • A site inspection to visually identify potential sources of contamination; and • Preparation of a Phase 1 ESA report.
Conclusions	The results of the Phase 1 ESA indicated that the site and surrounding areas have a mixed history of industrial and commercial land use. A previous environmental assessment was undertaken for Lot 36 DP10958 in 2007 by WSP Environmental Pty Ltd. This investigation identified that the site was previously used as a chemical blending facility. Two USTs were used to store kerosene (30,000 L) and diesel (12,000 L). In addition, three redundant USTs were also identified, located close to the eastern boundary, of which were installed by a trucking company who operated the site during the 1960s and 1970s. Anecdotal evidence from site representatives reported that the USTs were decommissioned and filled with water in the 1980s. Potentially contaminating land use activities that were identified included: • Application of uncontrolled fill on the site; • Storage of chemicals on site associated with former manufacturing processes that took place (i.e. chemical blenders); • Leakages and surface spills associated within manufacturing processes on site; • Storage of fuels within the USTs and potential localised contamination associated with fuel lines used to distribute fuel into process areas within the warehouse; and • Demolition of former site structures possibly constructed from hazardous building materials.
Recommendations	Carry out an investigation of the soil and groundwater at the site; and Removal and excavation of USTs and surrounding soils as part of the proposed development. A programme of soil and groundwater validation within the vicinity of the tanks will be required as part of these works.

3.2 SUMMARY OF CONTAMINATION

In summary, as described above, the following potential sources of contamination identified at the site were identified during the previous Stage 1 ESA:

- Application of uncontrolled fill on the site;
- Storage of chemicals on site associated with former manufacturing processes that took place (i.e. truck bodies and chemical blenders);
- Leakages and surface spills associated within manufacturing processes on site;
- Storage of fuels within the USTs and along associated fuel lines; and
- Demolition of former site structures possibly constructed from hazardous building materials.

4. 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 preliminary 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.

4.1 CHEMICAL HAZARDS AND CONTAMINATION SOURCES

On the basis of site history and search findings (described in Section 5) EI consider potential chemical hazards and onsite contamination sources to be as follows:

- Imported fill soils of unknown origin distributed across the site;
- Impacts from previous light industrial manufacturing activities at the site including the former manufacturing activities (i.e. chemical blenders);
- Painted surfaces in relation to the structures (buildings) that are currently present on the site;
- Hazardous materials, including potential asbestos-containing materials (ACM) from building products;
- Potential leakages and surface spills associated with the manufacturing processes previously undertaken on site;
- Storage of fuels within USTs on the site and localised contamination associated with fuel lines; and
- Deeper, natural soils containing residual impacts, representing potential secondary sources of contamination.

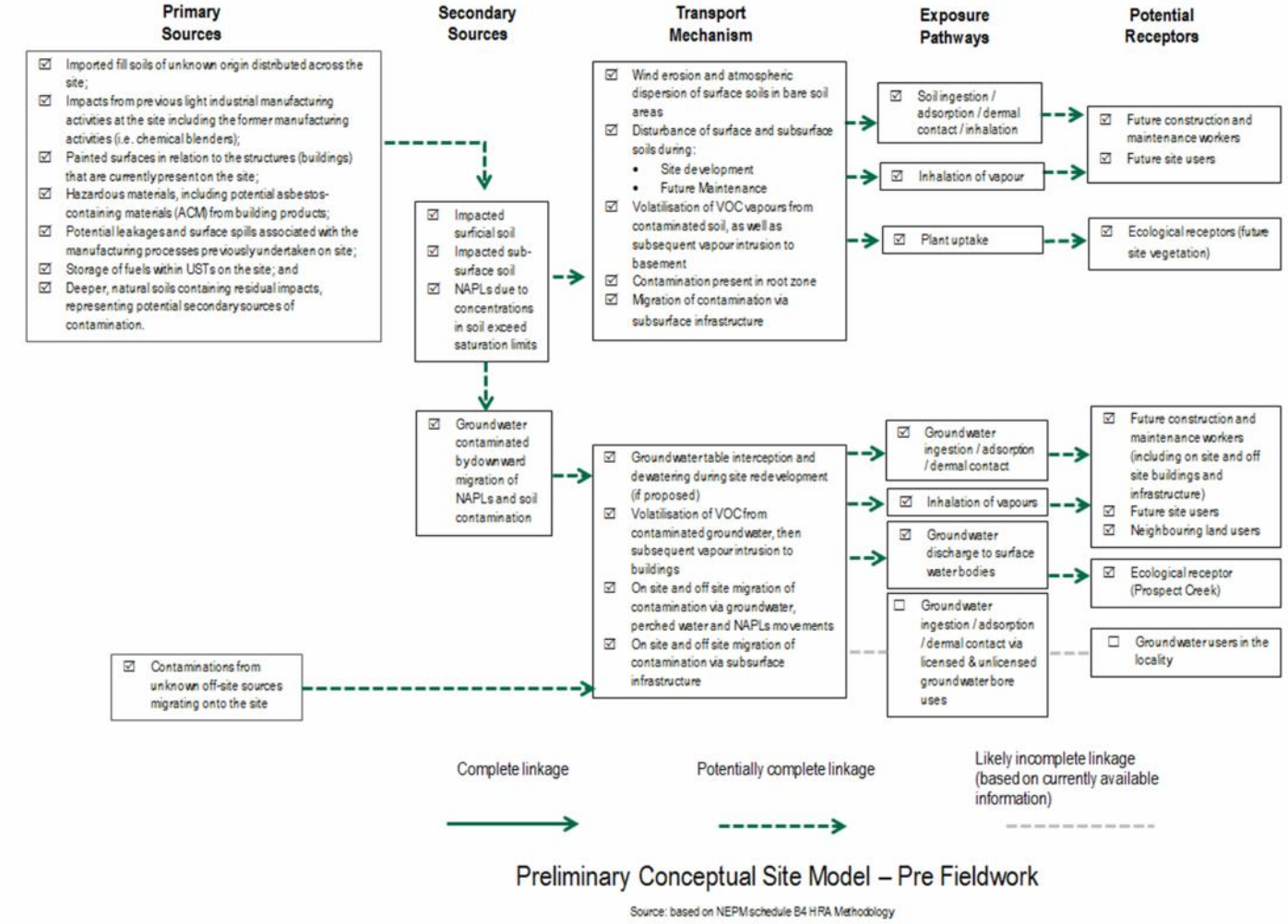
4.2 CHEMICALS OF CONCERN

Based on the findings of the site contamination appraisal the chemicals of concern (COC) at the site are considered to be:

- Soil – heavy metals (HMs), total recoverable hydrocarbons (TRH), polycyclic aromatic hydrocarbons (PAH), monocyclic aromatic hydrocarbon 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), including chlorinated VOC (VOCC) such as trichloroethylene (TCE).

4.3 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 Figure 4-1.



Preliminary Conceptual Site Model – Pre Fieldwork

Source: based on NEPM schedule B4 HRA Methodology

Figure 4-1 Pre-fieldwork Preliminary Conceptual Site Model

4.4 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.

5. SAMPLING, ANALYTICAL AND QUALITY PLAN (SAQP)

The SAQP plays a crucial role in ensuring that the data collected as part of this, and ongoing environmental works carried out at the site are representative, and provide a robust basis for site assessment decisions. This 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.

5.1 DATA QUALITY OBJECTIVES (DQO)

In accordance with the USEPA (2006) Data Quality Assessment and the DEC (2006) 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 Table 5-1.

Table 5-1 Summary of Project Data Quality Objectives

DQO Steps (NSW DEC, 2006)	Details	Comments (changes during investigation)
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	• The site is to be redeveloped for low-density residential housing, with accessible soil areas. • Historical information and site inspection identified the potential for contamination to be present in site soil and/or groundwater, contributed by various potential sources listed in Section 4.1. Based on the site history information collected, a preliminary conceptual site model of the site has been developed, and is present in Section 4. • The investigation sampling must provide supportive information on the environmental conditions of the site to determine the site's suitability for the proposed development.	
2. Identify the Goal of the Study (Identify the decisions) Identify the decisions that need to be made on the contamination problem and the new environmental data required to make them	Based on the objectives outlined in Section 1.4, the decisions that need to be made are: • Has the nature, extent and source of any soil, vapour and/or groundwater impacts onsite been defined? • What impact do the site specific, geologic and hydrogeological conditions have on the fate and transport of any impacts that may be identified? • Does the level of impact coupled with the fate and transport of identified contaminants represent an unacceptable risk to identified human and/or environmental receptors on or offsite? • Does the collected data provide sufficient information to allow the selection and design of an appropriate remedial strategy, if necessary?	
3. Identify Information Inputs (Identify inputs to decision) Identify the information needed to support any decision and specify which inputs require new environmental measurements	Inputs to the decision making process include: • Site history information from the previous CES (2015) investigation; • Areas of concern identified by CES (2015) and during the site inspection prior to intrusive investigations; • National and NSW EPA guidelines under the NSW Contaminated Land Management Act 1997; • Investigation sampling to verify the presence of onsite contamination and to evaluate the potential risks to sensitive receptors; • Laboratory analysis of selected soil and groundwater samples will comprise contaminants of concern presented in Section 4.2; and • At the end of the assessment, a decision must be made regarding whether the soils and groundwater are suitable for the proposed development, or if additional investigation or remedial works are required to make the site suitable.	Due to an impenetrable object (possibly concrete), deeper fill soils and natural soils could not be assessed at test location BH119.

DQO Steps (NSW DEC, 2006)	Details	Comments (changes during investigation)
4. Define the Boundaries of the Study Specify the spatial and temporal aspects of the environmental media that the data must represent to support decision	• Lateral – The investigation will be conducted within the cadastral site boundaries; which defines the extent of the investigation • Vertical – From existing ground surface, underlying fill and natural soil horizons, to underlying groundwater water-bearing zone(s); and • Temporal – The results will be valid on the day samples are collected and will remain valid as long as no changes occur on site or contamination (if present) does not migrate on site or on to the site from off-site sources.	
5. Develop the Analytic Approach (Develop a decision rule) To define the parameter of interest, specify the action level, and integrate previous DQO outputs into a single statement that describes a logical basis for choosing from alternative actions	The decision rules for the investigation were: • If the concentrations of contaminants in the soils data exceed the land use criteria; then assess the need to further investigate the extent of impacts onsite, and • Decision criteria for QA/QC measures are defined by the Data Quality Indicators (DQI) in Table 5-2.	

DQO Steps (NSW DEC, 2006)	Details	Comments (changes during investigation)
6. Specify Performance or Acceptance Criteria (Specify limits on decision errors) Specify the decision-maker's acceptable limits on decision errors, which are used to establish performance goals for limiting uncertainties in the data	Specific limits for this project are to be in accordance with the National and NSW EPA guidance, and appropriate indicators of data quality and standard procedures for field sampling and handling. This should include the following points to quantify tolerable limits: • The null hypothesis for the investigation is that: – The 95% Upper Confidence Limits (UCL) of the mean for contaminants of concern exceed residential (with accessible soil) land use criteria across the site. • Sampling on a 20.5 m grid will allow detection of a circular hotspot with a nominal diameter of 24 m with 95% certainty; • The acceptance of the site will be based on the probability that – The 95% UCL of the mean of the data will satisfy the given site criteria. Therefore a limit on the decision error will be 5% that a conclusive statement may be incorrect; and – The standard deviation of the results is less than 50% of the relevant remediation acceptance criterion; and – No single results exceeds the remediation acceptance criteria by 250% or more; and • Soil concentrations for chemicals of concern that are below investigation criteria made or approved by the NSW EPA will be treated as acceptable and indicative of suitability for the proposed land use(s); and • If contaminant concentrations in groundwater exceed the adopted criteria, further investigation will be considered prudent. If no contamination is detected in groundwater, further action will not be warranted.	
7. Develop the Detailed Plan for Obtaining Data (Optimise the design for obtaining data) Identify the most resource-effective sampling and analysis design for general data that are expected to satisfy the DQOs	• The site area (8,050 m^2) required nineteen sampling points according to EPA (1995); • Soil sampling locations were set using a systematic sampling pattern across the accessible areas of the site; • An upper soil profile sample (or soil extracted immediately beneath the concrete hardstand / pavement) will be collected at each borehole location and tested for chemicals of concern, to assess the conditions of fill layer, and impacts from activities above ground. Further sampling would also be carried out at deeper soil layers. These samples would be selected for testing based on field observations (including visual and olfactory evidence, as well as soil vapour screening in headspace samples) whilst giving consideration to characterise the subsurface stratigraphy; • Three groundwater monitoring wells were proposed to characterise groundwater quality within the site; and • Written instructions will be issued to guide field personnel in the required fieldwork activities.	

5.2 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 5-2, which related to both field and laboratory-based procedures. The assessment of data quality is discussed in Section 7.

Table 5-2 Data Quality Indicators

QA/QC Measures	Data Quality Indicators
Precision – A quantitative measure of the variability (or reproducibility) of data	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: • 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	Data accuracy would be assessed through the analysis of: • 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	To ensure the data produced by the laboratory is representative of conditions encountered in the field, the laboratory would carry out the following: • 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	Analytical data sets acquired during the assessment will be evaluated as complete, upon confirmation that: • 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. 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.
Comparability – The confidence (expressed qualitatively) that data may be considered to be equivalent for each sampling and analytical event	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. In addition the data will be collected by experienced samplers and NATA-accredited laboratory methodologies will be employed in all laboratory testing programs.

6. ASSESSMENT METHODOLOGY

6.1 SAMPLING RATIONALE

With reference to the preliminary CSM described in Section 4, soil and groundwater investigation works were planned in accordance with the following rationale:

- Sampling fill and natural soils from nineteen test bore locations located systematically across the site using a systematic triangular-based sampling pattern, and at targeted locations at/or adjacent to former onsite contamination sources (i.e. at the areas of the UST) to assess for the presence of residual soil contamination;
- Sampling groundwater during a single groundwater monitoring event (GME) at three monitoring wells located close to the up gradient and down gradient site boundaries and immediately down gradient of the UST area, to assess for potential groundwater contamination; and
- Laboratory analysis of representative soil and groundwater samples for the identified chemicals of concern.

6.2 INVESTIGATION CONSTRAINTS

The number of test bores drilled and monitoring wells installed during the investigation phase achieved the planned investigation scope described in the DQO (Section 5.1), however, the following investigation constraint was encountered:

- Borehole BH119 did not achieve the target depth of natural soils due to buried impenetrable materials which caused auger refusal.

6.3 ASSESSMENT CRITERIA

The assessment criteria proposed for this project are outlined in Table 6-1. 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 6-1 Adopted Investigation Levels for Soil and Groundwater

Environmental Media	Adopted Guidelines	Rationale
Soil	NEPM, 2013 Soil HILs, EILs, HSLs, ESLs & Management Limits for TPHs	Soil Health-based Investigation Levels (HILs) All soil samples to be assessed against the NEPM 2013 HIL-A thresholds for residential sites with gardens/accessible soils. Ecological Investigation Levels (EILs) Areas no basement excavation is proposed, all soil samples will be assessed against the NEPM 2013 EILs for arsenic, copper, chromium (III), nickel, lead, zinc, DDT and naphthalene which have been derived for protection of terrestrial ecosystems. Table 7-2 provides a summary of adopted Added Contaminant Levels (ACL) and Ambient Background Concentrations for the derivation of copper, chromium (III), nickel, lead, and zinc EILs. Generic EILs were adopted for ecological assessment in relation to arsenic, DDT and naphthalene. Soil Health-based Screening Levels (HSLs) The NEPM 2013 Soil HSL-A&B thresholds for low-high density residential sites for vapour intrusion would be applied to assess for potential human health impacts from residual vapours resulting from petroleum, BTEX & naphthalene. Soils asbestos results to be assessed against the NEPM 2013 Soil HSL thresholds for "all forms of asbestos". Ecological Screening Levels (ESLs) All soil samples to be assessed against the NEPM 2013 ESLs for selected petroleum hydrocarbons & TRH fractions for protection of terrestrial ecosystems. Management Limits for Petroleum Hydrocarbons Should the ESLs and HSLs be exceeded for petroleum hydrocarbons, soil samples would also be assessed against the NEPM 2013 Management Limits for the TRH fractions F1 – F4 to assess propensity for phase-separated hydrocarbons (PSH), fire and explosive hazards & adverse effects on buried infrastructure.
Groundwater	NEPM, 2013 GILs for Marine Waters NEPM, 2013 Groundwater HSLs for Vapour Intrusion NEPM, 2013 GILs for Drinking purposes	Groundwater Investigation Levels (GILs) for Marine Water NEPM 2013 provides GILs for typical, slightly-moderately disturbed aquatic ecosystems, which are based on the ANZECC & ARMCANZ 2000 Trigger Values (TVs) for the 95% level of protection of aquatic ecosystems; however, the 99% TVs were applied for the bio-accumulative metals cadmium and mercury. The fresh criteria were considered relevant as the closest, potential surface water receptor was Prospect Creek located approximately 1 km south of the site. Health-based Screening Levels (HSLs) The NEPM 2013 groundwater HSLs for vapour intrusion were used to assess for potential human health impacts from residual vapours resulting from petroleum, BTEX and naphthalene impacts. The HSL A and HSL B thresholds for low and medium-density residential sites were applied for groundwater.

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 9.

Table 7-2 Generic and Derived Ecological Investigation Levels

Metal	Assumed Values [1]	EIL (mg/kg) [2]
Arsenic	Generic EIL	100
Chromium (III)	ABC - 15 mg/kg (assumes an old NSW high traffic suburb) ACL - 190 mg/kg (assumes clay content <1 %)	205
Copper	ABC - 30 mg/kg (assumes an old NSW high traffic suburb) ACL - 60 mg/kg (assumes pH 4.5)	90
DDT	Generic EIL	180
Lead	ABC - 160 mg/kg (assumes an old NSW high traffic suburb) ACL – 1,100 mg/kg	1,260
Naphthalene	Generic EIL	170
Nickel	ABC - 5 mg/kg (assumes an old NSW high traffic suburb) ACL - 30 mg/kg (assumes CEC 5)	35
Zinc	ABC - 120 mg/kg (assumes an old NSW high traffic suburb) ACL - 70 mg/kg (assumes pH 4 & CEC 5)	190

Notes:
ACL - added contaminant limit; ACLs for Urban residential and public open space were used for this project
ABC - ambient background concentration
The most stringent ACL values were adopted for Chromium (III), Copper, Lead, Nickel and Zinc, as site soil physiochemical properties (i.e. pH, CEC and clay content) were not tested (Ref. NEPM 2013 Schedule B1, Tables 1B(1), 1B(2), 1B(3) and 1B(4) Soil-specific added contaminant limits)
[1] Assumed values are based on NEPM 2013 Schedule B5(c) Guideline on Ecological Investigation Levels for Arsenic, Chromium (III), Copper, DDT, Lead, Naphthalene, Nickel & Zinc
[2] EIL = ABC + ACL, unless Generic EIL is applicable

6.4 SOIL INVESTIGATIONS

The soil investigations conducted at the site are described in Table 6-3. Test bore locations are illustrated in Figure 2.

Table 6-3 Summary of Soil Investigation Methodology

Activity/Item	Details
Fieldwork	The site investigation was conducted on 10 December 2015. Boreholes BH101 to BH118 reached the target depth of natural soils, borehole BH119 did not reached the target depth due to buried slab and/or pipe, which caused auger refusal. Boreholes BH104M, BH106M and BH117M were converted to groundwater monitoring wells.
Drilling Method & Investigation Depth	All soil test bores where drilled using a hydraulic, ute-mounted, Drilled by HartGeo using a truck-mounted, mechanical, 200 mm diameter, solid-flight auger rig.

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 C.
Field Observations (including visual and olfactory signs of potential contamination)	A summary of field observations is provided, as follows: • A ash layer was observed in fill material at BH104M ; • Fibre cement sheet fragments were observed in surface fill at BH118 and within the gravelled area surrounding this borehole; and • Hydrocarbon odours were observed in boreholes BH106 (0.5 – 2.0 mBGL), BH109 (from 0.2 – 0.9 mBGL), BH111 (from 0.5 – 1.8 mBGL), BH114 (from 0.6 – 1.5 mBGL) and BH115 (from 0.2 – 0.6 mBGL).
Soil Sampling	• 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 was 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. • A small amount of duplicate was separated from all fill samples and placed into a zip-lock bag for asbestos analysis.
Decontamination Procedures	Drilling Equipment - The drilling rods were decontaminated between sampling locations with potable water until the augers were free of all residual materials. Sampling Equipment – Samples were collected via hand with a new pair of dedicated nitrile gloves for each sample and placed into laboratory prepared and pre-labelled sample jars.
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	A number of 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 9.
Soil Vapour Screening	Screening for potential VOCs in collected soil samples was conducted using a Photo-ionisation Detector (PID) (fitted with a 10.6 eV lamp) at sampling location during the course of the fieldwork.

6.5 GROUNDWATER INVESTIGATIONS

The groundwater investigations conducted at the site are described in Table 6-4. Monitoring well locations are illustrated in Figure 2.

Table 6-4 Summary of Groundwater Investigation Methodology

Activity/Item	Details
Fieldwork	Groundwater monitoring wells were installed and developed on 10 December 2015; whereas, water level gauging, well purging, field testing and groundwater sampling was conducted on 15 December 2015.
Well Construction	Test bores were converted to groundwater monitoring wells as follows: • One, 5.80 m deep, onsite, up-gradient well identified as BH104M; • One, 5.98 m deep, onsite well identified as BH106M; and • One, 5.80 m deep, onsite, down-gradient well identified as BH117M. Drilled by HartGeo using a truck-mounted, mechanical, 200 mm diameter, solid-flight auger rig. Well construction details are tabulated in Table 8-2 and documented in the bore logs presented in Appendix C. All wells were installed to screen the fractured shale aquifer within the interval 3.0 to 6.0 mBGL and were seated extremely weathered shale.
Well Construction (continued)	Well construction was in general accordance with the standards described in NUDLC, 2012 and involved the following: • 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 300mm 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 / ground level at boreholes BH106M and BH117M. BH104M was completed with a standpipe.
Well Development	Well development was conducted for each well directly following installation. This involved agitation within the full length of the water column using a dedicated, HDPE, disposable bailer. Bailing was continued until no further reduction in suspended sediment was observed (i.e. after removal of several well volumes) or the well became dry.
Well Survey (Elevation and location)	Well elevations at ground level were extrapolated from the spot elevations marked on the survey plan provided by the client (Figure 2). Well elevations at ground level were extrapolated in metres relative to Australian Height Datum (m AHD).
Well Gauging & Groundwater Flow Direction	Monitoring wells BH104M, BH106M and BH117M were gauged for standing water level (SWL, depth to groundwater) prior to well purging at the commencement of the GME on 15 December, 2015. All measured SWLs are shown in Table 8-2. A transparent HDPE bailer was used to visually assess for the presence PSH which was not detected in any of the wells. Based on the reduced water levels (RWLs, i.e. SWLs corrected to AHD) calculated at each monitoring well (Table 8-3). The direction of groundwater flow in the shallow aquifer was inferred to be in an easterly direction.

Activity/Item	Details
Well Purging, Field Testing & Groundwater Sampling	All groundwater monitoring wells were purged and sampled using low-flow/minimal drawdown sampling method with a MicroPurge kit (MP15) and a portable MicroPurge pump following well gauging. The MicroPurge system incorporates a low density poly-ethylene (LDPE) pump bladder, and a Teflon-lined LDPE sample delivery tube. The system used for this investigation employed pressurised carbon dioxide gas to regulate groundwater flow. Pump pressure and pumping cycles were adjusted accordingly to regulate extraction flow rate, and to avoid causing excessive drawdown of water level during the sampling process. Field measurement of water quality parameters was conducted continuously on purged groundwater with a water quality meter (Hanna Multi Parameter 9829) positioned within an open flow-through cell. Groundwater parameters tested in the field were Dissolved Oxygen (DO), Electrical Conductivity (EC), Redox, Temperature and pH. The measured parameters were recorded onto a field data sheet (Appendix D), along with the purged water volume at the time of measurement. Groundwater sampling was performed when three consecutive readings of groundwater parameter indicated stabilisation; as per the specified ranges detailed below: • Electrical Conductivity: ± 3% of the read value; • Redox: ± 20 mV; • DO: ± 20% of the read value; and • pH: ± 0.2 pH unit. Total water volume purged and stabilised groundwater parameters at each groundwater monitoring well are summarised in Table 8-3.
Decontamination Procedure	• 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	Sample containers were supplied by the laboratory with the following preservatives: • One, 1 litre amber glass, acid-washed and solvent-rinsed bottle; • Two, 40ml glass vials, pre-preserved with dilute hydrochloric acid, Teflon-sealed; and • One, 250mL, HDPE bottle, pre-preserved with dilute nitric acid (1 mL). Samples for metals analysis were field-filtered using 0.45 µm pore-size filters. All containers were filled with sample to the brim then capped and stored in ice-filled chests, until completion of the fieldwork and during sample transit to the laboratory.
Quality Control & Laboratory Analysis	All groundwater samples were submitted for analysis of previously-identified chemicals of concern 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 E.

7. DATA QUALITY ASSESSMENT

The assessment of data quality is defined as the scientific and statistical evaluation of environmental data to determine if these data meet the objectives of the project (Ref. US EPA, 2006). Data quality assessment includes an evaluation of the compliance of the field sampling and laboratory analytical procedures and an assessment of the accuracy and precision of these data from the laboratory quality control measurements obtained.

The data quality assessment process for this assessment included a review of analytical procedures to confirm compliance with established laboratory protocols and an assessment of the accuracy and precision of analytical data from a range of quality control measurements. The QC measures generated from the field sampling and analytical program were as follows:

- Suitable records of fieldwork observations including borehole logs;
- Relevant and appropriate sampling plan (density, type, and location);
- Use of approved and appropriate sampling methods;
- Preservation and storage of samples upon collection and during transport to the laboratory;
- Complete field and analytical laboratory sample COC procedures and documentation;
- Sample holding times within acceptable limits;
- Use of appropriate analytical procedures and NATA-accredited laboratories; and
- Required LOR (to allow for comparison with adopted IL);
- Frequency of conducting quality control measurements;
- Laboratory blanks;
- Field duplicates;
- Laboratory duplicates;
- Matrix spike/matrix spike duplicates (MS/MSDs);
- Surrogates (or System Monitoring Compounds);
- Analytical results for replicated samples, including field and laboratory duplicates and inter-laboratory duplicates, expressed as Relative Percentage Difference (RPD); and
- Checking for the occurrence of apparently unusual or anomalous results, e.g. laboratory results that appear to be inconsistent with field observations or measurements.

The findings of the data quality assessment in relation to the soil and groundwater investigations at the site are discussed in detail in Appendix G. QA/QC policies and DQOs are presented in Appendix H.

On the basis of the analytical data validation procedure employed the overall quality of the soil and groundwater analytical data produced for the site were considered to be of an acceptable standard for interpretive use.

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 boreholes, installation of monitoring wells may be described as a layer of anthropogenic filling overlying Residual Clays and Bringelly Shale at depth. The geological information obtained during the investigation is summarised in Table 8-1 and borehole logs from these works are presented in Appendix C.

Table 8-1 Generalised Subsurface Profile

Layer	Description	Depth to top & bottom of layer (mBGL)
		BH101 – BH119
Fill	Clayey SAND, fine grained, orange to brown, grading to dark brown, with gravel. SAND, fine to medium grained, orange.	0.0 – 1.1
Residual Clays	Silty CLAY; orange to grey, medium to high plasticity, with ironstone mottles.	0.2 – 1.7 (max depth 2.7 m)
	Silty CLAY; grey, medium plasticity, extremely weathered shale.	0.7 – 2.4
Bedrock	Shale, extremely weathered, grey, grading to brown.	0.9+ (BH104M, BH106M, BH109, BH113, BH114, BH115, BH116, BH117M)

Notes: + 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 0.0 m to 13.2 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, charcoal) and the following observations were noted:

- A ash layer was observed in fill material at BH104M;
- Fibre cement sheet fragments were observed in surface fill at BH118 and within the gravelled area surrounding this borehole; and
- Hydrocarbon odours were recorded at the following test borehole locations:
  - BH106 (0.5 – 2.0 mBGL);
  - BH109 (from 0.2 – 0.9 mBGL);
  - BH111 (from 0.5 – 1.8 mBGL);

- BH114 (from 0.6 – 1.5 mBGL); and
- BH115 (from 0.2 – 0.6 mBGL).

- Elevated VOC concentrations were detected in BH114 with concentrations of 39.1 parts per million (ppm) at a depth of 1.0 – 1.1 mBGL. This was consistent with a strong hydrocarbon odour observed within the sample. The PID results are shown in the borehole logs (Appendix C) and the samples showing higher PID values were therefore assigned for laboratory VOC and SVOC analysis.

8.2 GROUNDWATER INVESTIGATION RESULTS

8.2.1 Monitoring Well Construction

Well construction details for the installed groundwater monitoring wells are summarised in Table 8-2.

Table 8-2 Monitoring Well Construction Details

Well ID	Bore Depth (mBGL)	RL (GL)	RL (TOC)	Screen Interval (mBGL)	Lithology Screened
BH104M	6.00	30.40	30.62	3.0 - 6.0	Shale
BH106M	5.95	30.81	30.67	2.95 - 5.95	Shale
BH117M	5.80	29.27	29.14	2.80 – 5.80	Shale

Notes:
mBGL - metres below ground level.
RL - Reduced Level – Surveyed elevation in metres relative to Australian Height Datum (mAHD).
TOC - top of well casing
RL (TOC) - Surveyed elevation at TOC in m AHD.

8.2.2 Field Observations and Water Test Results

A GME was conducted on monitoring wells on 15 December 2015. 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 D.

Table 8-3 Groundwater Monitoring Event Field Data

Well ID	SWL (mBTOC)	RL (TOC)	WL† (mAHD)	Purge Volume (L)	Field pH	Field EC («S/cm)	Temp (ºC)	Redox (mV)	Odours / Turbidity / Sheen
BH104M	1.940	30.62	28.680	4.0	5.53	30,240	24.31	151.7	None / Clear / None
BH106M	1.624	30.67	29.046	4.5	6.51	13,480	25.61	51.40	None / Slight / None
BH117M	0.658	29.14	28.482	4.0	6.47	20,640	31.92	51.5	None / Slight / None

Notes:
SWL – Standing Water Levels 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).
† WL = Calculated groundwater level, in m AHD (calculated as RL – SWL) Note: these values were used for groundwater contouring analysis.
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.

With reference to Table 8-3, the field pH data indicated that the groundwater was slightly acidic (pH ranged from 5.53 to 6.51). Electrical Conductivity (EC) measurements were recorded in the range 13,480 to 30,240 µS/cm indicating that the groundwater was saline in terms of water salinity.

Based on the reduced water levels (RWLs, i.e. SWLs corrected to AHD) calculated at each monitoring well (Table 9-3). The direction of groundwater flow in the shallow aquifer was inferred to be in an easterly direction.

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 E and all laboratory analytical reports for tested soil samples are presented in Appendix F.

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
TRH				
29	F1 (C_6–C_9)	<25	<25	None
29	F2 (C_{10}-C_{36})	<50	510	Exceedance above the HSL criteria for BH114_1.0-1.1 (510 mg/kg).
29	F3 ($C1_6$-C_{34})	<90	270	None
29	F4 (C_{34}-C_{40})	<120	<120	None
BTEX				
28	Benzene	<0.1	<0.1	None
28	Toluene	<0.1	<0.1	None
28	Ethyl benzene	<0.1	<0.1	None
28	Total xylenes	<0.3	<0.3	None
28	Benzo(a)pyrene	<0.1	<0.1	None
OCPs				
21	OCPs excluding Chlordane and trans-Nonachlor	ND	ND	None
21	Chlordane	ND	0.4	None
21	Trans-Nonachlor	<0.1	0.1	None
OPPs				
21	Total OPPs	ND	ND	None detected
Heavy Metal				
28	Arsenic	3	12	None
28	Cadmium	<0.3	1.4	None
28	Chromium (Total)	9	78	None
28	Copper	9.3	61	None
28	Lead	12	150	

No. of primary samples	Analyte	Min. Conc. (mg/kg)	Max. Conc. (mg/kg)	Sample locations exceeding investigation levels
28	Mercury	<0.01	0.05	None
28	Nickel	1.1	50	Exceedance above the EIL criteria: BH117_0.0-0.1 (50 mg/kg)
28	Zinc	8.8	480	Exceedances above the EIL criteria BH105_0.0-0.1 (480 mg/kg), BH108_0.2-0.3 (220 mg/kg), BH118_0.4-0.5 (200 mg/kg).
PCBs				
21	Total PCBs	<1	<1	None
Asbestos				
23	Asbestos	No asbestos detected	Asbestos detected	Asbestos detected in BH117M_1.0-1.1 and BH118_0.0-0.1

8.4 GROUNDWATER ANALYTICAL RESULTS

A summary of laboratory results showing test sample quantities, minimum/maximum analyte concentrations and samples found to exceed the GILs, is presented in Table 8-5. More detailed tabulations of results showing the tested concentrations for individual samples alongside the adopted groundwater criteria are presented in Table T2 at the end of this report. Completed documentation used to track groundwater sample movements and laboratory receipt (COC and SRA forms) are copied in Appendix E. Copies of the laboratory analytical reports are attached in Appendix F.

Table 8-5 Summary of Groundwater Analytical Results

No. of primary samples	Analyte	Min. Conc. (mg/kg)	Max. Conc. (mg/kg)	Sample locations exceeding investigation levels
Hydrocarbons				
3	F1 C_6–C_{10}	<50	<50	None
3	F2 C_{10}-C_{16}	<60	<60	None
3	F3 C_{16}-C_{34}	<500	<500	None
3	F4 C_{34}-C_{40}	<500	<500	None
3	Benzene	<0.5	<0.5	None
3	Toluene	<0.5	<0.5	None
3	Ethyl benzene	<0.5	<0.5	None
3	o-xylene	<0.5	<0.5	None
3	Total xylenes	<1	<1	None
PAHs				
3	Total PAHs	<1	<1	None
Heavy Metal				
3	Arsenic	<1	4	None
3	Cadmium	0.1	1.9	Exceedance of the GILs: BH104M (1.9 µg/L)
3	Chromium (Total)	<1	<1	None
3	Copper	3	10	Exceedance of the GILs: BH104M (10 µg/L), BH106M (9 µg/L) and BH117M (3 µg/L).
3	Lead	<1	<1	None
3	Mercury	<0.1	<0.1	None
3	Nickel	16	160	Exceedance of the GILs for BH104M (160 µg/L), BH106M (39 µg/L) and BH117M (16 µg/L).
3	Zinc	140	2,600	Exceedance of the GILs for BH104M (2,600 µg/L), BH106M (140 µg/L) and BH117M (180 µg/L).
VOCs				
3	Total VOCs	ND	ND	None

9. SITE CHARACTERISATION DISCUSSION

9.1 ASBESTOS RISK

Asbestos was reported in fill material in samples BH117_0.0-0.1 and BH118_0.0-0.1. Fibrous asbestos was detected in BH117 with four (4), 2-4 mm length fibre bundles found loose in the sample, with 2 – 8 mm fibre bundles found in 30x20x4 mm cement sheet fragment in BH118. This is consistent with observations made within the area of these boreholes, which included crushed asbestos fibro pieces distributed throughout the gravelled car-park area located in the south western corner of the site. Vertical delineation was achieved, with no asbestos detected in the deeper fill samples BH117_1.0-1.1 and BH118-1.0-1.1 from both boreholes, indicating that the asbestos contamination is likely to be confined to the upper layer of fill material in that area. In addition, super-six asbestos sheeting was identified within the northern portion of the site and on existing building structures.

Given the identification of free asbestos fibres in soils, in addition to the presence of fragmented bonded asbestos, there is a potential risk of exposure to receptors should free fibres become airborne. EI recommend that further investigation of asbestos contamination identified at BH117 and BH118 (in the southern portion of the site) and in northern site areas is completed to further characterise and delineate the extent of asbestos for establishing the most suitable methodology for remediation.

9.2 TRH & BTEX IN SOIL

As described in Section 4, UPSS have been identified in the north-western area of the site (Figure 2). Based on information provided in the previous Stage 1 Environmental Site Assessment (CES, 2015), two USTs were present on site and used to store kerosene (30,000 L) and diesel (12,000 L). Borehole / groundwater monitoring well BH16M was installed down gradient of these identified USTs. No exceedances of TRH were reported above adopted HIL-B criteria in the investigation within soil samples and groundwater of BH106M. However, it is likely that the soils surrounding the UPSS have been impacted in some degree by hydrocarbons derived from the UPSS and associated infrastructure.

Total Recoverable Hydrocarbon (TRH) contamination was identified within soil sample BH114_1.0-1.1, with the concentration of the F2 fraction ($>C_{10}$-C_{16}) being above the adopted HSL-A & B and ESL criteria. Vertical delineation was achieved with the concentration of the F2 fraction in the deeper natural sample (BH114_1.6-1.7) being below the HSL-A & B and ESL criteria (98 mg/kg). This detection of TRH in borehole BH114 is consistent with field observations made during sampling, were a strong hydrocarbon odour was detected from depths of 0.6-1.5 mBGL, and elevated VOC concentration (39.1 ppm) detected via PID analysis at depths of 1.0 – 1.1 mBGL.

Hydrocarbon odours were also observed within soil samples at test boreholes BH106 (0.5 – 2.0 mBGL), BH109 (from 0.2 – 0.9 mBGL), BH111 (from 0.5 – 1.8 mBGL) and BH115 (from 0.2 – 0.6 mBGL). Although no elevated TRH concentrations were detected in soil samples analysed from these boreholes, further investigation into the source of the hydrocarbon odour is required as these boreholes are not located within close proximity to the known UPSS on site. i.e. whether the detected contamination was contributed to by vertical migration of contamination from the UPSS located further up-gradient, or by unknown contaminating underground infrastructure.

Therefore, EI recommend that all UPSS facilities shall be decommissioned, removed from the site and the soils in proximity be validated for their suitability of site redevelopment, in accordance with the Technical Note: Investigation of Service Station Sites (NSW EPA, 2014). If any TRH impacted material is identified, this material shall be excavated and managed separately for offsite disposal during bulk excavation works. In addition, further investigation into the source of hydrocarbon contamination at BH114 and staining and odours identified at BH109, BH111, and BH115, will be required.

No exceedances were detected for BTEX in any of the soil samples analysed during this investigation.

9.3 HEAVY METALS IN SOIL

Heavy metal concentrations detected above the adopted ecological criteria were identified at the following locations:

- BH105_0.0-0.1 - exceedance for zinc (480 mg/kg), vertical delineation was not achieved
- BH108_0.2-0.3 – exceedance for zinc (220 mg/kg), vertical delineation was not achieved
- BH117M_0.0-0.1 – exceedance for nickel (50 mg/kg), vertical delineation was achieved, with the deeper sample BH117M_1.0-1.1 being below the EIL criteria. This suggests that the elevated concentrations of nickel are likely to be confined to the fill material within that area.
- BH118_0.4-0.5 – exceedance for zinc (200 mg/kg), vertical delineation was not achieved.

As no basement level is proposed, EI recommends further delineation and remediation of these exceedances via the implementation of a Remediation Action Plan (RAP).

9.4 OCPS & OPPS IN SOIL

No exceedances of OCPs or OPPs above the HIL-A or EIL criteria were detected in soil samples analysed during this investigation. All concentrations were below the LOR with the exception of chlordane (0.4 mg/kg) and trans-nonachlor (0.1 mg/kg) in soil sample BH119_0.0-0.1. As these detections are at concentrations below the adopted soil criteria, they are not expected to pose a risk to human health and/or the environment.

9.5 HEAVY METALS, VOCS AND TRH IN GROUNDWATER

The following elevated heavy metal concentrations were identified in the groundwater monitoring wells installed at the site:

- Exceedances of cadmium in BH104M (1.9 µg/L);
- Exceedances of copper in BH104M (10 µg/L), BH106M (9 µg/L) and BH117M (3 µg/L);
- Exceedances of nickel in BH104M (160 µg/L), BH106M (39 µg/L) and BH117M (16 µg/L); and
- Exceedances of zinc in BH104M (2,600 µg/L), BH106M (140 µg/L) and BH117M (180 µg/L).

No exceedances of TRH or VOCs were detected in groundwater monitoring wells sampled during this investigation, including from groundwater bore BH106M adjacent to identified USTs. We note, however, that F2 TRH concentrations exceeding HSL A&B soil criteria were reported in test bore BH114, and staining and strong

hydrocarbon odours were also identified in bores BH109, BH111, and BH115, located in proximity to BH114. In light of this, additional groundwater assessment should be performed in this area of the site to characterise groundwater quality and any hydrocarbon contamination should it be present.

The results of the groundwater investigation indicate that high nickel and zinc concentrations are present in groundwater in BH104M, compared to monitoring wells BH106M and BH117M. Based on the inferred south / south-west groundwater flow direction, BH104M is inferred to be located at the up hydraulic gradient site boundary, and therefore, elevated heavy metal concentrations reported may be attributed to an offsite source to the north of the site

With respect to the identified groundwater contamination, as the proposed low density residential development does not involve the construction of a basement level car-park, with no beneficial groundwater abstraction likely due to groundwater quality, it is unlikely that a complete groundwater exposure pathway will exist onsite, and as such, the risks to site receptors is considered to be low.

While there is likely to be a low risk of exposure to site receptors from heavy metals in groundwater, we recommend that a second round of groundwater sampling should be performed to confirm elevated heavy metal results reported in this investigation. The installation of additional groundwater wells may also be required to assist with confirming an offsite source of the contamination.

9.6 Revised Conceptual Site Model - Post Field Investigation

The preliminary CSM discussed in Section 5 was considered appropriate to identify contamination sources, migration mechanisms and exposure pathways, as well as potential onsite and offsite receptors, on the basis of the findings from this investigation. Revisions of the model in regard to chemicals of concern, exposure pathways and potential receptors, however, were made in light of the field investigation findings with respect to the proposed development. The revised CSM is presented below:

9.6.1 Contaminants of Concern

The following chemicals are considered of concern for the site and the proposed development, with due consideration given to the currently available information:

- Soil (health related risks) –heavy metals, TRH, BTEX, VOCs, and asbestos;
- Soil (ecological related risks) – heavy metals (zinc and nickel), TRH, BTEX; and
- Groundwater – HMs, TRH, BTEX, VOCs.

9.6.2 Potential Sources, Exposure Pathways and Receptors

An amended CSM figure summarising potential contamination sources, exposure pathways, and human and environmental receptors based on currently available information is presented as Figure 10-1.

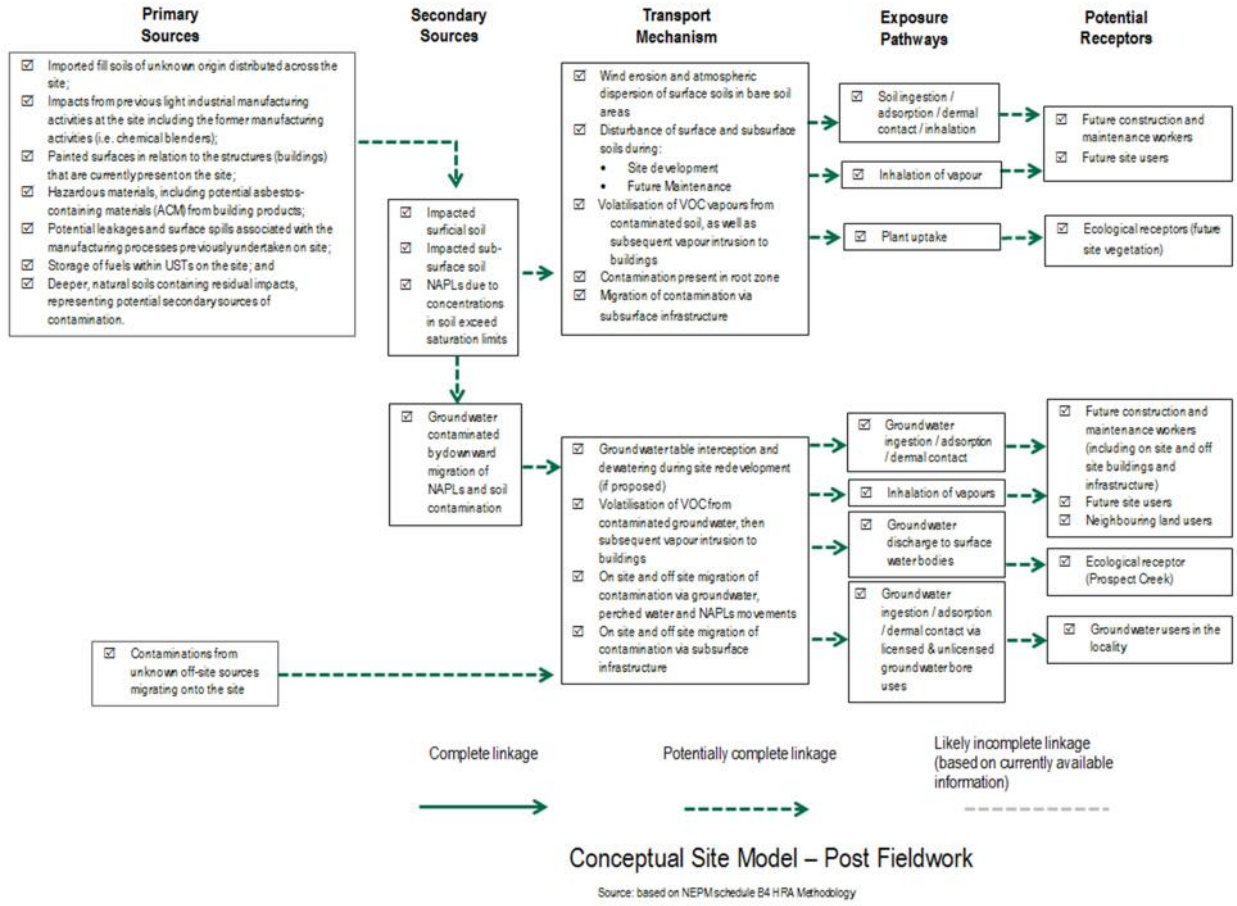


Figure 10-1 Revised Post-Fieldwork Conceptual Site Model

9.6.3 Data Gaps

The following remaining data gaps will require closure by further investigation:

- The spatial extent of asbestos, TRH and heavy metal contamination exceeding adopted human-health and ecological criteria at boreholes identified across the site;
- Further investigation is required to identify the source of hydrocarbon contamination at BH114 and staining and odours identified at BH109, BH111, and BH115 (i.e. whether the detected contamination was contributed to by vertical migration of contamination from the UPSS located further up-gradient, or by unknown contaminating underground infrastructure);
- Further investigation is required to establish the number of UPSS on site and to identify any additional UPSS and pipework, particularly pipework supplying former site operations within manufacturing warehouses;
- Groundwater quality in proximity to BH114 with regard to potential hydrocarbon contamination of groundwater;
- Confirmation of groundwater flow direction by the surveying of each individual well at the site;
- Confirmation of reported heavy metal concentrations in groundwater and verification of an offsite source of groundwater contamination;

- The quality of soils located in the footprint of the former residential dwelling located within the southern portion of the site; and
- Potential presence of hazardous materials present within the existing structure.

10. CONCLUSIONS

The property located at 37-39 Pavesi Street, Guildford West was the subject of a Detailed Site Investigation in order to assess the potential for on-site contamination associated with the identified current and former land uses. Based on the findings of this assessment it was concluded that:

- The site comprised a rectangular shaped block, covering a total area of approximately 8,050 m^2. The site is currently occupied by a large, commercial warehouse and former residential dwelling. The proposed development will involve the demolition of existing site structures and the construction of low density residential houses.
- A previous Stage 1, Preliminary Site Investigation was undertaken for the site by Consulting Earth Scientists in August, 2015, and identified the following:
  - The site and surrounding areas have a mixed history of industrial and commercial land use;
  - A previous environmental assessment was undertaken for Lot 36 DP10958 in 2007 by WSP Environmental Pty Ltd. This investigation identified that the site was previously used as a chemical blending facility. Two USTs were used to store kerosene (30,000 L) and diesel (12,000 L). In addition, three redundant USTs were also identified, located close to the eastern boundary, of which were installed by a trucking company who operated the site during the 1960s and 1970s. Anecdotal evidence from site representatives reported that the USTs were decommissioned and filled with water in the 1980s;
  - Potentially contaminating land use activities that were identified included:
    - Application of uncontrolled fill on the site;
    - Storage of chemicals on site associated with former manufacturing processes that took place (i.e. chemical blenders);
    - Leakages and surface spills associated within manufacturing processes on site;
    - Storage of fuels within the USTs and associated pipe work / fuel lines throughout the warehouse/site; and
    - Demolition of former site structures possibly constructed from hazardous building materials.
- Soil sampling and analysis was conducted at nineteen (19) targeted test bore locations (BH101 – BH119) down to a maximum depth of 5.98 m BGL. Sampling regime comprised judgemental and systematic (triangular grid) sampling patterns, with allowance for structural obstacles (e.g. building walls, underground and overhanging services and other physical obstructions in use by existing operating businesses);
- Boreholes BH104M, BH106M and BH117M were converted to groundwater monitoring bores;
- The sub-surface layers comprised of fill materials of various constituents, underlain by residual clays, with the Bringelly Shale at depth;

- Groundwater was encountered at depths ranging from 5.0 – 5.2 mBGL within the weathered Bringelly Shale;
- Results of soil samples analysed identified bonded and fibrous asbestos in surface fill samples at boreholes BH117 and BH118 located within the south western portion of the site. Vertical delineation was achieved, with the deeper fill samples being free of asbestos containing material, indicating that asbestos contamination is likely to be confined to the upper fill layer within the area. This is consistent with observations made within the vicinity of these boreholes, which included crushed asbestos fibro pieces distributed throughout the gravelled car-park area located in the south western corner of the site;
- Exceedances of heavy metals above the adopted EIL criteria were detected in soil samples at four borehole locations across the site. As accessible soils will be present with the proposed land use, EI recommends appropriate delineation and remediation in order to mitigate future impacts to the ecological environment;
- An exceedance of the F2 (>C_{10}-C_{16})) TRH fraction above the HSL A&B and ESL criteria was identified in soil sample BH114_1.0-1.1 (510 mg/kg). Vertical delineation was achieved with the concentration of the deeper sample (BH114_1.6-1.7) being below the HSL A&B and ESL criteria. BH114 was not located within close vicinity of the known UPSS tank farm, therefore indicating the potential for an additional UPSS or unknown source of TRH to be present on site;
- Hydrocarbon odours were observed in soil sample sat test boreholes BH106 (0.5 – 2.0 mBGL), BH109 (from 0.2 – 0.9 mBGL), BH111 (from 0.5 – 1.8 mBGL) and BH115 (from 0.2 – 0.6 mBGL). Although no elevated TRH concentrations were detected in soil samples analysed from these boreholes, the source of the odour is unknown;
- There were no exceedances of PAHs, BTEX,OCPs, OPPs and PCBs in soil samples analysed during this investigation; and
- Elevated concentrations of heavy metals were detected in groundwater monitoring wells BH104M, BH106M and BH117M. Based on the inferred groundwater flow direction to the east, the presence of elevated background heavy metal concentrations within groundwater indicates that high metal concentrations may be attributable to an offsite source.
- On review of the Preliminary Conceptual Site Model (CSM) developed as part of this ESA, it was concluded that the model remains valid for the proposed development. The following data gaps however remain and require closure by further investigations:
  - The spatial extent of asbestos, TRH and heavy metal contamination exceeding adopted human-health and ecological criteria at boreholes identified across the site;
  - The source of hydrocarbon contamination at BH114 and staining and odours identified at BH109, BH111, and BH115 (i.e. whether the detected contamination was contributed to by vertical migration of contamination from the UPSS located further up-gradient, or by unknown contaminating underground infrastructure);
  - Groundwater quality in proximity to BH114 with regard to potential hydrocarbon contamination of groundwater;
  - Further investigation is required to establish the number of UPSS on site and to identify any additional UPSS and pipework, particularly pipework supplying former site operations within manufacturing warehouses; and

- Confirmation of reported heavy metal concentrations in groundwater and verification of an offsite source of groundwater contamination.
- Groundwater flow direction requires confirmation in order to appropriately assess the risks associated with groundwater contamination and potential on / off-site sources. Confirmation can be achieved via the surveying of each well;
- The quality of soils located in the footprint of the former residential dwelling located within the southern portion of the site; and
- Potential presence of hazardous materials present within the existing structure.

Based on the findings of this report and with consideration of the Statement of Limitations (Section 12), EI conclude that contamination was identified at the site during this DSI. Concentrations exceeding human health based SILs were identified in surface fill and residual clay material within the south western and central eastern areas of the site. Heavy metal groundwater contamination, possibly associated with an off-site source, was also identified within the northern portion of the site.

While soil and groundwater contamination was identified at the site, EI concludes the site can be remediated in accordance with SEPP 55 to allow the site to be used for low density residential purposes, as outlined in the proposed development plans, subject to the implementation of the recommendations outline in Section 11.

11. RECOMMENDATIONS

Based on the findings of this investigation, the following recommendations are provided:

- Prior to site demolition, carry out a Hazardous Materials Survey on existing site structures to identify potentially hazardous building products that may be released to the environment during demolition;
- Preparation and implementation of a Remedial Action Plan (RAP), which should:
  - Outline the remediation requirements for soil and groundwater contamination identified and to close the existing data gaps identified during this DSI and other contamination that may be identified during data gap closure investigations;
  - Provide methodology for the appropriate decommissioning, removal and validation of the UPSS on site, in accordance with the Technical Note: Investigation of Service Station Sites (NSW EPA, 2014);
  - Provide the requirements and procedure for waste classification assessment, in order to enable classification of site soils to be excavated and disposed off-site, in accordance with the Waste Classification Guidelines (EPA, 2014); and
  - Provide a SAQP for the validation of remediation activities performed on-site.
- Undertake supplementary investigations, and subsequent remediation and validation works for the site, as outlined in the RAP. EI note that due to current site constrains, the additional investigations and remediation works may be conducted after site demolition when access to areas of environmental concern is made available; and
- Preparation of a validation report by a suitably qualified environmental consultant, certifying site suitability of soils and groundwater for the proposed land use.

12. STATEMENT OF LIMITATIONS

This report has been prepared for the exclusive use of [the client], who is the only intended beneficiary of EI's work. The scope of the investigations carried out for the purpose of this report is limited to those agreed with Bimioba Investments Trust on 26 November, 2015.

No other party should rely on the 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.

EI has used a degree of care and skill ordinarily exercised in similar investigations by reputable members of the environmental industry in Australia as at the date of this document. No other warranty, expressed or implied, is made or intended. Each section of this report must be read in conjunction with the whole of this report, including its appendices and attachments.

The conclusions presented in this report are based on a limited investigation of conditions, with specific sampling locations chosen to be as representative as possible under the given circumstances.

EI's professional opinions are reasonable and based on its professional judgment, experience, training and results from analytical data. EI may also have relied upon information provided by the Client and other third parties to prepare this document, some of which may not have been verified by EI.

EI's professional opinions contained in this document are subject to modification if additional information is obtained through further investigation, observations, or validation testing and analysis during remedial activities. In some cases, further testing and analysis may be required, which may result in a further report with different conclusions.

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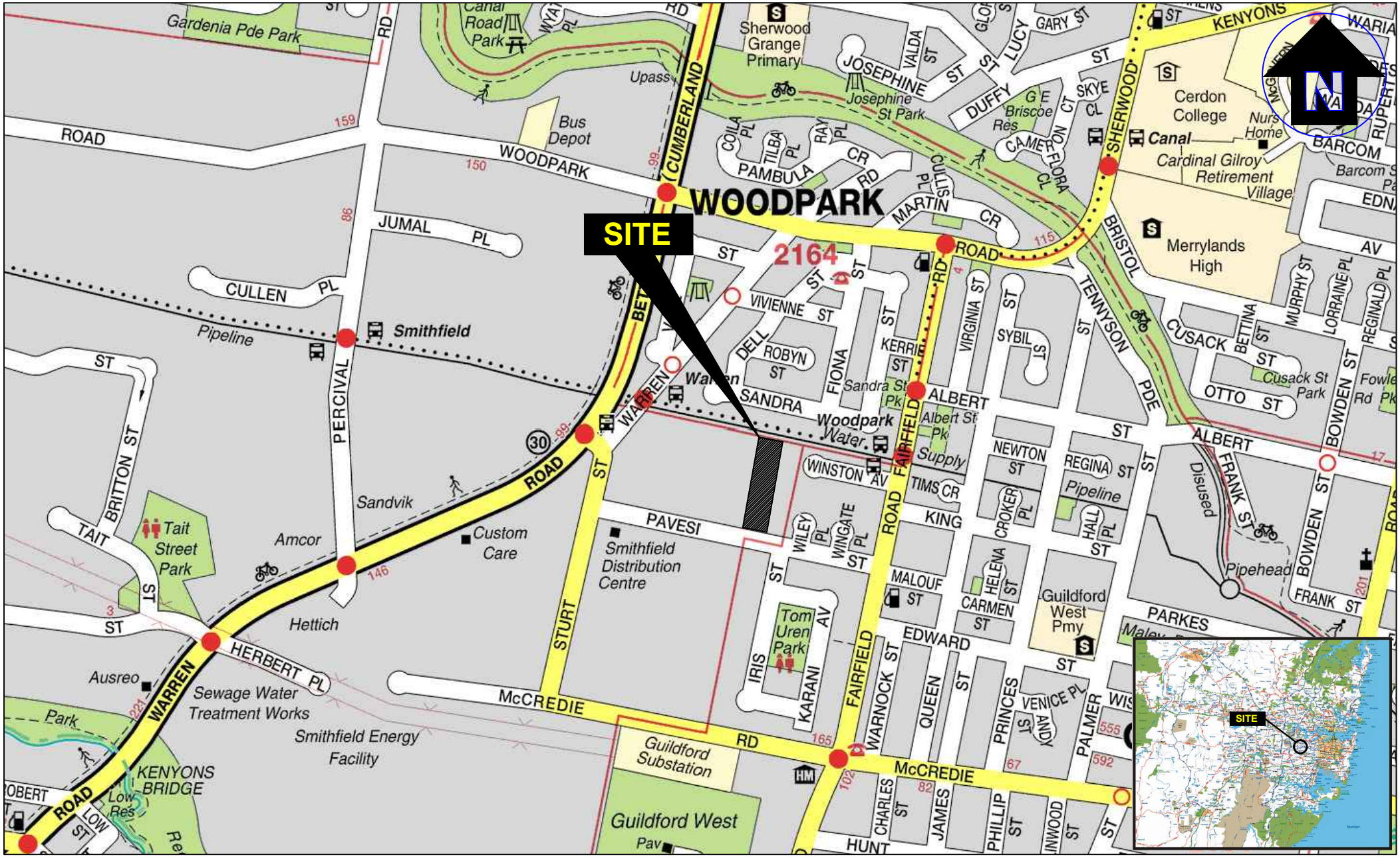
ABBREVIATIONS

ACM	Asbestos-containing materials
ASS	Acid sulfate soils
ANZECC	Australian and New Zealand Environment Conservation Council
ARMCANZ	Agriculture and Resource Management Council of Australia and New Zealand
B(a)P	Benzo(a)pyrene (a PAH compound)
BH	Borehole
BTEX	Benzene, Toluene, Ethylbenzene, Xylene
COC	Chain of Custody
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
DO	Dissolved Oxygen
DP	Deposited Plan
EC	Electrical Conductivity
Eh	Redox potential
EPA	Environment Protection Authority
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)
GIL	Groundwater Investigation Level
GME	Groundwater Monitoring Event
HIL	Health-based Investigation Level
HSL	Health-based Screening Level
km	Kilometres
LNAPL	Light, non-aqueous phase liquid (also referred to as PSH)
DNAPL	Dense, non-aqueous phase liquid
EIL	Ecological Investigation Level
ESL	Ecological Screening Level
m	Metres
m AHD	Metres Australian Height Datum
m BGL	Metres Below Ground Level
mg/L	Milligrams per litre
µg/L	Micrograms per litre
mV	Millivolts
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
PSH	Phase-separated hydrocarbons (also referred to as LNAPL)

PQL	Practical Quantitation Limit (limit of detection for respective laboratory instruments)
QA/QC	Quality Assurance / Quality Control
RAP	Remediation Action Plan
SRA	Sample receipt advice (document confirming laboratory receipt of samples)
SWL	Standing Water Level
TRH	Total Recoverable Hydrocarbons (non-specific analysis of organic compounds)
US EPA	United States Environmental Protection Agency
UPSS	Underground Petroleum Storage System
UST	Underground Storage Tank
VOCs	Volatile Organic Compounds (specific organic compounds which are volatile)
VOCCs	Volatile Organic Chlorinated Compounds (a sub-set of the VOC analysis suite)

FIGURES



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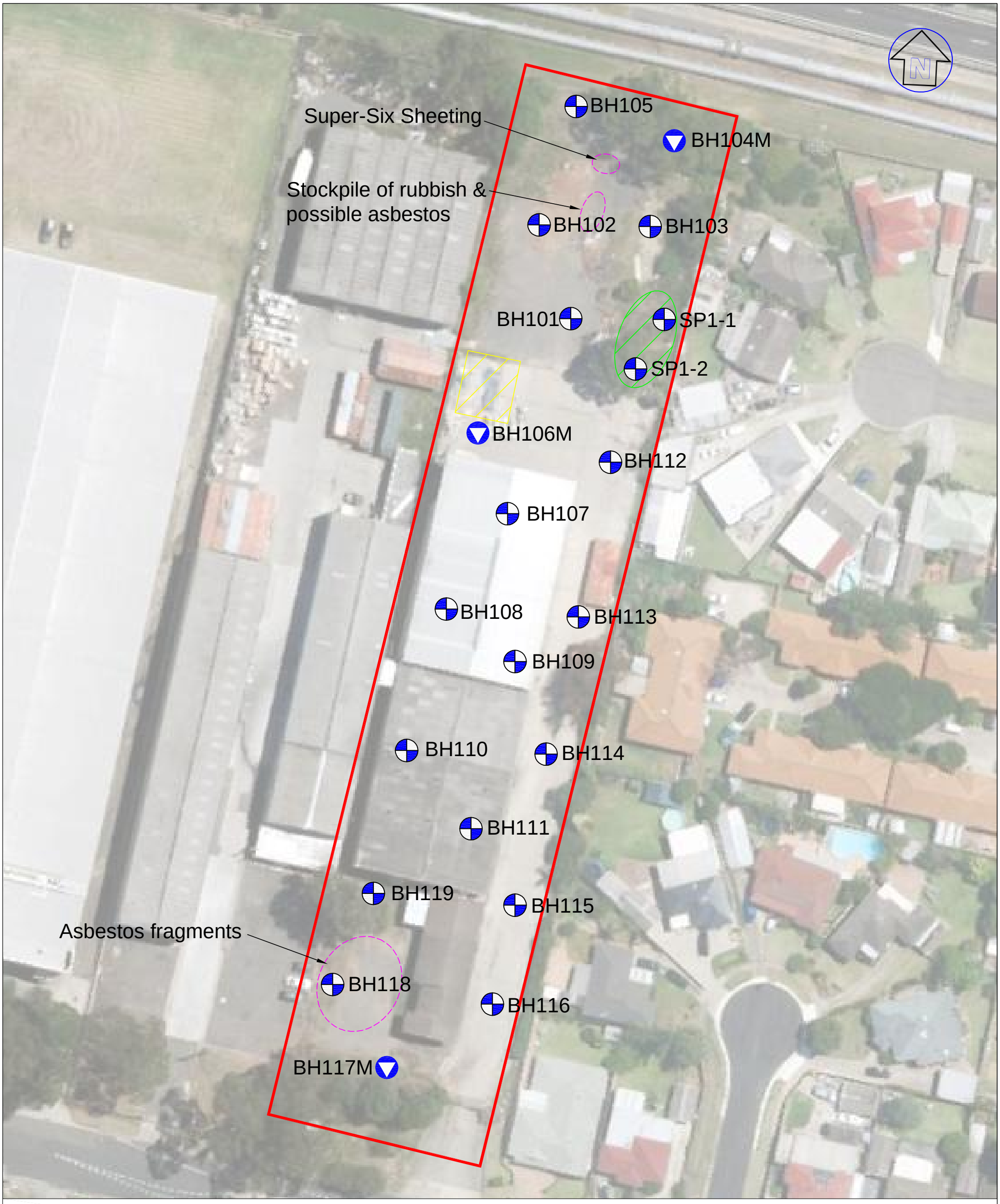
	Approved:	N.F.
	Date:	08-12-15
	Approx Scale:	N.T.S

Bimioba Investments Trust
Detailed Site Investigation
37-39 Pavesi Street,
Guildford West, NSW
Site Locality Plan

Figure:
1

Project: E22817



LEGEND

- Monitoring well
- Monitoring well / Borehole location
- Approx. site boundary
- Approx. location of USTs
- Approx. location of stockpile
- Approx. location of asbestos fragments & super-six sheeting

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Detailed Site Investigation
37-39 Pavesi Street, Guildford West, NSW
Site Layout and Sampling Locations

Figure: 2

Project: E22817 AA

KEY

Soil (mg/kg)	Sample ID	GW (µg/L)
dd-mm-yy	Date	dd-mm-yy
	Cadmium	0.7
	Copper	1.3
1,100	Lead	4.4
	Zinc	15
4	cPAH	
	TPH F1	40
	TPH F2	60
	1,2,5-trimethylbenzene	12
	1,1,2-trichloroethane	0.41
	1,2,4-trimethylbenzene	1.5

Notes:
All soil concentrations are in mg/kg. The table above shows exceedance criteria for HIL-D land use.
= Exceedance of HIL-D Criteria
= Exceedance of EIL/ESL Criteria
cPAH = Carcinogenic PAHs (or Benzo(a)Pyrene Toxicity Equivalence Quotient)

All groundwater concentrations are in µg/L. The table above shows exceedance criteria for GILs for Marine Water environments. Volatile Organic Compounds (VOCs)
= Exceedance of GIL for Fresh Waters

Sample ID	BH105_0.0-0.1
Date	10-12-15
Zn	480

Sample ID	BH104M
Date	15-12-15
Cd	1.9
Cu	10
Ni	160
Zn	2,600

Sample ID	BH106M
Date	15-12-15
Cu	9
Ni	39
Zn	140

Sample ID	BH108_0.2-0.3
Date	10-12-15
Zn	220

Sample ID	BH114_1.0-1.1
Date	10-12-15
F3	510

Sample ID	B118-0.0-0.1	BH118_0.4-0.5
Date	10-12-2015	
Zn	-	200
Asbestos	YES	-

Sample ID	BH117M_0.0-0.1	BH117M
Date	10-12-15	15-12-15
Cu	-	3
Ni	50	16
Zn	-	180
Asbestos	YES	-

Super-Six Sheeting
Stockpile of rubbish & possible asbestos
Asbestos fragments

BH105, BH104M, BH102, BH103, SP1-1, SP1-2, BH101, BH106M, BH112, BH107, BH108, BH113, BH109, BH110, BH114, BH111, BH119, BH115, BH118, BH116, BH117M

LEGEND

- Monitoring well
- Monitoring well / Borehole location
- Approx. site boundary
- Approx. location of USTs
- Approx. location of stockpile
- Approx. location of asbestos fragments & super-six sheeting

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Bimioba Investments Trust
Detailed Site Investigation
37-39 Pavesi Street, Guildford West, NSW
Sampling Exceedances

Figure: 3

Project: E22817 AA

TABLES

Table T1 - Summary of Soil Analytical results

Sample ID	Sampling Date	Heavy Metals								PAHs				BTEX				TRHs				OCPs (excluding Chlordane & trans-Nonachlor)	Chlordane	trans-Nonachlor	OPPs	Total PCBs	Asbestos
		As	Cd	Cr#	Cu	Pb	Hg	Ni	Zn	Carcinogenic PAHs (as B(a)P TEQ)	Benzo(a)pyrene	Total PAHs	Naphthalene	Benzene	Toluene	Ethylbenzene	Total Xylenes	F1[2]	F2[3]	F3 ($>C_{16}-C_{34}$)	F4 ($>C_{34}-C_{40}$)						
BH101_0.0-0.1	10/12/2015	6	0.4	14	11	18	0.04	7.5	35	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	ND	ND	<0.1	ND	<1	No
BH101_0.4-0.5		6	0.4	12	16	15	<0.01	4.2	35	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	NT	NT	NT	NT	NT	NT
BH102_0.0-0.1		7	0.5	18	16	20	0.02	7.5	45	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	ND	ND	<0.1	ND	<1	No
BH103_0.0-0.1		8	0.4	12	16	27	0.05	9.2	99	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	ND	ND	<0.1	ND	<1	No
BH104M_0.0-0.1		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	No
BH104M_0.4-0.5		7	0.3	12	11	16	0.01	8	28	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	ND	ND	<0.1	ND	<1	NT
BH105_0.0-0.1		7	0.5	9.8	22	150	0.02	8.7	480	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	ND	ND	<0.1	ND	<1	No
BH106M_0.2-0.3		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	No
BH106M_0.6-0.7		7	0.3	12	15	20	0.03	9.7	43	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	ND	ND	<0.1	ND	<1	NT
BH106M_0.9-1.0		5	<0.3	78	15	12	<0.01	25	23	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	NT	NT	NT	NT	NT	NT
BH107_0.2-0.3		3	0.6	17	49	22	0.02	25	83	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	ND	ND	<0.1	ND	<1	No
BH108_0.2-0.3		6	1.4	26	61	52	0.02	28	220	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	ND	ND	<0.1	ND	<1	No
BH109_0.2-0.3		10	0.3	15	11	19	0.01	5	19	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	ND	ND	<0.1	ND	<1	No
BH109_0.7-0.8		9	0.4	14	13	17	0.02	2.3	16	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	NT	NT	NT	NT	NT	NT
BH110_0.3-0.4		11	0.4	16	23	29	0.02	7.2	48	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	ND	ND	<0.1	ND	<1	No
BH111_0.2-0.3		7	0.4	12	13	22	<0.01	6	55	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	ND	ND	<0.1	ND	<1	No
BH111_1.1-1.2		12	0.5	20	16	19	0.02	5	32	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	82	<90	<120	NT	NT	NT	NT	NT	NT
BH112_0.2-0.3		8	0.5	19	21	21	<0.01	20	52	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	ND	ND	<0.1	ND	<1	No
BH113_0.2-0.3		12	0.5	17	12	20	0.02	6.7	26	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	ND	ND	<0.1	ND	<1	No
BH114_0.2-0.3		5	0.5	27	27	16	0.01	30	54	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	ND	ND	<0.1	ND	<1	No
BH114_1.0-1.1		10	0.3	9	12	12	0.01	1.2	12	<0.3	<0.1	4.4	<0.1	<0.1	<0.1	<0.1	<0.3	<25	510	270	<120	NT	NT	NT	NT	NT	NT
BH114_1.6-1.7		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<25	98	<90	<120	NA	NA	NA	NA	NA	NA
BH115_0.2-0.3		7	0.3	9.2	15	16	0.01	3.1	14	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	ND	ND	<0.1	ND	<1	No
BH115_0.5-0.6		7	0.4	12	9.3	15	<0.01	1.1	8.8	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	NT	NT	NT	NT	NT	NT
BH116_0.2-0.3		5	0.6	53	31	18	<0.01	26	71	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	ND	ND	<0.1	ND	<1	No
BH117M_0.0-0.1		3	0.7	66	40	37	0.01	50	88	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	ND	ND	<0.1	ND	<1	Yes
BH117M_1.0-1.1		8	0.6	15	9.3	20	0.02	5.8	28	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	NT	NT	NT	NT	NT	No
BH118_0.0-0.1		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	Yes
BH118_0.4-0.5		11	0.6	15	22	72	0.03	11	200	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	ND	ND	<0.1	ND	<1	NT
BH118_1.0-1.1		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No
BH119_0.0-0.1		6	0.6	20	28	57	0.02	25	110	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	ND	0.4	0.1	ND	<1	No
SP1-1		10	0.8	19	21	29	0.02	18	100	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	84	290	<120	ND	ND	<0.1	ND	<1	No
SP1-2		6	0.5	17	30	27	0.01	30	95	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	ND	ND	<0.1	ND	<1	No
SILs																											
HIL A - Residential with garden / acessible soils		100	20	100 Cr(VI)	6,000	300	40	400	7,400	3	1	300										NR	90	NR	NR	1	
HSL A & HSL B - Residential		Source depths (0 m to <1 m. BGL)											3	0.5	160	55	40	45	110								
Soil texture classification –Sand [1]		Source depths (1 m to <2 m. BGL)											NL	0.5	220	NL	60	70	240								
EILs / ESLs - urban residential and public open space [1 4]		100	NR	205	90	1,260	NR	35	190	NR	0.7	NR	170	50	85	70	105	180*	120*	300	2800	180			NR	NR	NR
Management Limits – Residential, parkland and public open space Coarse grained soil texture[1]																		700	1000	2500	10000						
Asbestos contamination HSL – Residential B Bonded ACM (%w/w)																											0.04
Asbestos contamination HSL for																											0.001

Notes: All results are recorded in mg/kg

Highlighted values indicates concentration exceeds Human Helath Based Soil Criteria

Highlighted values indicates concentration exceeds EIL / ESL.

HIL B NEPC 1999 Amendment 2013 'HIL B" Health Based Investigation Levels applicable for residential exposure settings with minimal opportunities for soil access, including dwellings with fully and permanently paved yard space such as high rise buildings and apartments.

\# Thresholds are for Chromium VI.

NR No current published criterion.

NL Not Limiting' If the derived soil vapour limit exceeds the soil concentration at which the pore water phase cannot dissolve any more of the individual chemical

ND 'Not detected' i.e. all concentrations of the compounds within the analyte group were found to be below the laboratory limits of detection.

NT 'Not Tested' i.e. the sample as not analysed.

1 Coarse Grained soil values were applied, being the most conservative of the material types.

Table T2 – Summary of Groundwater Investigation Results

Sample ID	Heavy Metals								BTEX					TRHs				Total PAHs	Total VOCs
	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury[5]	Nickel	Zinc	Benzene	Toluene	Ethylbenzene	o-xylene	m/p-xylene	F1*	F2**	F3 ($>C_{16}$-C_{34})	F4 ($>C_{34}$-C_{40})		
BH104M	<1	1.9	<1	10	<1	<0.1	160	2600	<0.5	<0.5	<0.5	<0.5	<1	<50	<60	<500	<500	<1	N.D.
BH106M	4	0.1	<1	9	<1	<0.1	39	140	<0.5	<0.5	<0.5	<0.5	<1	<50	<60	<500	<500	<1	N.D.
BH117M	3	0.2	<1	3	<1	<0.1	16	180	<0.5	<0.5	<0.5	<0.5	<1	<50	<60	<500	<500	<1	N.D.
GIL	24 as AS(III) 13 as AS(V)	0.2	N.R. (Cr III) 1[1] (Cr VI)	1.4	3.4	0.06[3]	11	8[1]	800[2]	NR[2]	NR[2]	350	200	50[4]	60[4]	500[4]	500[4]	N.R.	N.R.

Notes: All results are in units of µg/L.

GIL Groundwater Investigation Level. All GIL values sourced from National Environment Protection (Assessment of Site Contamination) Measure 1999 – Amendment 2013 , Schedule (B1) - Guideline on Investigation Levels for Soil and Groundwater, (NEPC) Investigation levels apply to Fresh Waters for typical slightly-moderately disturbed systems.

N.R. No current publish criterion.

N.D. Not Detected.

N.A. Not analysed.

* To obtain F1 subtract the sum of BTEX concentrations from the C6-C10 fraction.

** To obtain F2 subtract Naphthalene from the >C10-C16 fraction.

1 Indicated threshold value may not protect key species from chronic toxicity, refer to ANZECC & ARMCANZ (2000) for further guidance.

2 NEPM (2013) Table 1A(4) Groundwater HSL A & HSL B for vapour intrusion at the contaminant source depth ranges in sands 2m to <4m, considered most representative of fractured bedrock aquifer.

3 Chemical for which possible bioaccumulation and secondary poisoning effects should be considered, refer to ANZECC & ARMCANZ (2000) for further guidance.

4 Where GIL is less the than the laboratory reporting limit (LOR), the LOR is adoted as the GIL, as per DEC (2007).

5 Note: Laboratory reporting limit for Mecury dissolved in water is 0.1 µg/L.

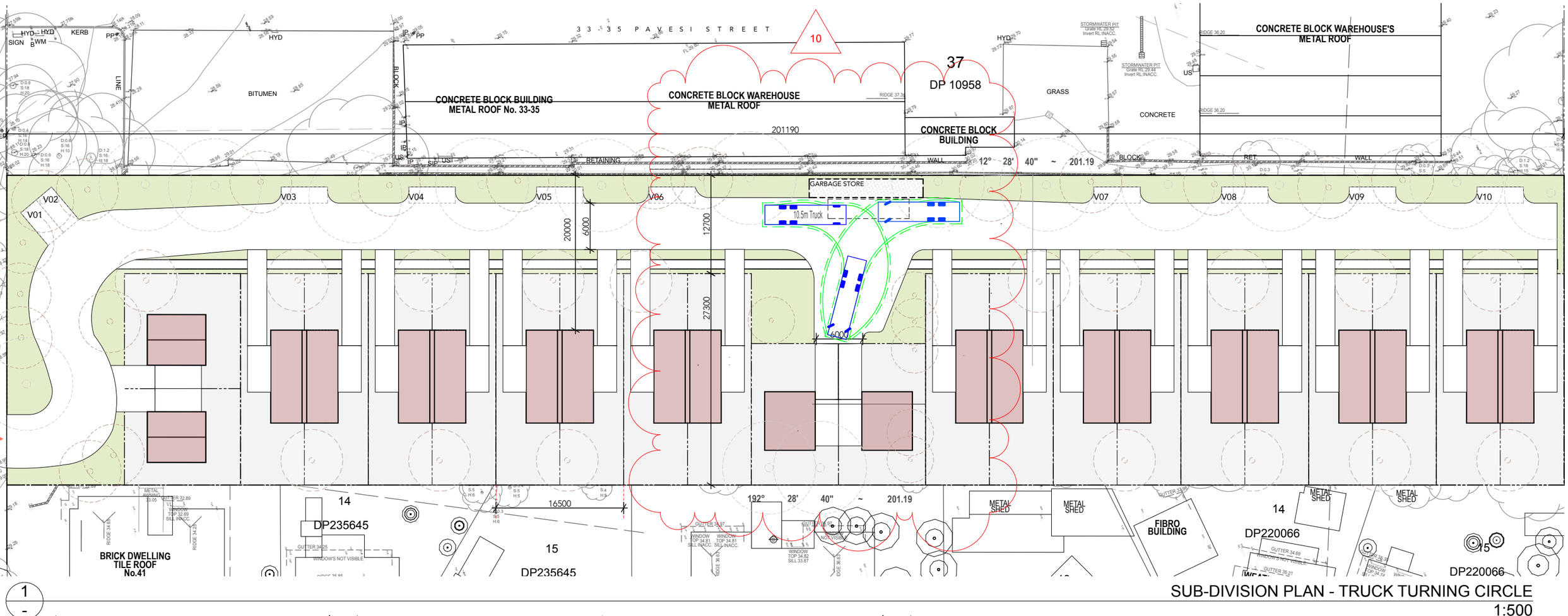
indicates concentration value exceeding the adopted GIL.

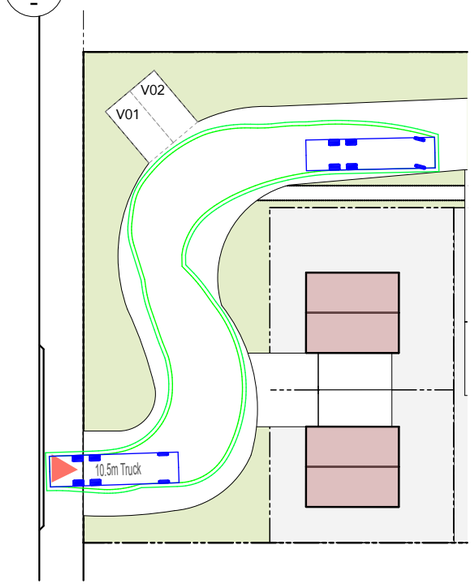
APPENDIX A

PROPOSED DEVELOPMENT PLANS

SUB-DIVISION PLAN - TRUCK TURNING CIRCLE

1:500

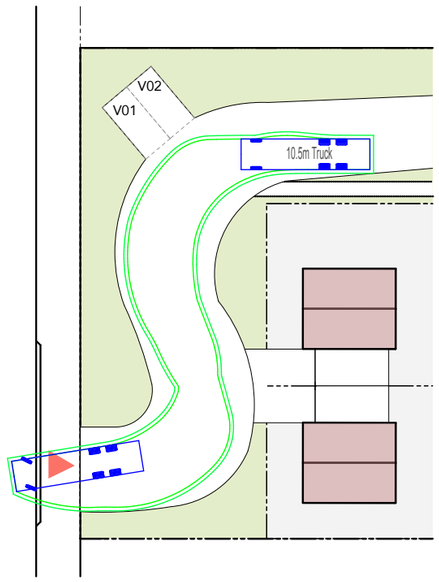




1 - 2 -

10.5m TRUCK ENTRY

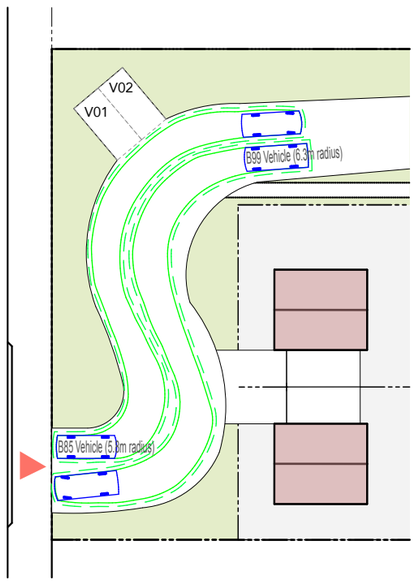
1:500



3 -

10.5m TRUCK EXIT

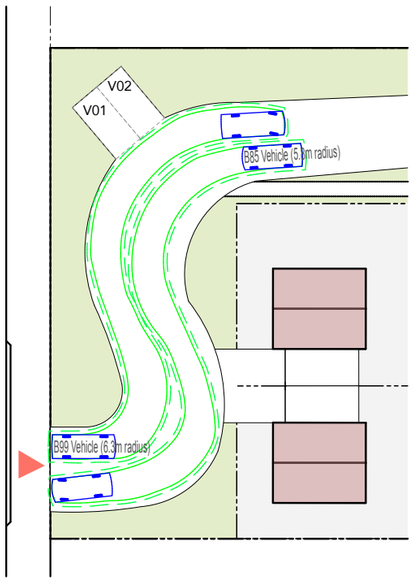
1:500



4 -

B85 ENTRY & B99 EXIT

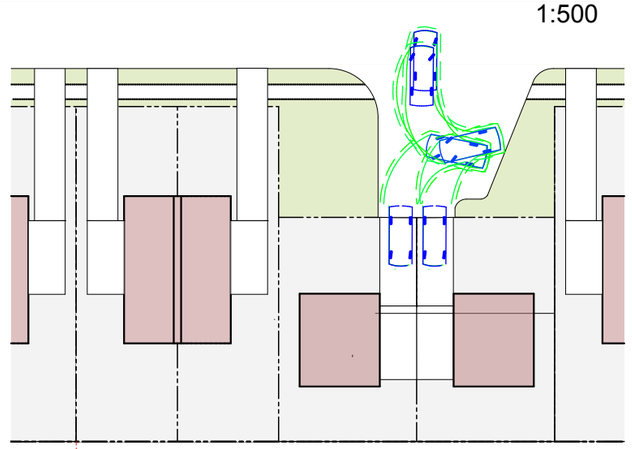
1:500



5 -

B99 ENTRY & B85 EXIT

1:500



6 -

GARAGE TURNING AREA

1:500

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WEST GUILDFORD
SUBDIVISION & DUAL OCCUPANCIES

client
The Trustee for Bimioba Investments Trust
Bill Yassine

drawing name
SKETCH DESIGN
ITERATION 10

drawing number	project no
AR10 001	1507.02A
scale	plot date
1:500 @ A3	5/02/2016

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client
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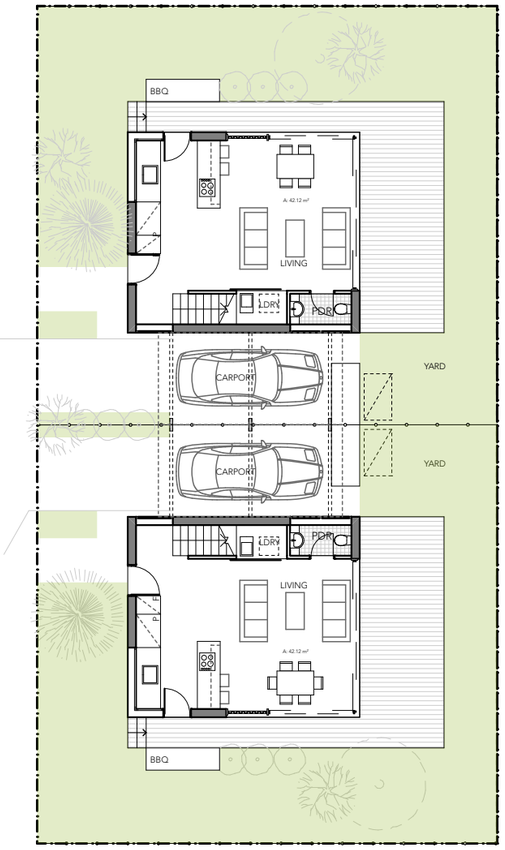
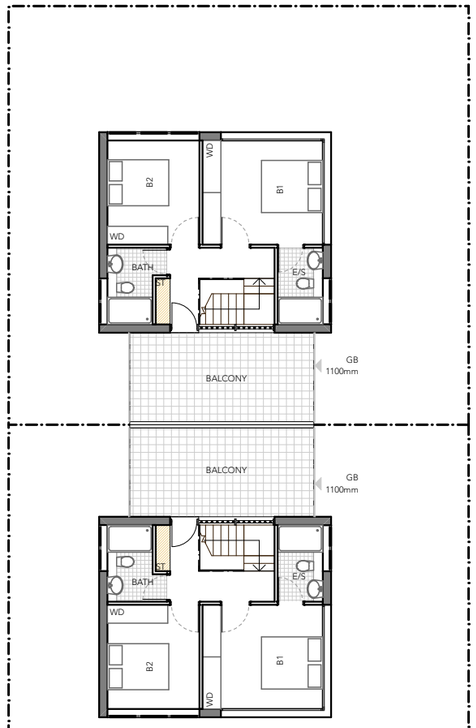
Bill Yassine

drawing name
SKETCH DESIGN
ITERATION 10

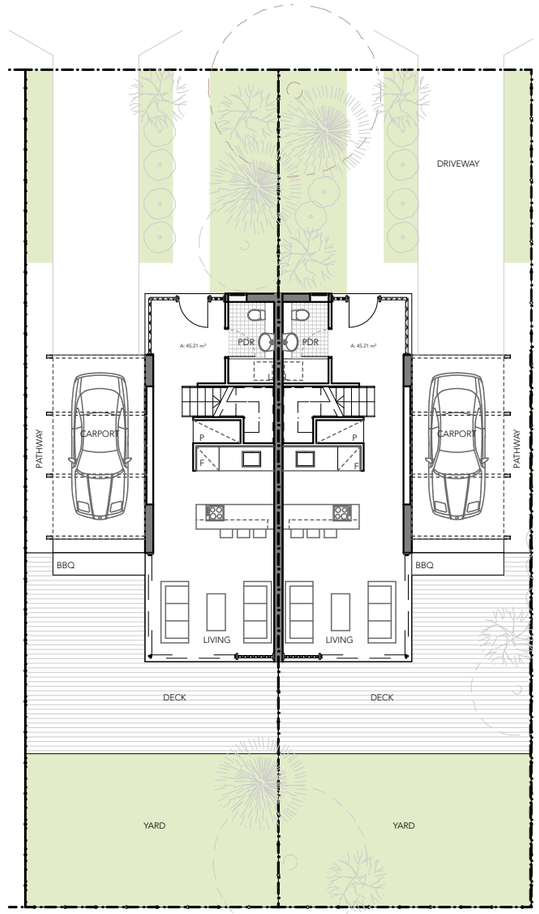
drawing number	project no
AR10 002	1507.02A
scale	plot date
@ A3	5/02/2016



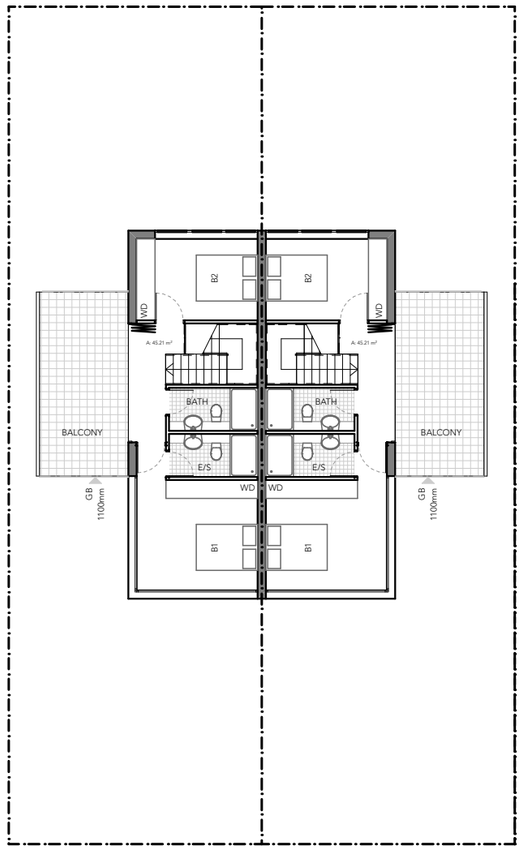
HOUSE A - LEVEL 1



HOUSE A - LEVEL 2

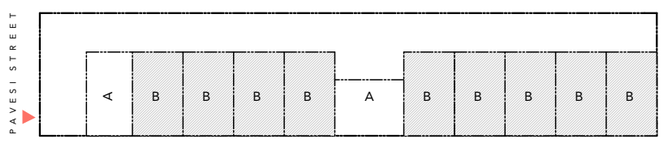


HOUSE B - LEVEL 1



HOUSE B - LEVEL 2

KEYPLAN (NTS)



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SUBDIVISION & DUAL OCCUPANCIES

client
The Trustee for Bimioba Investments Trust
Bill Yassine

drawing name
SKETCH DESIGN
CONCEPT DWELLING LAYOUTS

drawing number	project no
AR10 003	1507.02A
scale	plot date
1:200 @ A3	8/02/2016

APPENDIX B
Site Photographs

Photo 1: Current site buildings including a former residential dwelling and a large warehouse (photo facing north).

Photo 2: Grassed / gravelled area of the northern portion of the site (in foreground) with large warehouse in background (photo facing south).

Photo 3: Super-six asbestos sheeting located within the grassed / gravelled area in the northern portion of the site.

Photo 4: Stockpile of various materials, including possible super-six asbestos sheeting fragments.

Photo 5: Stockpile of unknown origin located within the north eastern portion of the site.

Photo 6: Underground petroleum storage systems and vent pipes located within the north western area of the site (refer to Figure 2).

Photo 7: Crushed asbestos- sheeting fragments located within the gravelled car-park in the southern portion of the site.

APPENDIX C
Borehole Logs

BOREHOLE: BH101

Environmental Investigations Australia
Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	37-39 Pavesi Street, Guildford West NSW			Date Started	10/12/15
Position	Refer to Figure 2			Date Completed	10/12/15
Job No.	E22817	Contractor	HartGEO Pty Ltd	Logged BA	Date: 10/12/15
Client	Bimioba Investment Trust	Drill Rig	Ute-mounted rig	Checked JS	Date: 14/12/15
		Inclination	-90°		

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	-	GWNE	0	0.20	BH101_0.0-0.1 ES 0.00-0.10 m 0.00 m PID = 2.1 ppm			-	FILL: Clayey SAND; fine grained, brown/orange, with some minor gravel, no odour.	D		FILL
					BH101_0.4-0.5 ES 0.40-0.50 m 0.40 m PID = 2.9 ppm			CI-CH	Silty CLAY; medium to high plasticity, orange/grey, with some ironstone mottles, no odour.	D	-	RESIDUAL SOIL
				0.80				-	SHALE; grey, inferred extremely weathered, no odour.			WEATHERED ROCK
			1	1.00	BH101_0.9-1.0 ES 0.90-1.00 m 0.90 m PID = 2.6 ppm				Hole Terminated at 1.00 m Target Depth Reached.			
			2									
			3									
			4									
			5									
			6									
			7									
			8									
			9									
			10									

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

BOREHOLE: BH102

Environmental Investigations Australia
Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	37-39 Pavesi Street, Guildford West NSW			Date Started	10/12/15
Position	Refer to Figure 2			Date Completed	10/12/15
Job No.	E22817	Contractor	HartGEO Pty Ltd	Logged BA	Date: 10/12/15
Client	Bimioba Investment Trust	Drill Rig	Ute-mounted rig	Checked JS	Date: 14/12/15
		Inclination	-90°		

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	-	GWNE	0	0.30	BH102_0.0-0.1 ES 0.00-0.10 m 0.00 m PID = 2 ppm			-	FILL: Clayey SAND; fine grained, brown/orange, with some minor gravel, no odour.	D		FILL
				0.80	BH102_0.6-0.7 ES 0.60-0.70 m 0.60 m PID = 1 ppm			CI-CH	Silty CLAY; medium to high plasticity, orange/grey, with some ironstone mottles, no odour.	D	-	RESIDUAL SOIL
			1	1.00	BH102_0.9-1.0 ES 0.90-1.00 m 0.90 m PID = 1.9 ppm			-	SHALE; grey, inferred extremely weathered, no odour.			WEATHERED ROCK
									Hole Terminated at 1.00 m Target Depth Reached.			
			2									
			3									
			4									
			5									
			6									
			7									
			8									
			9									
			10									

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

BOREHOLE: BH103

Environmental Investigations Australia
Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	37-39 Pavesi Street, Guildford West NSW			Date Started	10/12/15
Position	Refer to Figure 2			Date Completed	10/12/15
Job No.	E22817	Contractor	HartGEO Pty Ltd	Logged BA	Date: 10/12/15
Client	Bimioba Investment Trust	Drill Rig	Ute-mounted rig	Checked JS	Date: 14/12/15
		Inclination	-90°		

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	-	GWNE	0	0.30	BH103_0.0-0.1 ES 0.00-0.10 m 0.00 m PID = 1.4 ppm			-	FILL: Clayey SAND; fine grained, brown/orange, with some minor gravel, no odour.	D		FILL
				0.80	BH103_0.5-0.6 ES 0.50-0.60 m 0.50 m PID = 1.3 ppm			CI-CH	Silty CLAY; medium to high plasticity, orange/grey, with some ironstone mottles, no odour.	D	-	RESIDUAL SOIL
			1	1.00				-	SHALE; grey, inferred extremely weathered, no odour.			WEATHERED ROCK
									Hole Terminated at 1.00 m Target Depth Reached.			
			2									
			3									
			4									
			5									
			6									
			7									
			8									
			9									
			10									

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

BOREHOLE: BH104M

Environmental Investigations Australia
Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	37-39 Pavesi Street, Guildford West NSW			Date Started	10/12/15
Position	Refer to Figure 2			Date Completed	10/12/15
Job No.	E22817	Contractor	HartGEO Pty Ltd	Logged BA	Date: 10/12/15
Client	Bimioba Investment Trust	Drill Rig	Ute-mounted rig	Checked JS	Date: 14/12/15
		Inclination	-90°		

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	PIEZOMETER DETAILS ID / Static Water Level
AD/T	-	▽	0		BH104_0.0-0.1 ES 0.00-0.10 m 0.00 m PID = 1.9 ppm			-	ASPHALT: 10mm thick.	-		BH104M Gatic Cover Concrete
					BH104_0.4-0.5 ES 0.40-0.50 m 0.40 m PID = 1.8 ppm			-	FILL: CLAY; fine grained, brown/orange, with some minor gravel and ash layers, no odour.	D		
				0.90								
			1	1.10	BH104_0.8-0.9 ES 0.80-0.90 m 0.80 m PID = 1.4 ppm			CI-CH	Silty CLAY; medium to high plasticity, orange/grey, with some ironstone mottles, no odour.			
					BH104_1.2-1.3 ES 1.20-1.30 m 1.20 m PID = 1.9 ppm			-	SHALE; grey, inferred extremely weathered, no odour.	D		50 mm uPVC Casing
			2									Cuttings Bentonite
				2.50					From 2.5m, brown/grey.		-	
			3									
			4							SM		Sand 50 mm uPVC Screen
			5									
				6.00						W		
			6						Hole Terminated at 6.00 m Borehole converted into monitoring well.			
			7									
			8									
			9									
			10									

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

BOREHOLE: BH105

Environmental Investigations Australia
Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	37-39 Pavesi Street, Guildford West NSW			Date Started	10/12/15
Position	Refer to Figure 2			Date Completed	10/12/15
Job No.	E22817	Contractor	HartGEO Pty Ltd	Logged BA	Date: 10/12/15
Client	Bimioba Investment Trust	Drill Rig	Ute-mounted rig	Checked JS	Date: 14/12/15
		Inclination	-90°		

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	-	GWNE	0		BH105_0.0-0.1 ES 0.00-0.10 m 0.00 m PID = 1.8 ppm			-	FILL: Clayey SAND; fine grained, brown/orange, with some minor gravel, slight sulfur odour.	SM		FILL
				0.70	BH105_0.6-0.7 ES 0.60-0.70 m 0.60 m PID = 1.3 ppm			CI-CH	Silty CLAY; medium to high plasticity, orange/grey, with some ironstone mottles, no odour.	SM	-	RESIDUAL SOIL
			1	1.20	BH105_0.8-0.9 ES 0.80-0.90 m 0.80 m PID = 1.3 ppm			-	SHALE; grey, inferred extremely weathered, no odour.			WEATHERED ROCK
				1.50	BH105_1.4-1.5 ES 1.40-1.50 m 1.40 m PID = 0.9 ppm				Hole Terminated at 1.50 m Target Depth Reached.			
			2									
			3									
			4									
			5									
			6									
			7									
			8									
			9									
			10									

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

BOREHOLE: BH106M

Environmental Investigations Australia
Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	37-39 Pavesi Street, Guildford West NSW			Date Started	10/12/15
Position	Refer to Figure 2			Date Completed	10/12/15
Job No.	E22817	Contractor	HartGEO Pty Ltd	Logged BA	Date: 10/12/15
Client	Bimioba Investment Trust	Drill Rig	Ute-mounted rig	Checked JS	Date: 14/12/15
		Inclination	-90°		

Drilling					Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	PIEZOMETER DETAILS
DT			0	0.20				-	CONCRETE: 200mm thick.	-		ID Static Water Level BH106M
AD/T	-	GWNE	0		BH106_0.2-0.3 ES 0.20-0.30 m 0.20 m PID = 1.5 ppm			-	FILL: Clayey SAND; fine grained, brown/orange, with some minor gravel, slight hydrocarbon odour.	SM		BH106M
				0.70	BH106_0.6-0.7 ES 0.60-0.70 m 0.60 m PID = 2.5 ppm			CI-CH	Silty CLAY; medium to high plasticity, orange/grey, with some ironstone mottles, no odour.			
			1	1.20	BH106_0.9-1.0 ES 0.90-1.00 m 0.90 m PID = 1.8 ppm			-	SHALE; grey/brown, inferred extremely weathered, with clay bandings, slight hydrocarbon odour.			
					BH106_1.7-1.8 ES 1.70-1.80 m 1.70 m PID = 2.2 ppm							
			2		BH106_2.0-2.1 ES 2.00-2.10 m 2.00 m PID = 1.7 ppm							
				2.50					From 2.5m, dark grey/brown.			
			3		BH106_3.0-3.1 ES 3.00-3.10 m 3.00 m PID = 2.6 ppm					D	-	
			4	4.10	BH106_4.0-4.1 ES 4.00-4.10 m 4.00 m PID = 2.5 ppm				From 4.1m, no odour.			
			5									
			6	6.00					Hole Terminated at 6.00 m Borehole converted into monitoring well.			
			7									
			8									
			9									
			10									

Gatic Cover
Concrete
Cuttings
50 mm uPVC Casing
Bentonite
Sand
50 mm uPVC Screen

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

Environmental Investigations Australia
Contamination | Remediation | Geotechnical

BOREHOLE: BH107

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	37-39 Pavesi Street, Guildford West NSW			Date Started	10/12/15
Position	Refer to Figure 2			Date Completed	10/12/15
Job No.	E22817	Contractor	HartGEO Pty Ltd	Logged BA	Date: 10/12/15
Client	Bimioba Investment Trust	Drill Rig	Ute-mounted rig	Checked JS	Date: 14/12/15
		Inclination	-90°		

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
DT	-	GWNE	0		BH107_0.2-0.3 ES 0.20-0.30 m 0.20 m PID = 2.5 ppm			-	FILL: Clayey SAND; fine grained, brown/orange, with some minor gravel, no odour.	D D		FILL
				0.70								
			1		BH107_0.8-0.9 ES 0.80-0.90 m 0.80 m PID = 2.1 ppm			-	SHALE; grey, inferred extremely weathered, no odour.	D	-	WEATHERED ROCK
				1.70	BH107_1.6-1.7 ES 1.60-1.70 m 1.60 m PID = 2.3 ppm				Hole Terminated at 1.70 m Target Depth Reached.			
			2									
			3									
			4									
			5									
			6									
			7									
			8									
			9									
			10									

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

BOREHOLE: BH108

Environmental Investigations Australia
Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	37-39 Pavesi Street, Guildford West NSW			Date Started	10/12/15
Position	Refer to Figure 2			Date Completed	10/12/15
Job No.	E22817	Contractor	HartGEO Pty Ltd	Logged BA	Date: 10/12/15
Client	Bimioba Investment Trust	Drill Rig	Ute-mounted rig	Checked JS	Date: 14/12/15
		Inclination	-90°		

Drilling					Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
DT			0	0.20				-	CONCRETE: 200mm thick.	-		CONCRETE HARDSTAND
AD/T	-	GWNE			BH108_0.2-0.3 ES 0.20-0.30 m 0.20 m PID = 2.5 ppm			-	FILL: Clayey SAND; fine grained, brown/orange, with some minor gravel, no odour.	D		FILL
				0.70								
			1		BH108_0.8-0.9 ES 0.80-0.90 m 0.80 m PID = 2.3 ppm			CI-CH	Silty CLAY; medium to high plasticity, orange/grey, with some ironstone mottles, no odour.	D	-	RESIDUAL SOIL
				1.40								
				1.80	BH108_1.5-1.6 ES 1.50-1.60 m 1.50 m PID = 2.2 ppm			-	SHALE; grey, inferred extremely weathered, no odour.			WEATHERED ROCK
			2						Hole Terminated at 1.80 m Target Depth Reached.			
			3									
			4									
			5									
			6									
			7									
			8									
			9									
			10									

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

BOREHOLE: BH109

Environmental Investigations Australia
Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	37-39 Pavesi Street, Guildford West NSW			Date Started	10/12/15
Position	Refer to Figure 2			Date Completed	10/12/15
Job No.	E22817	Contractor	HartGEO Pty Ltd	Logged BA	Date: 10/12/15
Client	Bimioba Investment Trust	Drill Rig	Ute-mounted rig	Checked JS	Date: 14/12/15
		Inclination	-90°		

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
DT			0	0.20				-	CONCRETE: 200mm thick.	-		CONCRETE HARDSTAND
AD/T	-	GWNE	1	0.50	BH109_0.2-0.3 ES 0.20-0.30 m 0.20 m PID = 1.7 ppm			-	FILL: Clayey SAND; fine grained, brown/orange, with some minor gravel, no odour.	D		FILL
				0.90	BH109_0.7-0.8 ES 0.70-0.80 m 0.70 m PID = 2.4 ppm			CI-CH	Silty CLAY; medium to high plasticity, orange/grey, with some ironstone mottles, no odour.		-	RESIDUAL SOIL
				1.70	BH109_1.4-1.5 ES 1.40-1.50 m 1.40 m PID = 1.5 ppm			-	SHALE; grey, inferred extremely weathered, no odour.	D		WEATHERED ROCK
			2						Hole Terminated at 1.70 m Target Depth Reached.			
			3									
			4									
			5									
			6									
			7									
			8									
			9									
			10									

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

BOREHOLE: BH110

Environmental Investigations Australia
Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	37-39 Pavesi Street, Guildford West NSW			Date Started	10/12/15
Position	Refer to Figure 2			Date Completed	10/12/15
Job No.	E22817	Contractor	HartGEO Pty Ltd	Logged BA	Date: 10/12/15
Client	Bimioba Investment Trust	Drill Rig	Ute-mounted rig	Checked JS	Date: 14/12/15
		Inclination	-90°		

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
DT			0	0.20				-	CONCRETE: 200mm thick.	-		CONCRETE HARDSTAND
AD/T	-	GWNE	1	0.70	BH110_0.2-0.3 ES 0.20-0.30 m 0.20 m PID = 2.8 ppm BH110_0.3-0.4 ES 0.30-0.40 m 0.30 m PID = 2.1 ppm BH110_0.6-0.7 ES 0.60-0.70 m 0.60 m PID = 2.1 ppm BH110_0.9-1.0 ES 0.90-1.00 m 0.90 m PID = 2.4 ppm BH110_1.9-2.0 ES 1.90-2.00 m 1.90 m PID = 2.3 ppm			-	FILL: Clayey SAND; fine grained, brown/orange, with some minor gravel, no odour.	D		FILL
				1.40				CI-CH	Silty CLAY; medium to high plasticity, orange/grey, with some ironstone mottles, no odour.	D	-	RESIDUAL SOIL
			2	2.00				-	SHALE; grey, inferred extremely weathered, no odour.			WEATHERED ROCK
									Hole Terminated at 2.00 m Target Depth Reached.			
			3									
			4									
			5									
			6									
			7									
			8									
			9									
			10									

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

BOREHOLE: BH111

Environmental Investigations Australia
Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	37-39 Pavesi Street, Guildford West NSW			Date Started	10/12/15
Position	Refer to Figure 2			Date Completed	10/12/15
Job No.	E22817	Contractor	HartGEO Pty Ltd	Logged BA	Date: 10/12/15
Client	Bimioba Investment Trust	Drill Rig	Ute-mounted rig	Checked JS	Date: 14/12/15
		Inclination	-90°		

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
DT			0	0.20				-	CONCRETE: 200mm thick.	-		CONCRETE HARDSTAND
AD/T	-	GWNE	1	1.00	BH111_0.2-0.3 ES 0.20-0.30 m 0.20 m PID = 3 ppm			-	FILL: SAND; fine grained, brown/orange, with some minor gravel and glass fragments, strong hydrocarbon odour.	D	-	FILL
				1.30	BH111_1.1-1.2 ES 1.10-1.20 m 1.10 m PID = 24.8 ppm			-	FILL: Clayey SAND; fine grained, brown/orange, with some minor gravel, strong hydrocarbon odour.			
				1.70				CI-CH	Silty CLAY; medium to high plasticity, orange/grey, with some ironstone mottles, strong hydrocarbon odour.	D		RESIDUAL SOIL
				1.80				-	SHALE; grey, inferred extremely weathered, strong hydrocarbon odour.			WEATHERED ROCK
				2.00	BH111_1.9-2.0 ES 1.90-2.00 m 1.90 m PID = 3.5 ppm				From 1.8m, no odour. Hole Terminated at 2.00 m Target Depth Reached.			
			3									
			4									
			5									
			6									
			7									
			8									
			9									
			10									

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

BOREHOLE: BH112

Environmental Investigations Australia
Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	37-39 Pavesi Street, Guildford West NSW			Date Started	10/12/15
Position	Refer to Figure 2			Date Completed	10/12/15
Job No.	E22817	Contractor	HartGEO Pty Ltd	Logged BA	Date: 10/12/15
Client	Bimioba Investment Trust	Drill Rig	Ute-mounted rig	Checked JS	Date: 14/12/15
		Inclination	-90°		

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
DT			0	0.20				-	CONCRETE: 200mm thick.	-		CONCRETE HARDSTAND
AD/T	-	GWNE		0.50	BH112_0.2-0.3 ES 0.20-0.30 m 0.20 m PID = 1.4 ppm			-	FILL: Clayey SAND; fine grained, brown/orange, with some minor gravel, no odour.	D		FILL
				1.00	BH112_0.8-0.9 ES 0.80-0.90 m 0.80 m PID = 2.5 ppm			CI-CH	Silty CLAY; medium to high plasticity, orange/grey, with some ironstone mottles.	D	-	RESIDUAL SOIL
			1					-	SHALE; grey,inferredextremely weathered, no odour.			WEATHERED ROCK
				1.50					Hole Terminated at 1.50 m Target Depth Reached.			
			2									
			3									
			4									
			5									
			6									
			7									
			8									
			9									
			10									

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

BOREHOLE: BH113

Environmental Investigations Australia
Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	37-39 Pavesi Street, Guildford West NSW			Date Started	10/12/15
Position	Refer to Figure 2			Date Completed	10/12/15
Job No.	E22817	Contractor	HartGEO Pty Ltd	Logged BA	Date: 10/12/15
Client	Bimioba Investment Trust	Drill Rig	Ute-mounted rig	Checked JS	Date: 14/12/15
		Inclination	-90°		

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
DT			0	0.20				-	CONCRETE: 200mm thick.	-		CONCRETE HARDSTAND
AD/T	-	GWNE	1	0.50	BH113_0.2-0.3 ES 0.20-0.30 m 0.20 m PID = 2.4 ppm			CI-CH	Silty CLAY; medium to high plasticity, orange/grey, with some ironstone mottles.			RESIDUAL SOIL
				0.90	BH113_0.7-0.8 ES 0.70-0.80 m 0.70 m PID = 2.8 ppm			-	SHALE; grey, inferred extremely weathered, with gravel, no odour.	D	-	WEATHERED ROCK
				1.50				-	SHALE; grey/brown, inferred extremely weathered, with clay bandings, no odour.			
			2						Hole Terminated at 1.50 m Target Depth Reached.			
			3									
			4									
			5									
			6									
			7									
			8									
			9									
			10									

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

BOREHOLE: BH114

Environmental Investigations Australia
Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	37-39 Pavesi Street, Guildford West NSW			Date Started	10/12/15
Position	Refer to Figure 2			Date Completed	10/12/15
Job No.	E22817	Contractor	HartGEO Pty Ltd	Logged BA	Date: 10/12/15
Client	Bimioba Investment Trust	Drill Rig	Ute-mounted rig	Checked JS	Date: 14/12/15
		Inclination	-90°		

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
DT			0	0.20				-	CONCRETE: 200mm thick.	-		CONCRETE HARDSTAND
AD/T	-	GWNE			BH114_0.2-0.3 ES 0.20-0.30 m 0.20 m PID = 0.2 ppm			-	FILL: Clayey SAND; fine grained, brown/orange, with some minor gravel, no odour.	D		FILL
				0.60	BH114_0.5-0.6 ES 0.50-0.60 m 0.50 m PID = 3.4 ppm			CI-CH	Silty CLAY; medium to high plasticity, orange/grey, with some ironstone mottles.			RESIDUAL SOIL
			1	1.00	BH114_1.0-1.1 ES 1.00-1.10 m 1.00 m PID = 39.1 ppm			-	SHALE; grey, inferred extremely weathered strong hydrocarbon odour.	D	-	WEATHERED ROCK
				1.50	BH114_1.6-1.7 ES 1.60-1.70 m 1.60 m PID = 2 ppm			-	SHALE; grey/brown, inferred extremely weathered, with clay bandings, no odour.			
			2	1.80					Hole Terminated at 1.80 m Target Depth Reached.			
			3									
			4									
			5									
			6									
			7									
			8									
			9									
			10									

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

BOREHOLE: BH115

Environmental Investigations Australia
Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	37-39 Pavesi Street, Guildford West NSW			Date Started	10/12/15
Position	Refer to Figure 2			Date Completed	10/12/15
Job No.	E22817	Contractor	HartGEO Pty Ltd	Logged BA	Date: 10/12/15
Client	Bimioba Investment Trust	Drill Rig	Ute-mounted rig	Checked JS	Date: 14/12/15
		Inclination	-90°		

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
DT			0	0.20				-	CONCRETE: 200mm thick.	-		CONCRETE HARDSTAND
AD/T	-	GWNE		0.40	BH115_0.2-0.3 ES 0.20-0.30 m 0.20 m PID = 3.1 ppm			-	FILL: Clayey SAND; fine grained, brown/orange, with some minor gravel, no odour.	D		FILL
				0.60	BH115_0.5-0.6 ES 0.50-0.60 m 0.50 m PID = 2.1 ppm			CI-CH	Silty CLAY; medium to high plasticity, orange/grey, with some ironstone mottles, strong hydrocarbon odour.			RESIDUAL SOIL
			1	1.20	BH115_1.1-1.2 ES 1.10-1.20 m 1.10 m PID = 1.8 ppm			-	SHALE; grey, inferred extremely weathered, no odour.	D	-	WEATHERED ROCK
				1.30				-	SHALE; grey/brown, inferred extremely weathered with clay bandings, no odour.			
									Hole Terminated at 1.30 m Target Depth Reached.			
			2									
			3									
			4									
			5									
			6									
			7									
			8									
			9									
			10									

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

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BOREHOLE: BH116

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	37-39 Pavesi Street, Guildford West NSW			Date Started	10/12/15
Position	Refer to Figure 2			Date Completed	10/12/15
Job No.	E22817	Contractor	HartGEO Pty Ltd	Logged BA	Date: 10/12/15
Client	Bimioba Investment Trust	Drill Rig	Ute-mounted rig	Checked JS	Date: 14/12/15
		Inclination	-90°		

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
DT			0	0.20				-	CONCRETE: 200mm thick.	-		CONCRETE HARDSTAND
AD/T	-	GWNE		0.50	BH116_0.2-0.3 ES 0.20-0.30 m 0.20 m PID = 1.6 ppm			-	FILL: Clayey SAND; fine grained, brown/orange, with some minor gravel, no odour.	D		FILL
				0.70	BH116_0.6-0.7 ES 0.60-0.70 m 0.60 m PID = 1.8 ppm			CI-CH	Silty CLAY; medium to high plasticity, orange/grey, with some ironstone mottles, strong hydrocarbon odour.		-	RESIDUAL SOIL
			1	1.20				-	SHALE; grey, inferred extremely weathered, no odour.	D		WEATHERED ROCK
				1.40				-	SHALE; grey/brown, inferred extremely weathered, with clay bandings, no odour.			
									Hole Terminated at 1.40 m Target Depth Reached.			
			2									
			3									
			4									
			5									
			6									
			7									
			8									
			9									
			10									

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

BOREHOLE: BH117M

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Project	Detailed Site Investigation			Sheet	1 OF 1
Location	37-39 Pavesi Street, Guildford West NSW			Date Started	10/12/15
Position	Refer to Figure 2			Date Completed	10/12/15
Job No.	E22817	Contractor	HartGEO Pty Ltd	Logged BA	Date: 10/12/15
Client	Bimioba Investment Trust	Drill Rig	Ute-mounted rig	Checked JS	Date: 14/12/15
		Inclination	-90°		

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	PIEZOMETER DETAILS ID / Static Water Level
AD/T	-	▽	0		BH117_0.0-0.1 ES 0.00-0.10 m 0.00 m PID = 1.8 ppm BH117_0.4-0.5 ES 0.40-0.50 m 0.40 m PID = 1.8 ppm			-	FILL: SAND; fine to medium grained, dark brown/grey, with clay and gravel, no odour.	D		BH117M Gatic Cover Concrete
			1	1.20	BH117_1.0-1.1 ES 1.00-1.10 m 1.00 m PID = 1.7 ppm			CI-CH	Silty CLAY; medium to high plasticity, orange/grey, with some ironstone mottles, strong hydrocarbon odour.			Cuttings 50mm uPVC Casing
			2	1.70	BH117_1.6-1.7 ES 1.60-1.70 m 1.60 m PID = 1.6 ppm			-	SHALE; grey, inferred extremely weathered, no odour.			
				2.40				-	SHALE; grey/brown, inferred extremely weathered, with clay bandings, no odour.	M	-	Bentonite
			3									
			4									Sand 50 mm uPVC Screen
			5							W		
			6	6.00					Hole Terminated at 6.00 m Borehole converted into monitoring well.			
			7									
			8									
			9									
			10									

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

BOREHOLE: BH118

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Project	Detailed Site Investigation			Sheet	1 OF 1
Location	37-39 Pavesi Street, Guildford West NSW			Date Started	10/12/15
Position	Refer to Figure 2			Date Completed	10/12/15
Job No.	E22817	Contractor	HartGEO Pty Ltd	Logged BA	Date: 10/12/15
Client	Bimioba Investment Trust	Drill Rig	Ute-mounted rig	Checked JS	Date: 14/12/15
		Inclination	-90°		

Drilling					Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	-	GWNE	0		BH118_0.4-0.5 ES 0.40-0.50 m 0.40 m PID = 3.2 ppm			-	FILL: Clayey SAND; fine grained, brown/orange, with some minor gravel, no odour.	D	-	FILL
			1	*1.10*	BH118_1.0-0.1 ES 1.00 m 1.00 m PID = 3.7 ppm BH118_1.0-1.1 ES 1.00-1.10 m BH118_1.0-1.2 ES 1.00-1.20 m 1.00 m PID = 3.6 ppm BH118_1.5-1.6 ES 1.50-1.60 m 1.50 m PID = 3.5 ppm			-	SHALE; grey, inferred extremely weathered, no odour.	D		WEATHERED ROCK
			2	*2.00*					Hole Terminated at 2.00 m Target Depth Reached.			
			3									
			4									
			5									
			6									
			7									
			8									
			9									
			10									

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

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BOREHOLE: BH119

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	37-39 Pavesi Street, Guildford West NSW			Date Started	10/12/15
Position	Refer to Figure 2			Date Completed	10/12/15
Job No.	E22817	Contractor	HartGEO Pty Ltd	Logged BA	Date: 10/12/15
Client	Bimioba Investment Trust	Drill Rig	Ute-mounted rig	Checked JS	Date: 14/12/15
		Inclination	-90°		

Drilling					Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	-	GWNE	0	0.40	BH119_0.0-0.1 ES 0.00-0.10 m 0.00 m PID = 3 ppm			-	FILL: Clayey SAND; fine grained, brown/orange, with some minor gravel and mulch, no odour.	D	-	FILL
									Hole Terminated at 0.40 m Target Depth Reached.			
			1									
			2									
			3									
			4									
			5									
			6									
			7									
			8									
			9									
			10									

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

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EXPLANATION OF NOTES, ABBREVIATIONS & TERMS USED ON BOREHOLE AND TEST PIT LOGS

DRILLING/EXCAVATION METHOD

HA	Hand Auger	RD	Rotary blade or drag bit	NQ	Diamond Core - 47 mm
DTC	Diatube Coring	RT	Rotary Tricone bit	NMLC	Diamond Core - 52 mm
NDD	Non-destructive digging	RAB	Rotary Air Blast	HQ	Diamond Core - 63 mm
AS*	Auger Screwing	RC	Reverse Circulation	HMLC	Diamond Core - 63mm
AD*	Auger Drilling	PT	Push Tube	BH	Tractor Mounted Backhoe
*V	V-Bit	CT	Cable Tool Rig	EX	Tracked Hydraulic Excavator
*T	TC-Bit, e.g. ADT	JET	Jetting	EE	Existing Excavation
ADH	Hollow Auger	WB	Washbore or Bailer	HAND	Excavated by Hand Methods

PENETRATION/EXCAVATION RESISTANCE

L **Low resistance.** Rapid penetration/ excavation possible with little effort from equipment used.

M **Medium resistance.** Penetration/ excavation possible at an acceptable rate with moderate effort from equipment used.

H **High resistance.** Penetration/ excavation is possible but at a slow rate and requires significant effort from equipment used.

R **Refusal/ Practical Refusal.** No further progress possible without risk of damage or unacceptable wear to equipment used.

These assessments are subjective and are dependent on many factors, including equipment power and weight, condition of excavation or drilling tools and experience of the operator.

WATER

Water level at date shown

Water inflow

Partial water loss

Complete water loss

GROUNDWATER NOT OBSERVED — Observation of groundwater, whether present or not, was not possible due to drilling water, surface seepage or cave-in of the borehole/ test pit.

GROUNDWATER NOT ENCOUNTERED — Borehole/ test pit was dry soon after excavation. However, groundwater could be present in less permeable strata. Inflow may have been observed had the borehole/ test pit been left open for a longer period.

SAMPLING AND TESTING

SPT	Standard Penetration Test to AS1289.6.3.1-2004
4,7,11 N=18	4,7,11 = Blows per 150mm. N = Blows per 300mm penetration following 150mm
seating 30/80mm	Where practical refusal occurs, the blows and penetration for that interval are reported
RW	Penetration occurred under the rod weight only
HW	Penetration occurred under the hammer and rod weight only
HB	Hammer double bouncing on anvil
Sampling	
DS	Disturbed Sample
BDS	Bulk disturbed Sample
GS	Gas Sample
WS	Water Sample
U63	Thin walled tube sample - number indicates nominal sample diameter in millimetres
Testing	
FP	Field Permeability test over section noted
FVS	Field Vane Shear test expressed as uncorrected shear strength (sv = peak value, sr = residual value)
PID	Photoionisation Detector reading in ppm
PM	Pressuremeter test over section noted
PP	Pocket Penetrometer test expressed as instrument reading in kPa
WPT	Water Pressure tests
DCP	Dynamic Cone Penetrometer test
CPT	Static Cone Penetration test
CPTu	Static Cone Penetration test with pore pressure (u) measurement

RANKING OF VISUALLY OBSERVABLE CONTAMINATION AND ODOUR (for specific soil contamination assessment

R = 0	No visible evidence of contamination	R = A	No non-natural odours identified
R = 1	Slight evidence of visible contamination	R = B	Slight non-natural odours identified
R = 2	Visible contamination	R = C	Moderate non-natural odours identified
R = 3	Significant visible contamination	R = D	Strong non-natural odours identified

ROCK CORE RECOVERY

TCR = Total Core Recovery (%)

$$= \frac{\text{Length of core recevered}}{\text{Lengh of core run}} \text{ x } 100$$

SCR = Solid Core Recovery (%)

$$= \frac{\Sigma \text{ Length ofcylindrical core recevered}}{\text{Lengh of core run}} \text{ x } 100$$

RQD = Rock Quality Designation (%)

$$= \frac{\Sigma \text{Axial Lenghts of core} > 100\text{mm}}{\text{Lengh of core run}} \text{ x } 100$$

MATERIAL BOUNDARIES

———— = inferred boundary

- - - - - - - - = probable boundary

— ?— ?— ?— ? = possible boundary

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METHOD OF SOIL DESCRIPTION USED ON BOREHOLE AND TEST PIT LOGS

	FILL		ORGANIC SOILS (OL, OH or Pt)		CLAY (CL, CI or CH)
	COUBLES or BOULDERS		SILT (ML or MH)		SAND (SP or SW)
	GRAVEL (GP or GW)	Combinations of these basic symbols may be used to indicate mixed materials such as sandy clay			

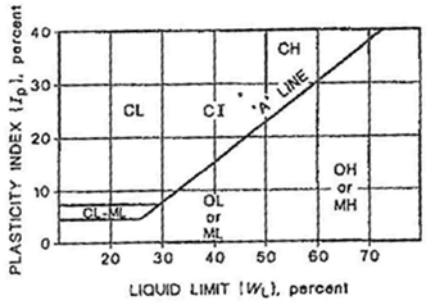
CLASSIFICATION AND INFERRED STRATIGRAPHY

Soil is broadly classified and described in Borehole and Test Pit Logs using the preferred method given in AS1726 – 1993, (Amdt1 – 1994 and Amdt2 – 1994), Appendix A. Material properties are assessed in the field by visual/tactile methods.

PARTICLE SIZE CHARACTERISTICS

Major Division	Sub Division	Particle Size
BOULDERS		>200 mm
COBBLES		63 to 200 mm
GRAVEL	Coarse	20 to 63 mm
	Medium	6 to 20 mm
	Fine	2 to 6 mm
SAND	Coarse	0.6 to 2 mm
	Medium	0.2 to 0.6 mm
	Fine	0.075 to 0.2mm
SILT		0.002 to 0.075 mm
CLAY		<0.002 mm

PLASTICITY PROPERTIES



USCS SYMBOLS

Major Divisions		Symbol	Description
COARSE GRAINED SOILS More than 50% by dry mass less than 63mm is greater than 0.075mm	More than 50% of coarse grains are >2.mm	GW	Well graded gravel and gravel-sand mixtures, little or no fines.
		GP	Poorly graded gravel and gravel-sand mixtures, little or no fines.
		GM	Silty gravel, gravel-sand-silt mixtures.
		GC	Clayey gravel, gravel-sand-clay mixtures.
	More than 50% of coarse grains are <2 mm	SW	Well graded sand and gravelly sand, little or no fines.
		SP	Poorly graded sand and gravelly sand, little or no fines.
		SM	Silty sand, sand-silt mixtures.
		SC	Clayey sand, sandy-clay mixtures.
FINE GRAINED SOILS More than 50% by dry mass less than 63mm is less than 0.075mm	Liquid Limit less < 50%	ML	Inorganic silts of low plasticity, very fine sands, rock flour, silty or clayey fine sands.
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays.
		OL	Organic silts and organic silty clays of low plasticity.
	Liquid Limit > than 50%	MH	Inorganic silts of high plasticity.
		CH	Inorganic clays of high plasticity.
		OH	Organic clays of medium to high plasticity.
		PT	Peat muck and other highly organic soils.

MOISTURE CONDITION

Symbol	Term	Description
D	Dry	Sands and gravels are free flowing. Clays & Silts may be brittle or friable and powdery.
M	Moist	Soils are darker than in the dry condition & may feel cool. Sands and gravels tend to cohere.
W	Wet	Soils exude free water. Sands and gravels tend to cohere.

Moisture content of cohesive soils may also be described in relation to plastic limit (WP) or liquid limit (WL) [» much greater than, > greater than, < less than, « much less than].

CONSISTENCY

Symbol	Term	Undrained Shear Strength
VS	Very Soft	0. to 12 kPa
S	Soft	12 to 25 kPa
F	Firm	25 to 50 kPa
St	Stiff	50 to 100 kPa
VSt	Very Stiff	100 to 200 kPa
H	Hard	Above 200 kPa

DENSITY

Symbol	Term	Density Index %	SPT "N" #
VL	Very Loose	< 15	0 to 4
L	Loose	15 to 35	4 to 10
MD	Medium Density	35 to 65	10 to 30
D	Dense	65 to 85	30 to 50
VD	Very Dense	Above 85	Above 50

In the absence of test results, consistency and density may be assessed from correlations with the observed behaviour of the material.
SPT correlations are not stated in AS1726 – 1993, and may be subject to corrections for overburden pressure and equipment type.

MINOR COMPONENTS

Term	Assessment Guide	Proportion by Mass
Trace	Presence just detectable by feel or eye but soil properties little or no different to general properties of primary component	Coarse grained soils: ≤ 5% Fine grained soil: ≤15%
Some	Presence easily detectable by feel or eye but soil properties little or no different to general properties of primary component	Coarse grained soils: 5 - 12% Fine grained soil: 15 - 30%

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TERMS FOR ROCK MATERIAL STRENGTH AND WEATHERING

CLASSIFICATION AND INFERRED STRATIGRAPHY
Soil is broadly classified and described in Borehole and Test Pit Logs using the preferred method given in AS1726 – 1993, (Amdt1 – 1994 and Amdt2 – 1994), Appendix A. Material properties are assessed in the field by visual/ tactile methods.

STRENGTH

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

 # Rock Strength Test Results

▼ Point Load Strength Index, $Is_{(50)}$, Axial test (MPa)

◀ Point Load Strength Index, $Is_{(50)}$, Diametral test (MPa)

Relationship between rock strength test result ($Is_{(50)}$) and unconfined compressive strength (UCS) will vary with rock type and strength, and should be determined on a site-specific basis. UCS is typically 10 to 30 x $Is_{(50)}$, but can be as low as 5 MPa.

ROCK MATERIAL WEATHERING

Symbol		Term	Field Guide
RS		Residual Soil	Soil developed on extremely weathered rock; the mass structure and substance fabric are no longer evident; there is a large change in volume but the soil has not been significantly transported.
EW		Extremely Weathered	Rock is weathered to such an extent that it has soil properties - i.e. it either disintegrates or can be remoulded, in water.
DW	HW	Distinctly Weathered	Rock strength usually changed by weathering. The rock may be highly discoloured, usually by iron staining. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores. In some environments it is convenient to subdivide into Highly Weathered and Moderately Weathered, with the degree of alteration typically less for MW.
	MW		
SW		Slightly Weathered	Rock slightly discoloured but shows little or no change of strength relative to fresh rock.
FR		Fresh	Rock shows no sign of decomposition or staining.

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ABBREVIATIONS AND DESCRIPTIONS FOR ROCK MATERIAL AND DEFECTS

CLASSIFICATION AND INFERRED STRATIGRAPHY

Rock is broadly classified and described in Borehole Logs using the preferred method given in AS1726 – 1993, (Amdt1 – 1994 and Amdt2 – 1994), Appendix A. Material properties are assessed in the field by visual/ tactile methods.

ROCK MATERIAL DESCRIPTION

Layering

Term	Description
Massive	No layering apparent
Poorly Developed	Layering just visible; little effect on properties
Well Developed	Layering (bedding, foliation, cleavage) distinct; rock breaks more easily parallel to layering

Structure

Term	Spacing (mm)
Thinly laminated	<6
Laminated	6 – 20
Very thinly bedded	20 – 60
Thinly bedded	60 – 200
Medium bedded	200 – 600
Thickly bedded	600 – 2,000
Very thickly bedded	> 2,000

ABBREVIATIONS AND DESCRIPTIONS FOR DEFECT TYPES

Defect Type	Abbr.	Description
Joint	JT	Surface of a fracture or parting, formed without displacement, across which the rock has little or no tensile strength. May be closed or filled by air, water or soil or rock substance, which acts as cement.
Bedding Parting	BP	Surface of fracture or parting, across which the rock has little or no tensile strength, parallel or sub-parallel to layering/ bedding. Bedding refers to the layering or stratification of a rock, indicating orientation during deposition, resulting in planar anisotropy in the rock material.
Foliation	FL	Repetitive planar structure parallel to the shear direction or perpendicular to the direction of higher pressure, especially in metamorphic rock, e.g. Schistosity (SH) and Gneissosity.
Contact	CO	The surface between two types or ages of rock.
Cleavage	CL	Cleavage planes appear as parallel, closely spaced and planar surfaces resulting from mechanical fracturing of rock through deformation or metamorphism, independent of bedding.
Sheared Seam/ Zone (Fault)	SS/SZ	Seam or zone with roughly parallel almost planar boundaries of rock substance cut by closely spaced (often <50 mm) parallel and usually smooth or slickensided joints or cleavage planes.
Crushed Seam/ Zone (Fault)	CS/CZ	Seam or zone composed of disoriented usually angular fragments of the host rock substance, with roughly parallel near-planar boundaries. The brecciated fragments may be of clay, silt, sand or gravel sizes or mixtures of these.
Decomposed Seam/ Zone	DS/DZ	Seam of soil substance, often with gradational boundaries, formed by weathering of the rock material in places.
Infilled Seam	IS	Seam of soil substance, usually clay or clayey, with very distinct roughly parallel boundaries, formed by soil migrating into joint or open cavity.
Schistocity	SH	The foliation in schist or other coarse grained crystalline rock due to the parallel arrangement of platy or prismatic mineral grains, such as mica.
Vein	VN	Distinct sheet-like body of minerals crystallised within rock through typically open-space filling or crack-seal growth.

ABBREVIATIONS AND DESCRIPTIONS FOR DEFECT SHAPE AND ROUGHNESS

Shape	Abbr.	Description	Roughness	Abbr.	Description
Planar	Pl	Consistent orientation	Polished	Pol	Shiny smooth surface
Curved	Cu	Gradual change in orientation	Slickensided	SL	Grooved or striated surface, usually polished
Undulating	Un	Wavy surface	Smooth	S	Smooth to touch. Few or no surface irregularities
Stepped	St	One or more well defined steps	Rough	RF	Many small surface irregularities (amplitude generally <1mm). Feels like fine to coarse sandpaper
Irregular	Ir	Many sharp changes in orientation	Very Rough	VR	Many large surface irregularities, amplitude generally >1mm. Feels like very coarse sandpaper

Orientation: **Vertical Boreholes –** The dip (inclination from horizontal) of the defect.
Inclined Boreholes – The inclination is measured as the acute angle to the core axis.

ABBREVIATIONS AND DESCRIPTIONS FOR DEFECT COATING

Coating	Abbr.	Description
Clean	CN	No visible coating or infilling
Stain	SN	No visible coating but surfaces are discoloured by staining, often limonite (orange-brown)
Veneer	VNR	A visible coating of soil or mineral substance, usually too thin to measure (< 1 mm); may be patchy

DEFECT APERTURE

Aperture	Abbr.	Description
Closed	CL	Closed.
Open	O	Without any infill material.
Infilled	-	Soil or rock i.e. clay, talc, pyrite, quartz, etc.

APPENDIX D
Field Data Sheets

APPENDIX E

Chain of Custody and Sample Receipt Forms

SAMPLE RECEIPT ADVICE

SE147094

CLIENT DETAILS

Contact	Jessie Sixsmith
Client	Environmental Investigations
Address	Suite 6.01, 55 Miller Street NSW 2009
Telephone	02 9516 0722
Facsimile	02 9516 0741
Email	Jessie.Sixsmith@eiaustralia.com.au
Project	**E22817 37-39 Pavesi St, Guildford West**
Order Number	**E22817**
Samples	34

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 11/12/2015
Report Due	Fri 18/12/2015
SGS Reference	**SE147094**

SUBMISSION DETAILS

This is to confirm that 34 samples were received on Friday 11/12/2015. Results are expected to be ready by Friday 18/12/2015. Please quote SGS reference SE147094 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Sample counts by matrix	33 Soils, 1 Water	Type of documentation received	COC
Date documentation received	11/12/2015	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	11.6°C
Sample container provider	SGS	Turnaround time requested	Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	Ice Bricks	Samples clearly labelled	Yes
Complete documentation received	Yes		

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

COMMENTS

35 soil samples unmarked for analyses on the COC have been placed on hold.
Asbestos will be sub sampled from the jar provided for sample BH104M_0.0-0.1, as a separate bag was not supplied for analysis.

SAMPLE RECEIPT ADVICE

SE147094

CLIENT DETAILS

Client Environmental Investigations

Project E22817 37-39 Pavesi St, Guildford West

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 Metals in Soil by ICPOES	TRH (Total Recoverable Hydrocarbons) in Soil	VOC's in Soil	Volatile Petroleum Hydrocarbons in Soil
001	BH101_0.0-0.1	28	13	25	11	7	10	12	8
002	BH101_0.4-0.5	-	-	25	-	7	10	12	8
003	BH102_0.0-0.1	28	13	25	11	7	10	12	8
004	BH103_0.0-0.1	28	13	25	11	7	10	12	8
006	BH104M_0.4-0.5	28	13	25	11	7	10	12	8
007	BH105_0.0-0.1	28	13	25	11	7	10	12	8
009	BH106M_0.6-0.7	28	13	25	11	7	10	12	8
010	BH106M_0.9-1.0	-	-	25	-	7	10	12	8
011	BH107_0.2-0.3	28	13	25	11	7	10	12	8
012	BH108_0.2-0.3	28	13	25	11	7	10	12	8
013	BH109_0.2-0.3	28	13	25	11	7	10	12	8
014	BH109_0.7-0.8	-	-	25	-	7	10	12	8
015	BH110_0.3-0.4	28	13	25	11	7	10	12	8
016	BH111_0.2-0.3	28	13	25	11	7	10	12	8
017	BH111_1.1-1.2	-	-	25	-	7	10	12	8
018	BH112_0.2-0.3	28	13	25	11	7	10	12	8
019	BH113_0.2-0.3	28	13	25	11	7	10	12	8
020	BH114_0.2-0.3	28	13	25	11	7	10	12	8
021	BH114_1.0-1.1	-	-	25	-	7	10	12	8
022	BH115_0.2-0.3	28	13	25	11	7	10	12	8
023	BH115_0.5-0.6	-	-	25	-	7	10	12	8
024	BH116_0.2-0.3	28	13	25	11	7	10	12	8

CONTINUED OVERLEAF

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

SAMPLE RECEIPT ADVICE

SE147094

CLIENT DETAILS

Client Environmental Investigations

Project E22817 37-39 Pavesi St, Guildford West

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 Metals in Soil by ICPOES	TRH (Total Recoverable Hydrocarbons) in Soil	VOC's in Soil	Volatile Petroleum Hydrocarbons in Soil
025	BH117_0.0-0.1	28	13	25	11	7	10	12	8
026	BH117M_1.0-1.1	-	-	25	-	7	10	12	8
028	BH118_0.4-0.8	28	13	25	11	7	10	12	8
029	BH119_0.0-0.1	28	13	25	11	7	10	12	8
030	QD-01	-	-	-	-	7	10	12	8
032	Trip Blank	-	-	-	-	-	-	12	-
033	SP1-1	28	13	25	11	7	10	12	8
034	SP1-2	28	13	25	11	7	10	12	8

CONTINUED OVERLEAF

The above table represents SGS Environmental Services' interpretation of the client-supplied Chain Of Custody document.
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SAMPLE RECEIPT ADVICE

SE147094

CLIENT DETAILS

Client Environmental Investigations

Project E22817 37-39 Pavesi St, Guildford West

SUMMARY OF ANALYSIS

No.	Sample ID	Fibre Identification in soil	Mercury in Soil	Moisture Content
001	BH101_0.0-0.1	2	1	1
002	BH101_0.4-0.5	-	1	1
003	BH102_0.0-0.1	2	1	1
004	BH103_0.0-0.1	2	1	1
005	BH104M_0.0-0.1	2	-	-
006	BH104M_0.4-0.5	-	1	1
007	BH105_0.0-0.1	2	1	1
008	BH106M_0.2-0.3	2	-	-
009	BH106M_0.6-0.7	-	1	1
010	BH106M_0.9-1.0	-	1	1
011	BH107_0.2-0.3	2	1	1
012	BH108_0.2-0.3	2	1	1
013	BH109_0.2-0.3	2	1	1
014	BH109_0.7-0.8	-	1	1
015	BH110_0.3-0.4	2	1	1
016	BH111_0.2-0.3	2	1	1
017	BH111_1.1-1.2	-	1	1
018	BH112_0.2-0.3	2	1	1
019	BH113_0.2-0.3	2	1	1
020	BH114_0.2-0.3	2	1	1
021	BH114_1.0-1.1	-	1	1
022	BH115_0.2-0.3	2	1	1
023	BH115_0.5-0.6	-	1	1
024	BH116_0.2-0.3	2	1	1

CONTINUED OVERLEAF

The above table represents SGS Environmental Services' interpretation of the client-supplied Chain Of Custody document.
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SAMPLE RECEIPT ADVICE

SE147094

CLIENT DETAILS

Client Environmental Investigations

Project E22817 37-39 Pavesi St, Guildford West

SUMMARY OF ANALYSIS

No.	Sample ID	Fibre Identification in soil	Mercury in Soil	Moisture Content	TRH (Total Recoverable Hydrocarbons) in Water	VOCs in Water	Volatile Petroleum Hydrocarbons in Water
025	BH117_0.0-0.1	2	1	1	-	-	-
026	BH117M_1.0-1.1	-	1	1	-	-	-
027	BH118_0.0-0.1	2	-	-	-	-	-
028	BH118_0.4-0.8	-	1	1	-	-	-
029	BH119_0.0-0.1	2	1	1	-	-	-
030	QD-01	-	1	1	-	-	-
031	QR-01	-	-	-	9	12	8
032	Trip Blank	-	-	1	-	-	-
033	SP1-1	2	1	1	-	-	-
034	SP1-2	2	1	1	-	-	-

CONTINUED OVERLEAF

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

SAMPLE RECEIPT ADVICE

SE147094

CLIENT DETAILS

Client Environmental Investigations

Project E22817 37-39 Pavesi St, Guildford West

SUMMARY OF ANALYSIS

No.	Sample ID	Mercury (dissolved) in Water	Trace Metals (Dissolved) in Water by ICPMS
031	QR-01	1	7

The above table represents SGS Environmental Services' 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 1 of 6

Site: 37-39 Pavesi Street Guildford West NSW

Project No: E22817

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

Sample ID	Laboratory ID	Container Type	Sampling Date	Sampling Time	Sample Matrix: WATER	SOIL	OTHERS (i.e. Fibro, Paint, etc.)	Analysis: HM [A] /TRH/BTEX/PAHs OCP/OP/PCB/	HM [A] /TRH/BTEX/PAHs	HM [A] /TRH/BTEX	TRH/BTEX/Lead	TRH/BTEX	PAHs	VOCs	Asbestos	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	sPOCAS	Hold			TCLP PAHs	TCLP HM [A]	TCLP HM [B]
BH101_0.0-0.1	1	ZLB, J	10-12-15	Am/pm		✓		✓							✓									
BH101_0.4-0.5	2	J	↓	↓		✓			✓															
BH101_0.9-1.0		J				✓													✓					
BH102_0.0-0.1	3	ZLB, J				✓		✓							✓									
BH102_0.6-0.7		J				✓													✓					
BH102_0.9-1.0		J				✓													✓					
BH103_0.0-0.1	4	ZLB, J				✓		✓							✓									
BH103_0.5-0.6		J				✓													✓					
BH104M_0.0-0.1	5	J				✓									✓									
BH104M_0.4-0.5	6	J				✓		✓																
BH104M_0.8-0.9		J				✓													✓					
BH104M_1.2-1.3		J	↓	↓		✓													✓					

Comments

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

HM [B]
Arsenic
Cadmium
Chromium
Lead
Mercury
Nickel

LABORATORY TURNAROUND

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

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

Sampler's Comments:

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

SGS Alexandria Environmental

SE147094 COC
Received: 11 – Dec – 2015

Sampler's Name (EI):	Received by (SGS):
JS/BA	
Print: JESSIE SIXSMITH	Print: JAMES ARMAND
Signature:	Signature:
Date: 11-12-15	Date: 11/12/15 4pm

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

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

Sheet 2 of 6

Site: 37-39 Pavesi Street Guildford West NSW

Project No: E22817

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

Sample ID	Laboratory ID	Container Type	Sampling Date	Sampling Time	Sample Matrix: WATER	SOIL	OTHERS (i.e. Fibro, Paint, etc.)	Analysis: HM A /TRH/BTEX/PAHs OCP/OP/PCB	HM A /TRH/BTEX/PAHs	HM A /TRH/BTEX	TRH/BTEX/Lead	TRH/BTEX	PAHs	VOCs	Asbestos	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	sPOCAS	Hold			TCLP PAHs	TCLP HM A	TCLP HM B
BH105_0.0-0.1	7	ZLB, J	10-12-15	Am/pm		✓		✓							✓									
BH105_0.6-0.7		J				✓													✓					
BH105_0.8-0.9		J				✓													✓					
BH105_1.4-1.5		J				✓													✓					
BH106m_0.2-0.3	8	ZLB, J				✓									✓									
BH106m_0.6-0.7	9	J				✓		✓																
BH106m_0.9-1.0	10	J				✓			✓															
BH106m_1.7-1.8		J				✓													✓					
BH106m_2.0-2.1		J				✓													✓					
BH106m_3.0-3.1		J				✓													✓					
BH106m_4.0-4.1		J				✓													✓					
BH107_0.2-0.3	11	J, ZLB	↓	↓		✓		✓							✓									

Comments

HM A
Arsenic
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
ZinC

HM B
Arsenic
Cadmium
Chromium
Lead
Mercury
Nickel

LABORATORY TURNAROUND

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

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

Sampler's Comments:

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

Sampler's Name (EI): JS/BA

Print: JESSIE SIXSMITH

Signature: Smith

Date: 11-12-15

Received by (SGS):

Print: JULIUS ALVARO

Signature:

Date: 11/12/15 4PM

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

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

Sheet 3 of 6

Site: 37-39 Pavesi Street Guildford West NSW

Project No: E22817

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

Sample ID	Laboratory ID	Container Type	Sampling Date	Sampling Time	Sample Matrix: WATER	SOIL	OTHERS (i.e. Fibro, Paint, etc.)	Analysis: HM [A] /TRH/BTEX/PAHs OCP/OP/PCB	HM [A] /TRH/BTEX/PAHs	HM [A] /TRH/BTEX	TRH/BTEX/Lead	TRH/BTEX	PAHs	VOCs	Asbestos	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	sPOCAS	Hold			TCLP PAHs	TCLP HM [A]	TCLP HM [B]
BH107_0.8-0.9		J	10-12-15	Am/pm		✓													✓					
BH107_1.5-1.6		J	↓	↓		✓													✓					
BH108_0.2-0.3	12	ZLB, J				✓		✓							✓									
BH108_0.8-0.9		J				✓													✓					
BH108_1.5-1.6		J				✓													✓					
BH109_0.2-0.3	13	ZLB, J				✓		✓							✓									
BH109_0.7-0.8	14	J				✓			✓															
BH109_1.4-1.5		J				✓													✓					
BH110_0.2-0.3		ZLB, J				✓													✓					
BH110_0.3-0.4	15	ZLB, J				✓		✓							✓									
BH110_0.6-0.7		J				✓													✓					
BH110_0.9-1.0		J	↓	↓		✓													✓					

Comments

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

HM [B]
Arsenic
Cadmium
Chromium
Lead
Mercury
Nickel

LABORATORY TURNAROUND

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

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

Sampler's Comments:

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

Sampler's Name (EI): JS/BA

Print: JESSIE SIXSMITH

Signature: Smith

Date: 11-12-15

Received by (SGS):

Print: JUCIUS ALVAZ

Signature:

Date: 11/12/15 4PM

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

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

Sheet 4 of 6

Site: 37-39 Pavesi Street Guildford West NSW

Project No: E22817

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

Sample ID	Laboratory ID	Container Type	Sampling Date	Sampling Time	WATER	SOIL	OTHERS (i.e. Fibro, Paint, etc.)	HM [A] /TRH/BTEX/PAHs OCP/OP/PCB/	HM [A] /TRH/BTEX/PAHs	HM [A] /TRH/BTEX	TRH/BTEX/Lead	TRH/BTEX	PAHs	VOCs	Asbestos	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	sPOCAS	Hold			TCLP PAHs	TCLP HM [A]	TCLP HM [B]
BH110_1.9-2.0		J	10-12-15	Am/pm		✓													✓						
BH111_0.2-0.3	16	ZLB, J				✓		✓							✓										
BH111_0.5-0.6		J, ZLB				✓													✓						
BH111_1.1-1.2	17	J				✓			✓																
BH111_1.9-2.0		J				✓													✓						
BH112_0.2-0.3	18	ZLB, J				✓		✓							✓										
BH112_0.8-0.9		J				✓													✓						
BH113_0.2-0.3	19	ZLB, J				✓		✓							✓										
BH113_0.7-0.8		J				✓													✓						
BH114_0.2-0.3	20	ZLB, J				✓		✓							✓										
BH114_0.5-0.6		J				✓													✓						
BH114_1.0-1.1	21	J	↓	↓		✓			✓																

Comments

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

HM [B]
Arsenic
Cadmium
Chromium
Lead
Mercury
Nickel

LABORATORY TURNAROUND

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

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

Sampler's Comments:

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

Sampler's Name (EI): JS/BA

Print: JESSIE SIXSMITH

Signature: JSmith

Date: 11-12-15

Received by (SGS):

Print: JUCILO ALVAR

Signature:

Date: 11/12/15 4PM

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

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

Sheet 5 of 6

Site: 37-39 Pavesi Street Guildford West NSW

Project No: E22817

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

Sample ID	Laboratory ID	Container Type	Sampling Date	Sampling Time	WATER	SOIL	OTHERS (i.e. Fibro, Paint, etc.)	HM A /TRH/BTEX/PAHs OCP/OP/PCB/	HM A /TRH/BTEX/PAHs	HM A /TRH/BTEX	TRH/BTEX/Lead	TRH/BTEX	PAHs	VOCs	Asbestos	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	sPOCAS	Hold			TCLP PAHs	TCLP HM A	TCLP HM B
BH114_1.6-1.7		J	10-12-15	AM/pm		✓													✓					
BH115_0.2-0.3	22	ZLB, J				✓		✓							✓									
BH115_0.5-0.6	23	J				✓			✓															
BH115_1.1-1.2		J				✓													✓					
BH116_0.2-0.3	24	ZLB, J				✓		✓							✓									
BH116_0.6-0.7		J				✓													✓					
BH117_0.0-0.1	25	ZLB, J				✓		✓							✓									
BH117M_0.4-0.5		J				✓													✓					
BH117M_1.0-1.1	26	J				✓			✓															
BH117M_1.6-1.7		J				✓													✓					
BH118_0.0-0.1	27	ZLB, J				✓									✓									
BH118_0.4-0.5	28	J	↓	↓		✓		✓																

Comments

HM A: Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, ZinC

HM B: Arsenic, Cadmium, Chromium, Lead, Mercury, Nickel

LABORATORY TURNAROUND

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

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

Sampler's Name (EI): JS/BA

Print: JESSIE SIXSMITH

Signature: [signature]

Date: 11-12-15

Received by (SGS):

Print: [illegible]

Signature: [signature]

Date: 11/12/15 4pm

Sampler's Comments:

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

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

Environmental Investigations Australia
Contamination | Remediation | Geotechnical
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PYRMONT NSW 2009
Ph: 9516 0722
lab@eiaustralia.com.au

COC July 2014 FORM v.2 - SGS

Sheet 6 of 6

Site: 37-39 Pavesi Street Guildford West NSW

Project No: E22817

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

Sample ID	Laboratory ID	Container Type	Sampling Date	Sampling Time	Sample Matrix: WATER	SOIL	OTHERS (i.e. Fibro, Paint, etc.)	Analysis: HM [A] /TRH/BTEX/PAHs OCP/OP/PCB/Asbestos	HM [A] /TRH/BTEX/PAHs	HM [A] /TRH/BTEX	TRH/BTEX/Lead	BTEX	PAHs	VOCs	Asbestos	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	sPOCAS	Hold			TCLP PAHs	TCLP HM [A]	TCLP HM [B]
BH118-1.0-1.1		J	10-12-15	Amjen		✓													✓					
BH118-1.5-1.6		J				✓													✓					
BH119-0.0-0.1	29	2LB, J				✓		✓																
QD-01	30	J				✓				✓														
QD-02		J				✓													✓					
QR-01	31	VCx2, P, S			✓					✓														
TripBlank	32	J				✓						✓												
SP1-1	33	J, 2LB				✓		✓																
SP1-2	34	J, 2LB				✓		✓																

Comments

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

HM [B]
Arsenic
Cadmium
Chromium
Lead
Mercury
Nickel

LABORATORY TURNAROUND

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

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

Sampler's Comments:

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

Sampler's Name (EI): JS/BA

Print: JESSIE SIXSMITH

Signature:

Date: 11-12-15

Received by (SGS):

Print:

Signature:

Date: 12/15 HPA

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

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

AU.SampleReceipt.Sydney (Sydney)

From: Jessie Sixsmith - Environmental Investigations [jessie.sixsmith@eiaustralia.com.au]
Sent: Monday, 21 December 2015 2:37 PM
To: AU.Environmental.Sydney (Sydney); AU.SampleReceipt.Sydney (Sydney)
Subject: RE: Report Job SE147094, your reference E22817 37-39 Pavesi St, Guildford West, order number E22817

Hi SGS,

Can I please get the following additional analysis undertaken on a standard TAT:

- BH114_1.6-1.7 - TRH
- BH117M_1.0-1.1 - asbestos
- BH118_1.0-1.1 - asbestos

Kind regards,

Jessie Sixsmith | Environmental Scientist Environmental Investigations Australia Pty Ltd Suite 6.01, 55 Miller Street, Pyrmont NSW 2009 T 02 9516 0722 |M 0434 851 353| F 02 9518 5088 W www.eiaustralia.com.au | E jessie.sixsmith@eiaustralia.com.au

-----Original Message-----
From: AU.Environmental.Sydney@SGS.com [mailto:AU.Environmental.Sydney@SGS.com]
Sent: Friday, 18 December 2015 3:56 PM
To: Jessie Sixsmith - Environmental Investigations; Laboratory Results - Environmental Investigations
Subject: Report Job SE147094, your reference E22817 37-39 Pavesi St, Guildford West, order number E22817

Dear Jessie,

Please find attached the report for SGS job SE147094, your reference E22817 37-39 Pavesi St, Guildford West, order number E22817.

-IMPORTANT INFORMATION ABOUT YOUR REPORT-
To align with NEPM 1999 (2013), SGS Environmental has changed the way Silica Gel Clean-up of TRH extracts is reported. TPH Silica Gel has now become TRH - Silica. NEPM 1999(2013) seeks to clarify TRH and TPH in Schedule B3, 10.2.7.

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

Regards,
Erin Adams

SAMPLE RECEIPT ADVICE

SE147094A

CLIENT DETAILS

Contact	Jessie Sixsmith
Client	Environmental Investigations
Address	Suite 6.01, 55 Miller Street NSW 2009
Telephone	02 9516 0722
Facsimile	02 9516 0741
Email	Jessie.Sixsmith@eiaustralia.com.au
Project	**E22817 37-39 Pavesi St Guildford - Add**
Order Number	**E22817**
Samples	36

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 21/12/2015
Report Due	Wed 30/12/2015
SGS Reference	**SE147094A**

SUBMISSION DETAILS

This is to confirm that 36 samples were received on Monday 21/12/2015. Results are expected to be ready by Wednesday 30/12/2015. Please quote SGS reference SE147094A when making enquiries. Refer below for details relating to sample integrity upon receipt.

Sample counts by matrix	3 Soils	Type of documentation received	Email
Date documentation received	21/12/15@2:37pm	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	11.6°C
Sample container provider	SGS	Turnaround time requested	Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	Ice Bricks	Samples clearly labelled	Yes
Complete documentation received	Yes		

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

COMMENTS

Asbestos will be sub sampled from the jar provided for sample BH104M_0.0-0.1, as a separate bag was not supplied for analysis.

SAMPLE RECEIPT ADVICE

SE147094A

CLIENT DETAILS

Client Environmental Investigations

Project E22817 37-39 Pavesi St Guildford - Add

SUMMARY OF ANALYSIS

No.	Sample ID	Fibre Identification in soil	Moisture Content	TRH (Total Recoverable Hydrocarbons) in Soil	Volatile Petroleum Hydrocarbons in Soil
026	BH117M_1.0-1.1	2	-	-	-
035	BH114_1.6-1.7	-	1	10	8
036	BH118_1.0-1.1	2	-	-	-

The above table represents SGS Environmental Services' 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 1 of 1

Site: 37-39 Pavesi Street
Guildford West NSW

Project No: E22817

Laboratory: Envirolab Services
12 Ashley Street
CHATSWOOD NSW 2067
P: 02 9910 6200

Sample ID	Laboratory ID	Container Type	Sampling Date	Sampling Time	WATER	SOIL	OTHERS (i.e. Fibro, Paint, etc.)	HM [A] /TRH/BTEX/PAHs OCP/OP/PCB/Asbestos	HM [A] /TRH/BTEX/PAHs	HM [A] /TRH/BTEX	TRH/BTEX/Lead	TRH/BTEX	PAHs	VOCs	Asbestos	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	sPOCAS	Hold				TCLP PAHs	TCLP HM [B]
QT-01	1	J	10-12-15	AM/PM		✓			✓															
QT-02	2	J	10-12-15	AM/PM		✓													✓					

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

Job No: 139015
Date Received: 11/12/2015
Time Received: 14.50
Received by: PC
Temp: Cool/Ambient 12.6
Cooling: Ice/Icepack
Security: Intact/Broken/None

Comments

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

HM [B]
Arsenic
Cadmium
Chromium
Lead
Mercury
Nickel

LABORATORY TURNAROUND

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

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

Sampler's Comments:

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

Sampler's Name (EI):	Received by (Envirolab):
JS/BA	P.Ray
Print: Jessie Symsmith	Print:
Signature:	Signature:
Date: 11-12-15	Date: 11/12/2015 14.50

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

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

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

SAMPLE RECEIPT ADVICE

Client Details	
Client	Environmental Investigations
Attention	Jessie Sixsmith

Sample Login Details	
Your Reference	E22817, Guildford West
Envirolab Reference	**139015**
Date Sample Received	11/12/2015
Date Instructions Received	11/12/2015
Date Results Expected to be Reported	**18/12/2015**

Sample Condition	
Samples received in appropriate condition for analysis	YES
No. of Samples Provided	2 Soils
Turnaround Time Requested	Standard
Temperature on receipt (°C)	12.6
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments
Samples will be held for 1 month for water samples and 2 months for soil samples from date of receipt of samples

Please direct any queries to:

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

Sample and Testing Details on following page

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

Sample Id	*vTRH(C6-C10)/BTEXN in Soil*	*svTRH (C10-C40) in Soil*	*PAHs in Soil*	*Acid Extractable metals in soil*	*On Hold*
QT-01	✓	✓	✓	✓	
QT-02					✓

Sheet 1 of 1

Site: 37 - 39 Pavesi Street, Guildford West

Project No: E22817

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

Sample ID	Laboratory ID	Container Type	Sampling Date	Sampling Time	Sample Matrix: WATER	SOIL	OTHERS (i.e. Fibro, Paint, etc.)	Analysis: HM [A] /TRH/BTEX/PAHs OCP/OP/PCB/Asbestos	HM [A] /TRH/BTEX/PAHs/VOCs	HM [A] /TRH/BTEX	TRH/BTEX/Lead	TRH/BTEX	PAHs	VOCs	Asbestos	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	sPOCAS				TCLP PAHs	TCLP HM [A]	TCLP HM [B]
BH104M	1	S,P,VC×2	15-12-15	AM/PM	✓				✓															
BH106M	2	↓	↓	↓	✓				✓															
BH117M	3				✓				✓															
GWQP-1	4				✓					✓														
QR-2	5	↓			✓					✓														
TripSpike	6	VC	↓	↓	✓							✓												

Comments

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

HM [B]
Arsenic
Cadmium
Chromium
Lead
Mercury
Nickel

LABORATORY TURNAROUND

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

SGS Alexandria Environmental

SE147250 COC

Received: 16 – Dec – 2015

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

Sampler's Comments:

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

Sampler's Name (EI):

Print: Jessie Sixsmith

Signature:

Date: 16-12-15

Received by (SGS):

Print: JULIUS AWAN

Signature:

Date: 16/12/15 4:10 PM

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

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

SAMPLE RECEIPT ADVICE

SE147250

CLIENT DETAILS

Contact	Jessie Sixsmith
Client	Environmental Investigations
Address	Suite 6.01, 55 Miller Street NSW 2009
Telephone	02 9516 0722
Facsimile	02 9516 0741
Email	Jessie.Sixsmith@eiaustralia.com.au
Project	**E22817 - Pavesi Street Guildford West**
Order Number	**E22817**
Samples	6

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 16/12/2015
Report Due	Wed 23/12/2015
SGS Reference	**SE147250**

SUBMISSION DETAILS

This is to confirm that 6 samples were received on Wednesday 16/12/2015. Results are expected to be ready by Wednesday 23/12/2015.
Please quote SGS reference SE147250 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Sample counts by matrix	6 Waters	Type of documentation received	COC
Date documentation received	16/12/2015	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	8.7°C
Sample container provider	SGS	Turnaround time requested	Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	Ice Bricks	Samples clearly labelled	Yes
Complete documentation received	Yes		

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

COMMENTS

Job Details : 37-39 Pavesi Street Guildford West

SAMPLE RECEIPT ADVICE

SE147250

CLIENT DETAILS

Client Environmental Investigations

Project E22817 - Pavesi Street Guildford West

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	VOCs in Water	Volatile Petroleum Hydrocarbons in Water
001	BH104M	1	22	7	9	79	8
002	BH106M	1	22	7	9	79	8
003	BH117M	1	22	7	9	79	8
004	GWQD-1	1	-	7	9	12	8
005	QR-2	1	-	7	9	12	8
006	Trip Spike	-	-	-	-	12	-

The above table represents SGS Environmental Services' 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 1 of 1

Site: 37-39 Parvesi Street, Guildford West NSW

Project No: E22817

Laboratory: Envirolab Services
12 Ashley Street
CHATSWOOD NSW 2067
P: 02 9910 6200

Sample ID	Laboratory ID	Container Type	Sampling Date	Sampling Time	WATER	SOIL	OTHERS (i.e. Fibro, Paint, etc.)	HM [A] /TRH/BTEX/PAHs OCP/OP/PCB/Asbestos	HM [A] /TRH/BTEX/PAHs	HM [A] /TRH/BTEX	TRH/BTEX/Lead	TRH/BTEX	PAHs	VOCs	Asbestos	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	sPOCAS					TCLP PAHs	TCLP HM [B]
GWQT-1	1-	S,P,2xVC	15-12-15	Am/Pm	X					✓														

Sample Matrix | Analysis

Comments

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

HM [B]
Arsenic
Cadmium
Chromium
Lead
Mercury
Nickel

ENVIROLAB

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

Job No: 139287
Date Received: 17/12
Time Received: 10am
Received by: PH
Temp: Cool/Ambient
Cooling: Ice/Icepack 12°C
Security: Intact/Broken/None

LABORATORY TURNAROUND

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

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

Sampler's Comments:

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

Sampler's Name (EI):	Received by (Envirolab):
Print: Jessie Sixsmith	Print: PH
Signature:	Signature:
Date: 16-12-15	Date: 17/12

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

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

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

SAMPLE RECEIPT ADVICE

Client Details	
Client	Environmental Investigations
Attention	Jessie Sixsmith

Sample Login Details	
Your Reference	E22817, Guildford West
Envirolab Reference	**139287**
Date Sample Received	17/12/2015
Date Instructions Received	17/12/2015
Date Results Expected to be Reported	**04/01/2016**

Sample Condition	
Samples received in appropriate condition for analysis	YES
No. of Samples Provided	1 Water
Turnaround Time Requested	Standard
Temperature on receipt (°C)	12.0
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments
Samples will be held for 1 month for water samples and 2 months for soil samples from date of receipt of samples

Please direct any queries to:

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

Sample and Testing Details on following page

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

Sample Id	*vTRH(C6-C10)/BTEXN in Water*	*svTRH (C10-C40) in Water*	*HM in water - dissolved*
GWQT-1	✓	✓	✓

APPENDIX F
Laboratory Analytical Reports

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Jessie Sixsmith
Client	Environmental Investigations
Address	Suite 6.01, 55 Miller Street NSW 2009
Telephone	02 9516 0722
Facsimile	02 9516 0741
Email	Jessie.Sixsmith@eiaustralia.com.au
Project	**E22817 37-39 Pavesi St, Guildford West**
Order Number	**E22817**
Samples	34

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE147094 R0**
Date Received	11/12/2015
Date Reported	18/12/2015

COMMENTS

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

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

Sample #5: A portion of the sample supplied has been sub-sampled for asbestos according to SGS In-house procedures.
We therefore cannot guarantee that the sub-sample is representative of the entire sample supplied.
SGS Environmental Services recommends supplying approximately 50-100g of sample in a separate container.

Sample #25: 2-4mm length fibre bundles x4 found loose in sample.
Sample #27: 2-8mm length fibre bundles found in 30x20x4mm cement sheet fragment.

Asbestos analysed by Approved Identifier Yusuf Kuthpudin.

SIGNATORIES

Andy Sutton
Senior Organic Chemist

Dong Liang
Metals/Inorganics Team Leader

Kamrul Ahsan
Senior Chemist

Ly Kim Ha
Organic Section Head

Ravee Sivasubramaniam
Asbestos Analyst/Hygiene Team Leader

VOC's in Soil [AN433/AN434] Tested: 14/12/2015

PARAMETER	UOM	LOR	BH101_0.0-0.1 SOIL - 10/12/2015 SE147094.001	BH101_0.4-0.5 SOIL - 10/12/2015 SE147094.002	BH102_0.0-0.1 SOIL - 10/12/2015 SE147094.003	BH103_0.0-0.1 SOIL - 10/12/2015 SE147094.004	BH104M_0.4-0.5 SOIL - 10/12/2015 SE147094.006
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	BH105_0.0-0.1 SOIL - 10/12/2015 SE147094.007	BH106M_0.6-0.7 SOIL - 10/12/2015 SE147094.009	BH106M_0.9-1.0 SOIL - - 10/12/2015 SE147094.010	BH107_0.2-0.3 SOIL - - 10/12/2015 SE147094.011	BH108_0.2-0.3 SOIL - - 10/12/2015 SE147094.012
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	BH109_0.2-0.3 SOIL - 10/12/2015 SE147094.013	BH109_0.7-0.8 SOIL - 10/12/2015 SE147094.014	BH110_0.3-0.4 SOIL - - 10/12/2015 SE147094.015	BH111_0.2-0.3 SOIL - - 10/12/2015 SE147094.016	BH111_1.1-1.2 SOIL - - 10/12/2015 SE147094.017
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	BH112_0.2-0.3 SOIL - 10/12/2015 SE147094.018	BH113_0.2-0.3 SOIL - 10/12/2015 SE147094.019	BH114_0.2-0.3 SOIL - - 10/12/2015 SE147094.020	BH114_1.0-1.1 SOIL - - 10/12/2015 SE147094.021	BH115_0.2-0.3 SOIL - - 10/12/2015 SE147094.022
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

VOC's in Soil [AN433/AN434] Tested: 14/12/2015 (continued)

PARAMETER	UOM	LOR	BH115_0.5-0.6 SOIL - 10/12/2015 SE147094.023	BH116_0.2-0.3 SOIL - 10/12/2015 SE147094.024	BH117_0.0-0.1 SOIL - 10/12/2015 SE147094.025	BH117M_1.0-1.1 SOIL - 10/12/2015 SE147094.026	BH118_0.4-0.8 SOIL - 10/12/2015 SE147094.028
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	BH119_0.0-0.1 SOIL - 10/12/2015 SE147094.029	QD-01 SOIL - 10/12/2015 SE147094.030	Trip Blank SOIL - 10/12/2015 SE147094.032	SP1-1 SOIL - 10/12/2015 SE147094.033	SP1-2 SOIL - 10/12/2015 SE147094.034
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

Volatile Petroleum Hydrocarbons in Soil [AN433/AN434/AN410] Tested: 14/12/2015

PARAMETER	UOM	LOR	BH101_0.0-0.1 SOIL - 10/12/2015 SE147094.001	BH101_0.4-0.5 SOIL - 10/12/2015 SE147094.002	BH102_0.0-0.1 SOIL - 10/12/2015 SE147094.003	BH103_0.0-0.1 SOIL - 10/12/2015 SE147094.004	BH104M_0.4-0.5 SOIL - 10/12/2015 SE147094.006
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25

PARAMETER	UOM	LOR	BH105_0.0-0.1 SOIL - 10/12/2015 SE147094.007	BH106M_0.6-0.7 SOIL - 10/12/2015 SE147094.009	BH106M_0.9-1.0 SOIL - 10/12/2015 SE147094.010	BH107_0.2-0.3 SOIL - 10/12/2015 SE147094.011	BH108_0.2-0.3 SOIL - 10/12/2015 SE147094.012
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25

PARAMETER	UOM	LOR	BH109_0.2-0.3 SOIL - 10/12/2015 SE147094.013	BH109_0.7-0.8 SOIL - 10/12/2015 SE147094.014	BH110_0.3-0.4 SOIL - 10/12/2015 SE147094.015	BH111_0.2-0.3 SOIL - 10/12/2015 SE147094.016	BH111_1.1-1.2 SOIL - 10/12/2015 SE147094.017
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25

PARAMETER	UOM	LOR	BH112_0.2-0.3 SOIL - 10/12/2015 SE147094.018	BH113_0.2-0.3 SOIL - 10/12/2015 SE147094.019	BH114_0.2-0.3 SOIL - 10/12/2015 SE147094.020	BH114_1.0-1.1 SOIL - 10/12/2015 SE147094.021	BH115_0.2-0.3 SOIL - 10/12/2015 SE147094.022
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25

PARAMETER	UOM	LOR	BH115_0.5-0.6 SOIL - 10/12/2015 SE147094.023	BH116_0.2-0.3 SOIL - 10/12/2015 SE147094.024	BH117_0.0-0.1 SOIL - 10/12/2015 SE147094.025	BH117M_1.0-1.1 SOIL - 10/12/2015 SE147094.026	BH118_0.4-0.8 SOIL - 10/12/2015 SE147094.028
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25

PARAMETER	UOM	LOR	BH119_0.0-0.1 SOIL - 10/12/2015 SE147094.029	QD-01 SOIL - 10/12/2015 SE147094.030	SP1-1 SOIL - 10/12/2015 SE147094.033	SP1-2 SOIL - 10/12/2015 SE147094.034
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: 14/12/2015

PARAMETER	UOM	LOR	BH101_0.0-0.1 SOIL - 10/12/2015 SE147094.001	BH101_0.4-0.5 SOIL - 10/12/2015 SE147094.002	BH102_0.0-0.1 SOIL - 10/12/2015 SE147094.003	BH103_0.0-0.1 SOIL - 10/12/2015 SE147094.004	BH104M_0.4-0.5 SOIL - 10/12/2015 SE147094.006
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 (F2)	mg/kg	25	<25	<25	<25	<25	<25
TRH >C10-C16 (F2) - Naphthalene	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	mg/kg	210	<210	<210	<210	<210	<210

PARAMETER	UOM	LOR	BH105_0.0-0.1 SOIL - 10/12/2015 SE147094.007	BH106M_0.6-0.7 SOIL - 10/12/2015 SE147094.009	BH106M_0.9-1.0 SOIL - 10/12/2015 SE147094.010	BH107_0.2-0.3 SOIL - 10/12/2015 SE147094.011	BH108_0.2-0.3 SOIL - 10/12/2015 SE147094.012
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 (F2)	mg/kg	25	<25	<25	<25	<25	<25
TRH >C10-C16 (F2) - Naphthalene	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	mg/kg	210	<210	<210	<210	<210	<210

PARAMETER	UOM	LOR	BH109_0.2-0.3 SOIL - 10/12/2015 SE147094.013	BH109_0.7-0.8 SOIL - 10/12/2015 SE147094.014	BH110_0.3-0.4 SOIL - 10/12/2015 SE147094.015	BH111_0.2-0.3 SOIL - 10/12/2015 SE147094.016	BH111_1.1-1.2 SOIL - 10/12/2015 SE147094.017
TRH C10-C14	mg/kg	20	<20	<20	<20	<20	**52**
TRH C15-C28	mg/kg	45	<45	<45	<45	<45	**72**
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 (F2)	mg/kg	25	<25	<25	<25	<25	**82**
TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	<25	<25	<25	<25	**82**
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	**120**
TRH C10-C40 Total	mg/kg	210	<210	<210	<210	<210	<210

TRH (Total Recoverable Hydrocarbons) in Soil [AN403] Tested: 14/12/2015 (continued)

PARAMETER	UOM	LOR	BH112_0.2-0.3 SOIL - 10/12/2015 SE147094.018	BH113_0.2-0.3 SOIL - 10/12/2015 SE147094.019	BH114_0.2-0.3 SOIL - 10/12/2015 SE147094.020	BH114_1.0-1.1 SOIL - 10/12/2015 SE147094.021	BH115_0.2-0.3 SOIL - 10/12/2015 SE147094.022
TRH C10-C14	mg/kg	20	<20	<20	<20	**320**	<20
TRH C15-C28	mg/kg	45	<45	<45	<45	**460**	<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 (F2)	mg/kg	25	<25	<25	<25	**520**	<25
TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	<25	<25	<25	**510**	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90	**270**	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	<110	**780**	<110
TRH C10-C40 Total	mg/kg	210	<210	<210	<210	**780**	<210

PARAMETER	UOM	LOR	BH115_0.5-0.6 SOIL - 10/12/2015 SE147094.023	BH116_0.2-0.3 SOIL - 10/12/2015 SE147094.024	BH117_0.0-0.1 SOIL - 10/12/2015 SE147094.025	BH117M_1.0-1.1 SOIL - 10/12/2015 SE147094.026	BH118_0.4-0.8 SOIL - 10/12/2015 SE147094.028
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 (F2)	mg/kg	25	<25	<25	<25	<25	<25
TRH >C10-C16 (F2) - Naphthalene	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	mg/kg	210	<210	<210	<210	<210	<210

PARAMETER	UOM	LOR	BH119_0.0-0.1 SOIL - 10/12/2015 SE147094.029	QD-01 SOIL - 10/12/2015 SE147094.030	SP1-1 SOIL - 10/12/2015 SE147094.033	SP1-2 SOIL - 10/12/2015 SE147094.034
TRH C10-C14	mg/kg	20	<20	<20	**73**	<20
TRH C15-C28	mg/kg	45	<45	<45	**140**	<45
TRH C29-C36	mg/kg	45	<45	<45	**230**	**68**
TRH C37-C40	mg/kg	100	<100	<100	<100	<100
TRH >C10-C16 (F2)	mg/kg	25	<25	<25	**84**	<25
TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	<25	<25	**84**	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	**290**	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	**440**	<110
TRH C10-C40 Total	mg/kg	210	<210	<210	**440**	<210

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420] Tested: 14/12/2015

PARAMETER	UOM	LOR	BH101_0.0-0.1 SOIL - 10/12/2015 SE147094.001	BH101_0.4-0.5 SOIL - 10/12/2015 SE147094.002	BH102_0.0-0.1 SOIL - 10/12/2015 SE147094.003	BH103_0.0-0.1 SOIL - 10/12/2015 SE147094.004	BH104M_0.4-0.5 SOIL - 10/12/2015 SE147094.006
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	<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	<0.1
Chrysene	mg/kg	0.1	<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	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<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	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0*	TEQ	0.2	<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	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2*	TEQ (mg/kg)	0.2	<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	<0.8

PARAMETER	UOM	LOR	BH105_0.0-0.1 SOIL - 10/12/2015 SE147094.007	BH106M_0.6-0.7 SOIL - 10/12/2015 SE147094.009	BH106M_0.9-1.0 SOIL - 10/12/2015 SE147094.010	BH107_0.2-0.3 SOIL - 10/12/2015 SE147094.011	BH108_0.2-0.3 SOIL - 10/12/2015 SE147094.012
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	<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	<0.1
Chrysene	mg/kg	0.1	<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	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<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	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0*	TEQ	0.2	<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	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2*	TEQ (mg/kg)	0.2	<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	<0.8

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420] Tested: 14/12/2015 (continued)

PARAMETER	UOM	LOR	BH109_0.2-0.3 SOIL - 10/12/2015 SE147094.013	BH109_0.7-0.8 SOIL - 10/12/2015 SE147094.014	BH110_0.3-0.4 SOIL - 10/12/2015 SE147094.015	BH111_0.2-0.3 SOIL - 10/12/2015 SE147094.016	BH111_1.1-1.2 SOIL - 10/12/2015 SE147094.017
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	**0.1**
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	<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	<0.1
Chrysene	mg/kg	0.1	<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	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<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	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0*	TEQ	0.2	<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	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2*	TEQ (mg/kg)	0.2	<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	<0.8

PARAMETER	UOM	LOR	BH112_0.2-0.3 SOIL - 10/12/2015 SE147094.018	BH113_0.2-0.3 SOIL - 10/12/2015 SE147094.019	BH114_0.2-0.3 SOIL - 10/12/2015 SE147094.020	BH114_1.0-1.1 SOIL - 10/12/2015 SE147094.021	BH115_0.2-0.3 SOIL - 10/12/2015 SE147094.022
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	**1.8**	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	**0.4**	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	**0.2**	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	**0.3**	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	**0.6**	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1	<0.1	**1.0**	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	<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	<0.1
Chrysene	mg/kg	0.1	<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	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<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	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0*	TEQ	0.2	<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	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2*	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total PAH (18)	mg/kg	0.8	<0.8	<0.8	<0.8	**4.4**	<0.8

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420] Tested: 14/12/2015 (continued)

PARAMETER	UOM	LOR	BH115_0.5-0.6 SOIL - 10/12/2015 SE147094.023	BH116_0.2-0.3 SOIL - 10/12/2015 SE147094.024	BH117_0.0-0.1 SOIL - 10/12/2015 SE147094.025	BH117M_1.0-1.1 SOIL - 10/12/2015 SE147094.026	BH118_0.4-0.8 SOIL - 10/12/2015 SE147094.028
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	<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	<0.1
Chrysene	mg/kg	0.1	<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	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<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	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0*	TEQ	0.2	<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	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2*	TEQ (mg/kg)	0.2	<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	<0.8

PARAMETER	UOM	LOR	BH119_0.0-0.1 SOIL - 10/12/2015 SE147094.029	SP1-1 SOIL - 10/12/2015 SE147094.033	SP1-2 SOIL - 10/12/2015 SE147094.034
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.1	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1
Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0*	TEQ	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
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2*	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2
Total PAH (18)	mg/kg	0.8	<0.8	<0.8	<0.8

OC Pesticides in Soil [AN400/AN420] Tested: 14/12/2015

PARAMETER	UOM	LOR	BH101_0.0-0.1 SOIL - 10/12/2015 SE147094.001	BH102_0.0-0.1 SOIL - 10/12/2015 SE147094.003	BH103_0.0-0.1 SOIL - 10/12/2015 SE147094.004	BH104M_0.4-0.5 SOIL - 10/12/2015 SE147094.006	BH105_0.0-0.1 SOIL - 10/12/2015 SE147094.007
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

OC Pesticides in Soil [AN400/AN420] Tested: 14/12/2015 (continued)

PARAMETER	UOM	LOR	BH106M_0.6-0.7 SOIL - 10/12/2015 SE147094.009	BH107_0.2-0.3 SOIL - 10/12/2015 SE147094.011	BH108_0.2-0.3 SOIL - 10/12/2015 SE147094.012	BH109_0.2-0.3 SOIL - 10/12/2015 SE147094.013	BH110_0.3-0.4 SOIL - 10/12/2015 SE147094.015
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

OC Pesticides in Soil [AN400/AN420] Tested: 14/12/2015 (continued)

PARAMETER	UOM	LOR	BH111_0.2-0.3 SOIL - 10/12/2015 SE147094.016	BH112_0.2-0.3 SOIL - 10/12/2015 SE147094.018	BH113_0.2-0.3 SOIL - 10/12/2015 SE147094.019	BH114_0.2-0.3 SOIL - 10/12/2015 SE147094.020	BH115_0.2-0.3 SOIL - 10/12/2015 SE147094.022
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

OC Pesticides in Soil [AN400/AN420] Tested: 14/12/2015 (continued)

PARAMETER	UOM	LOR	BH116_0.2-0.3 SOIL - 10/12/2015 SE147094.024	BH117_0.0-0.1 SOIL - 10/12/2015 SE147094.025	BH118_0.4-0.8 SOIL - 10/12/2015 SE147094.028	BH119_0.0-0.1 SOIL - 10/12/2015 SE147094.029	SP1-1 SOIL - 10/12/2015 SE147094.033
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	**0.2**	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	**0.2**	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	<0.1	**0.1**	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

OC Pesticides in Soil [AN400/AN420] Tested: 14/12/2015 (continued)

PARAMETER	UOM	LOR	SP1-2 SOIL - 10/12/2015 SE147094.034
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1
Lindane	mg/kg	0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1
Aldrin	mg/kg	0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2
Endrin	mg/kg	0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1
Isodrin	mg/kg	0.1	<0.1
Mirex	mg/kg	0.1	<0.1

OP Pesticides in Soil [AN400/AN420] Tested: 14/12/2015

PARAMETER	UOM	LOR	BH101_0.0-0.1 SOIL - 10/12/2015 SE147094.001	BH102_0.0-0.1 SOIL - 10/12/2015 SE147094.003	BH103_0.0-0.1 SOIL - 10/12/2015 SE147094.004	BH104M_0.4-0.5 SOIL - 10/12/2015 SE147094.006	BH105_0.0-0.1 SOIL - 10/12/2015 SE147094.007
Dichlorvos	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2

PARAMETER	UOM	LOR	BH106M_0.6-0.7 SOIL - 10/12/2015 SE147094.009	BH107_0.2-0.3 SOIL - 10/12/2015 SE147094.011	BH108_0.2-0.3 SOIL - 10/12/2015 SE147094.012	BH109_0.2-0.3 SOIL - 10/12/2015 SE147094.013	BH110_0.3-0.4 SOIL - 10/12/2015 SE147094.015
Dichlorvos	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2

PARAMETER	UOM	LOR	BH111_0.2-0.3 SOIL - 10/12/2015 SE147094.016	BH112_0.2-0.3 SOIL - 10/12/2015 SE147094.018	BH113_0.2-0.3 SOIL - 10/12/2015 SE147094.019	BH114_0.2-0.3 SOIL - 10/12/2015 SE147094.020	BH115_0.2-0.3 SOIL - 10/12/2015 SE147094.022
Dichlorvos	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2

OP Pesticides in Soil [AN400/AN420] Tested: 14/12/2015 (continued)

PARAMETER	UOM	LOR	BH116_0.2-0.3 SOIL - 10/12/2015 SE147094.024	BH117_0.0-0.1 SOIL - 10/12/2015 SE147094.025	BH118_0.4-0.8 SOIL - 10/12/2015 SE147094.028	BH119_0.0-0.1 SOIL - 10/12/2015 SE147094.029	SP1-1 SOIL - 10/12/2015 SE147094.033
Dichlorvos	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2

PARAMETER	UOM	LOR	SP1-2 SOIL - 10/12/2015 SE147094.034
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

PCBs in Soil [AN400/AN420] Tested: 14/12/2015

PARAMETER	UOM	LOR	BH101_0.0-0.1 SOIL - 10/12/2015 SE147094.001	BH102_0.0-0.1 SOIL - 10/12/2015 SE147094.003	BH103_0.0-0.1 SOIL - 10/12/2015 SE147094.004	BH104M_0.4-0.5 SOIL - 10/12/2015 SE147094.006	BH105_0.0-0.1 SOIL - 10/12/2015 SE147094.007
Arochlor 1016	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1	<1	<1	<1	<1

PARAMETER	UOM	LOR	BH106M_0.6-0.7 SOIL - 10/12/2015 SE147094.009	BH107_0.2-0.3 SOIL - 10/12/2015 SE147094.011	BH108_0.2-0.3 SOIL - 10/12/2015 SE147094.012	BH109_0.2-0.3 SOIL - 10/12/2015 SE147094.013	BH110_0.3-0.4 SOIL - 10/12/2015 SE147094.015
Arochlor 1016	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1	<1	<1	<1	<1

PARAMETER	UOM	LOR	BH111_0.2-0.3 SOIL - 10/12/2015 SE147094.016	BH112_0.2-0.3 SOIL - 10/12/2015 SE147094.018	BH113_0.2-0.3 SOIL - 10/12/2015 SE147094.019	BH114_0.2-0.3 SOIL - 10/12/2015 SE147094.020	BH115_0.2-0.3 SOIL - 10/12/2015 SE147094.022
Arochlor 1016	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1	<1	<1	<1	<1

PCBs in Soil [AN400/AN420] Tested: 14/12/2015 (continued)

PARAMETER	UOM	LOR	BH116_0.2-0.3 SOIL - 10/12/2015 SE147094.024	BH117_0.0-0.1 SOIL - 10/12/2015 SE147094.025	BH118_0.4-0.8 SOIL - 10/12/2015 SE147094.028	BH119_0.0-0.1 SOIL - 10/12/2015 SE147094.029	SP1-1 SOIL - 10/12/2015 SE147094.033
Arochlor 1016	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1	<1	<1	<1	<1

PARAMETER	UOM	LOR	SP1-2 SOIL - 10/12/2015 SE147094.034
Arochlor 1016	mg/kg	0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1

Total Recoverable Metals in Soil by ICPOES [AN040/AN320] Tested: 15/12/2015

PARAMETER	UOM	LOR	BH101_0.0-0.1 SOIL - 10/12/2015 SE147094.001	BH101_0.4-0.5 SOIL - 10/12/2015 SE147094.002	BH102_0.0-0.1 SOIL - 10/12/2015 SE147094.003	BH103_0.0-0.1 SOIL - 10/12/2015 SE147094.004	BH104M_0.4-0.5 SOIL - 10/12/2015 SE147094.006
Arsenic, As	mg/kg	3	6	6	7	8	7
Cadmium, Cd	mg/kg	0.3	0.4	0.4	0.5	0.4	0.3
Chromium, Cr	mg/kg	0.3	14	12	18	12	12
Copper, Cu	mg/kg	0.5	11	16	16	16	11
Lead, Pb	mg/kg	1	18	15	20	27	16
Nickel, Ni	mg/kg	0.5	7.5	4.2	7.5	9.2	8.0
Zinc, Zn	mg/kg	0.5	35	35	45	99	28

PARAMETER	UOM	LOR	BH105_0.0-0.1 SOIL - 10/12/2015 SE147094.007	BH106M_0.6-0.7 SOIL - 10/12/2015 SE147094.009	BH106M_0.9-1.0 SOIL - 10/12/2015 SE147094.010	BH107_0.2-0.3 SOIL - 10/12/2015 SE147094.011	BH108_0.2-0.3 SOIL - 10/12/2015 SE147094.012
Arsenic, As	mg/kg	3	7	7	5	3	6
Cadmium, Cd	mg/kg	0.3	0.5	0.3	<0.3	0.6	1.4
Chromium, Cr	mg/kg	0.3	9.8	12	78	17	26
Copper, Cu	mg/kg	0.5	22	15	15	49	61
Lead, Pb	mg/kg	1	150	20	12	22	52
Nickel, Ni	mg/kg	0.5	8.7	9.7	25	25	28
Zinc, Zn	mg/kg	0.5	480	43	23	83	220

PARAMETER	UOM	LOR	BH109_0.2-0.3 SOIL - 10/12/2015 SE147094.013	BH109_0.7-0.8 SOIL - 10/12/2015 SE147094.014	BH110_0.3-0.4 SOIL - 10/12/2015 SE147094.015	BH111_0.2-0.3 SOIL - 10/12/2015 SE147094.016	BH111_1.1-1.2 SOIL - 10/12/2015 SE147094.017
Arsenic, As	mg/kg	3	10	9	11	7	12
Cadmium, Cd	mg/kg	0.3	0.3	0.4	0.4	0.4	0.5
Chromium, Cr	mg/kg	0.3	15	14	16	12	20
Copper, Cu	mg/kg	0.5	11	13	23	13	16
Lead, Pb	mg/kg	1	19	17	29	22	19
Nickel, Ni	mg/kg	0.5	5.0	2.3	7.2	6.0	5.0
Zinc, Zn	mg/kg	0.5	19	16	48	55	32

PARAMETER	UOM	LOR	BH112_0.2-0.3 SOIL - 10/12/2015 SE147094.018	BH113_0.2-0.3 SOIL - 10/12/2015 SE147094.019	BH114_0.2-0.3 SOIL - 10/12/2015 SE147094.020	BH114_1.0-1.1 SOIL - 10/12/2015 SE147094.021	BH115_0.2-0.3 SOIL - 10/12/2015 SE147094.022
Arsenic, As	mg/kg	3	8	12	5	10	7
Cadmium, Cd	mg/kg	0.3	0.5	0.5	0.5	0.3	0.3
Chromium, Cr	mg/kg	0.3	19	17	27	9.0	9.2
Copper, Cu	mg/kg	0.5	21	12	27	12	15
Lead, Pb	mg/kg	1	21	20	16	12	16
Nickel, Ni	mg/kg	0.5	20	6.7	30	1.2	3.1
Zinc, Zn	mg/kg	0.5	52	26	54	12	14

Total Recoverable Metals in Soil by ICPOES [AN040/AN320] Tested: 15/12/2015 (continued)

PARAMETER	UOM	LOR	BH115_0.5-0.6 SOIL - 10/12/2015 SE147094.023	BH116_0.2-0.3 SOIL - 10/12/2015 SE147094.024	BH117_0.0-0.1 SOIL - 10/12/2015 SE147094.025	BH117M_1.0-1.1 SOIL - 10/12/2015 SE147094.026	BH118_0.4-0.8 SOIL - 10/12/2015 SE147094.028
Arsenic, As	mg/kg	3	7	5	3	8	11
Cadmium, Cd	mg/kg	0.3	0.4	0.6	0.7	0.6	0.6
Chromium, Cr	mg/kg	0.3	12	53	66	15	15
Copper, Cu	mg/kg	0.5	9.3	31	40	9.3	22
Lead, Pb	mg/kg	1	15	18	37	20	72
Nickel, Ni	mg/kg	0.5	1.1	26	50	5.8	11
Zinc, Zn	mg/kg	0.5	8.8	71	88	28	200

PARAMETER	UOM	LOR	BH119_0.0-0.1 SOIL - 10/12/2015 SE147094.029	QD-01 SOIL - 10/12/2015 SE147094.030	SP1-1 SOIL - 10/12/2015 SE147094.033	SP1-2 SOIL - 10/12/2015 SE147094.034
Arsenic, As	mg/kg	3	6	8	10	6
Cadmium, Cd	mg/kg	0.3	0.6	0.6	0.8	0.5
Chromium, Cr	mg/kg	0.3	20	16	19	17
Copper, Cu	mg/kg	0.5	28	13	21	30
Lead, Pb	mg/kg	1	57	22	29	27
Nickel, Ni	mg/kg	0.5	25	7.1	18	30
Zinc, Zn	mg/kg	0.5	110	39	100	95

Mercury in Soil [AN312] Tested: 16/12/2015

PARAMETER	UOM	LOR	BH101_0.0-0.1 SOIL - 10/12/2015 SE147094.001	BH101_0.4-0.5 SOIL - 10/12/2015 SE147094.002	BH102_0.0-0.1 SOIL - 10/12/2015 SE147094.003	BH103_0.0-0.1 SOIL - 10/12/2015 SE147094.004	BH104M_0.4-0.5 SOIL - 10/12/2015 SE147094.006
Mercury	mg/kg	0.01	0.04	<0.01	0.02	0.05	0.01

PARAMETER	UOM	LOR	BH105_0.0-0.1 SOIL - 10/12/2015 SE147094.007	BH106M_0.6-0.7 SOIL - 10/12/2015 SE147094.009	BH106M_0.9-1.0 SOIL - 10/12/2015 SE147094.010	BH107_0.2-0.3 SOIL - 10/12/2015 SE147094.011	BH108_0.2-0.3 SOIL - 10/12/2015 SE147094.012
Mercury	mg/kg	0.01	0.02	0.03	<0.01	0.02	0.02

PARAMETER	UOM	LOR	BH109_0.2-0.3 SOIL - 10/12/2015 SE147094.013	BH109_0.7-0.8 SOIL - 10/12/2015 SE147094.014	BH110_0.3-0.4 SOIL - 10/12/2015 SE147094.015	BH111_0.2-0.3 SOIL - 10/12/2015 SE147094.016	BH111_1.1-1.2 SOIL - 10/12/2015 SE147094.017
Mercury	mg/kg	0.01	0.01	0.02	0.02	<0.01	0.02

PARAMETER	UOM	LOR	BH112_0.2-0.3 SOIL - 10/12/2015 SE147094.018	BH113_0.2-0.3 SOIL - 10/12/2015 SE147094.019	BH114_0.2-0.3 SOIL - 10/12/2015 SE147094.020	BH114_1.0-1.1 SOIL - 10/12/2015 SE147094.021	BH115_0.2-0.3 SOIL - 10/12/2015 SE147094.022
Mercury	mg/kg	0.01	<0.01	0.02	0.01	0.01	0.01

PARAMETER	UOM	LOR	BH115_0.5-0.6 SOIL - 10/12/2015 SE147094.023	BH116_0.2-0.3 SOIL - 10/12/2015 SE147094.024	BH117_0.0-0.1 SOIL - 10/12/2015 SE147094.025	BH117M_1.0-1.1 SOIL - 10/12/2015 SE147094.026	BH118_0.4-0.8 SOIL - 10/12/2015 SE147094.028
Mercury	mg/kg	0.01	<0.01	<0.01	0.01	0.02	0.03

PARAMETER	UOM	LOR	BH119_0.0-0.1 SOIL - 10/12/2015 SE147094.029	QD-01 SOIL - 10/12/2015 SE147094.030	SP1-1 SOIL - 10/12/2015 SE147094.033	SP1-2 SOIL - 10/12/2015 SE147094.034
Mercury	mg/kg	0.01	0.02	0.02	0.02	0.01

Moisture Content [AN002] Tested: 14/12/2015

PARAMETER	UOM	LOR	BH101_0.0-0.1 SOIL - 10/12/2015 SE147094.001	BH101_0.4-0.5 SOIL - 10/12/2015 SE147094.002	BH102_0.0-0.1 SOIL - 10/12/2015 SE147094.003	BH103_0.0-0.1 SOIL - 10/12/2015 SE147094.004	BH104M_0.4-0.5 SOIL - 10/12/2015 SE147094.006
% Moisture	%w/w	0.5	11	18	15	16	15

PARAMETER	UOM	LOR	BH105_0.0-0.1 SOIL - 10/12/2015 SE147094.007	BH106M_0.6-0.7 SOIL - 10/12/2015 SE147094.009	BH106M_0.9-1.0 SOIL - 10/12/2015 SE147094.010	BH107_0.2-0.3 SOIL - 10/12/2015 SE147094.011	BH108_0.2-0.3 SOIL - 10/12/2015 SE147094.012
% Moisture	%w/w	0.5	18	22	20	17	16

PARAMETER	UOM	LOR	BH109_0.2-0.3 SOIL - 10/12/2015 SE147094.013	BH109_0.7-0.8 SOIL - 10/12/2015 SE147094.014	BH110_0.3-0.4 SOIL - 10/12/2015 SE147094.015	BH111_0.2-0.3 SOIL - 10/12/2015 SE147094.016	BH111_1.1-1.2 SOIL - 10/12/2015 SE147094.017
% Moisture	%w/w	0.5	19	24	17	11	25

PARAMETER	UOM	LOR	BH112_0.2-0.3 SOIL - 10/12/2015 SE147094.018	BH113_0.2-0.3 SOIL - 10/12/2015 SE147094.019	BH114_0.2-0.3 SOIL - 10/12/2015 SE147094.020	BH114_1.0-1.1 SOIL - 10/12/2015 SE147094.021	BH115_0.2-0.3 SOIL - 10/12/2015 SE147094.022
% Moisture	%w/w	0.5	18	21	18	21	21

PARAMETER	UOM	LOR	BH115_0.5-0.6 SOIL - 10/12/2015 SE147094.023	BH116_0.2-0.3 SOIL - 10/12/2015 SE147094.024	BH117_0.0-0.1 SOIL - 10/12/2015 SE147094.025	BH117M_1.0-1.1 SOIL - 10/12/2015 SE147094.026	BH118_0.4-0.8 SOIL - 10/12/2015 SE147094.028
% Moisture	%w/w	0.5	23	16	7.4	16	15

PARAMETER	UOM	LOR	BH119_0.0-0.1 SOIL - 10/12/2015 SE147094.029	QD-01 SOIL - 10/12/2015 SE147094.030	Trip Blank SOIL - 10/12/2015 SE147094.032	SP1-1 SOIL - 10/12/2015 SE147094.033	SP1-2 SOIL - 10/12/2015 SE147094.034
% Moisture	%w/w	0.5	9.5	15	<0.5	8.7	3.8

Fibre Identification in soil [AN602] Tested: 17/12/2015

PARAMETER	UOM	LOR	BH101_0.0-0.1 SOIL - 10/12/2015 SE147094.001	BH102_0.0-0.1 SOIL - 10/12/2015 SE147094.003	BH103_0.0-0.1 SOIL - 10/12/2015 SE147094.004	BH104M_0.0-0.1 SOIL - 10/12/2015 SE147094.005	BH105_0.0-0.1 SOIL - 10/12/2015 SE147094.007
Asbestos Detected	No unit	-	No	No	No	No	No
Estimated Fibres*	%w/w	0.01	<0.01	<0.01	<0.01	<0.01	<0.01

PARAMETER	UOM	LOR	BH106M_0.2-0.3 SOIL - 10/12/2015 SE147094.008	BH107_0.2-0.3 SOIL - 10/12/2015 SE147094.011	BH108_0.2-0.3 SOIL - 10/12/2015 SE147094.012	BH109_0.2-0.3 SOIL - 10/12/2015 SE147094.013	BH110_0.3-0.4 SOIL - 10/12/2015 SE147094.015
Asbestos Detected	No unit	-	No	No	No	No	No
Estimated Fibres*	%w/w	0.01	<0.01	<0.01	<0.01	<0.01	<0.01

PARAMETER	UOM	LOR	BH111_0.2-0.3 SOIL - 10/12/2015 SE147094.016	BH112_0.2-0.3 SOIL - 10/12/2015 SE147094.018	BH113_0.2-0.3 SOIL - 10/12/2015 SE147094.019	BH114_0.2-0.3 SOIL - 10/12/2015 SE147094.020	BH115_0.2-0.3 SOIL - 10/12/2015 SE147094.022
Asbestos Detected	No unit	-	No	No	No	No	No
Estimated Fibres*	%w/w	0.01	<0.01	<0.01	<0.01	<0.01	<0.01

PARAMETER	UOM	LOR	BH116_0.2-0.3 SOIL - 10/12/2015 SE147094.024	BH117_0.0-0.1 SOIL - 10/12/2015 SE147094.025	BH118_0.0-0.1 SOIL - 10/12/2015 SE147094.027	BH119_0.0-0.1 SOIL - 10/12/2015 SE147094.029	SP1-1 SOIL - 10/12/2015 SE147094.033
Asbestos Detected	No unit	-	No	Yes	Yes	No	No
Estimated Fibres*	%w/w	0.01	<0.01	<0.01	**>0.01**	<0.01	<0.01

PARAMETER	UOM	LOR	SP1-2 SOIL - 10/12/2015 SE147094.034
Asbestos Detected	No unit	-	No
Estimated Fibres*	%w/w	0.01	<0.01

VOCs in Water [AN433/AN434] Tested: 16/12/2015

PARAMETER	UOM	LOR	QR-01 WATER - 10/12/2015 SE147094.031
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/AN434/AN410] Tested: 16/12/2015

PARAMETER	UOM	LOR	QR-01 WATER - 10/12/2015 SE147094.031
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: 14/12/2015

PARAMETER	UOM	LOR	QR-01 WATER - 10/12/2015 SE147094.031
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 (F2)	µg/L	60	<60
TRH >C16-C34 (F3)	µg/L	500	<500
TRH >C34-C40 (F4)	µg/L	500	<500
TRH C10-C36	µg/L	450	<450
TRH C10-C40	µg/L	650	<650

Trace Metals (Dissolved) in Water by ICPMS [AN318] Tested: 14/12/2015

PARAMETER	UOM	LOR	QR-01 WATER - 10/12/2015 SE147094.031
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/AN312] Tested: 17/12/2015

PARAMETER	UOM	LOR	QR-01 WATER - 10/12/2015 SE147094.031
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/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, in accordance with USEPA 6020A.
AN400	OC and OP Pesticides by GC-ECD: The determination of organochlorine (OC) and organophosphorus (OP) pesticides and polychlorinated biphenyls (PCBs) in soils, sludges and groundwater. (Based on USEPA methods 3510, 3550, 8140 and 8080.)
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 Petroleum Hydrocarbons (TPH) 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/AN434/AN410	VOCs and C6-C9/C6-C10 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.
AN433/AN434	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.
AN602	Qualitative identification of chrysotile, amosite and crocidolite in bulk samples by polarised light microscopy (PLM) in conjunction with dispersion staining (DS). AS4964 provides the basis for this document. Unequivocal identification of the asbestos minerals present is made by obtaining sufficient diagnostic `clues`, which provide a reasonable degree of certainty, dispersion staining is a mandatory `clue` for positive identification. If sufficient `clues` are absent, then positive identification of asbestos is not possible. This procedure requires removal of suspect fibres/bundles from the sample which cannot be returned.
AN602	Fibres/material that cannot be unequivocably identified as one of the three asbestos forms, will be reported as unknown mineral fibres (umf).

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 limit 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 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.
		NVL	Not validated.	LOR	Limit of Reporting.
**	Indicative data, theoretical holding time exceeded.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		

Samples 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 calcuated 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.

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here : http://www.sgs.com.au/~/media/Local/Australia/Documents/ Technical%20Documents/MP-AU-ENV-QU-022%20QA%20QC%20Plan.pdf

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

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Project	**E22817 37-39 Pavesi St, Guildford West**
Order Number	**E22817**
Samples	21

LABORATORY DETAILS

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SGS Reference	**SE147094 R0**
Date Received	11 Dec 2015
Date Reported	18 Dec 2015

COMMENTS

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

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

Sample #5: A portion of the sample supplied has been sub-sampled for asbestos according to SGS In-house procedures.
We therefore cannot guarantee that the sub-sample is representative of the entire sample supplied.
SGS Environmental Services recommends supplying approximately 50-100g of sample in a separate container.

Sample #25: 2-4mm length fibre bundles x4 found loose in sample.
Sample #27: 2-8mm length fibre bundles found in 30x20x4mm cement sheet fragment.

Asbestos analysed by Approved Identifier Yusuf Kuthpudin.

SIGNATORIES

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Metals/Inorganics Team Leader

Kamrul Ahsan
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ANALYTICAL REPORT

RESULTS

Fibre Identification in soil — Method AN602

Laboratory Reference	Client Reference	Matrix	Sample Description	Date Sampled	Fibre Identification	
SE147094.001	BH101_0.0-0.1	Soil	114g Clay, Soil, Rocks	10 Dec 2015	No Asbestos Found	<0.01
SE147094.003	BH102_0.0-0.1	Soil	220g Clay, Rocks	10 Dec 2015	No Asbestos Found	<0.01
SE147094.004	BH103_0.0-0.1	Soil	145g Clay, Soil, Rocks	10 Dec 2015	No Asbestos Found	<0.01
SE147094.005	BH104M_0.0-0.1	Soil	100g Clay, Soil, Rocks	10 Dec 2015	No Asbestos Found	<0.01
SE147094.007	BH105_0.0-0.1	Soil	127g Clay, Soil, Rocks	10 Dec 2015	No Asbestos Found	<0.01
SE147094.008	BH106M_0.2-0.3	Soil	110g Clay, Soil, Rocks	10 Dec 2015	No Asbestos Found	<0.01
SE147094.011	BH107_0.2-0.3	Soil	191g Clay, Soil, Rocks	10 Dec 2015	No Asbestos Found	<0.01
SE147094.012	BH108_0.2-0.3	Soil	133g Clay, Soil, Rocks	10 Dec 2015	No Asbestos Found	<0.01
SE147094.013	BH109_0.2-0.3	Soil	208g Clay, Rocks	10 Dec 2015	No Asbestos Found	<0.01
SE147094.015	BH110_0.3-0.4	Soil	187g Clay, Soil, Rocks	10 Dec 2015	No Asbestos Found	<0.01
SE147094.016	BH111_0.2-0.3	Soil	144g Clay, Sand, Soil, Rocks	10 Dec 2015	No Asbestos Found	<0.01
SE147094.018	BH112_0.2-0.3	Soil	175g Clay, Soil, Rocks	10 Dec 2015	No Asbestos Found	<0.01
SE147094.019	BH113_0.2-0.3	Soil	128g Clay, Soil, Rocks	10 Dec 2015	No Asbestos Found	<0.01
SE147094.020	BH114_0.2-0.3	Soil	215g Clay, Soil, Rocks	10 Dec 2015	No Asbestos Found	<0.01
SE147094.022	BH115_0.2-0.3	Soil	149g Clay, Sand, Soil, Rocks	10 Dec 2015	No Asbestos Found	<0.01
SE147094.024	BH116_0.2-0.3	Soil	127g Clay, Soil, Rocks	10 Dec 2015	No Asbestos Found	<0.01
SE147094.025	BH117_0.0-0.1	Soil	136g Clay, Soil, Rocks	10 Dec 2015	Chrysotile Asbestos Found	<0.01
SE147094.027	BH118_0.0-0.1	Soil	154g Clay, Soil, Rocks	10 Dec 2015	Chrysotile Asbestos Found	>0.01
SE147094.029	BH119_0.0-0.1	Soil	122g Clay, Soil, Rock	10 Dec 2015	No Asbestos Found	<0.01
SE147094.033	SP1-1	Soil	158g Clay, Soil, Rocks	10 Dec 2015	No Asbestos Found Organic Fibres Detected	<0.01
SE147094.034	SP1-2	Soil	170g Clay, Soil, Rocks	10 Dec 2015	No Asbestos Found Organic Fibres Detected	<0.01

METHOD SUMMARY

SE147094 R0

METHOD	METHODOLOGY SUMMARY
AN602	Qualitative identification of chrysotile, amosite and crocidolite in bulk samples by polarised light microscopy (PLM) in conjunction with dispersion staining (DS). AS4964 provides the basis for this document. Unequivocal identification of the asbestos minerals present is made by obtaining sufficient diagnostic `clues`, which provide a reasonable degree of certainty, dispersion staining is a mandatory `clue` for positive identification. If sufficient `clues` are absent, then positive identification of asbestos is not possible. This procedure requires removal of suspect fibres/bundles from the sample which cannot be returned.
AN602	Fibres/material that cannot be unequivocably identified as one of the three asbestos forms, will be reported as unknown mineral fibres (umf).
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 limit 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 of 0.1 g/kg” (<0.01%w/w) where AN602 section 4.5 of this method has been followed, and if- (a) no trace asbestos fibres have been detected (i.e. no ‘respirable’ fibres): (b) the estimated weight of non-respirable asbestos fibre bundles and/or the estimated weight of asbestos in asbestos-containing materials are found to be less than 0.1g/kg: and (c) these non-respirable asbestos fibre bundles and/or the asbestos containing materials are only visible under stereo-microscope viewing conditions.

FOOTNOTES

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

(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.

Sampled by the client.

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 criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here : http://www.sgs.com.au/~/media/Local/Australia/Documents/ Technical%20Documents/MP-AU-ENV-QU-022%20QA%20QC%20Plan.pdf

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

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Project	**E22817 37-39 Pavesi St Guildford - Add**
Order Number	**E22817**
Samples	36

LABORATORY DETAILS

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SGS Reference	**SE147094A R0**
Date Received	21/12/2015
Date Reported	30/12/2015

COMMENTS

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

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

Sample #26, 36: A portion of the sample supplied has been sub-sampled for asbestos according to SGS In-house procedures.
We therefore cannot guarantee that the sub-sample is representative of the entire sample supplied.
SGS Environmental Services recommends supplying approximately 50-100g of sample in a separate container.

Asbestos analysed by Approved Identifier Yusuf Kuthpudin.

SIGNATORIES

Andy Sutton
Senior Organic Chemist

Ly Kim Ha
Organic Section Head

Yusuf Kuthpudin
Asbestos Analyst

Volatile Petroleum Hydrocarbons in Soil [AN433/AN434/AN410] Tested: 21/12/2015

PARAMETER	UOM	LOR	BH114_1.6-1.7 SOIL - 10/12/2015 SE147094A.035
TRH C6-C9	mg/kg	20	<20
Benzene (F0)	mg/kg	0.1	<0.1
TRH C6-C10	mg/kg	25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25

TRH (Total Recoverable Hydrocarbons) in Soil [AN403] Tested: 21/12/2015

PARAMETER	UOM	LOR	BH114_1.6-1.7 SOIL - 10/12/2015 SE147094A.035
TRH C10-C14	mg/kg	20	**63**
TRH C15-C28	mg/kg	45	**100**
TRH C29-C36	mg/kg	45	<45
TRH C37-C40	mg/kg	100	<100
TRH >C10-C16 (F2)	mg/kg	25	**98**
TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	**98**
TRH >C16-C34 (F3)	mg/kg	90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120
TRH C10-C36 Total	mg/kg	110	**170**
TRH C10-C40 Total	mg/kg	210	<210

Fibre Identification in soil [AN602] Tested: 29/12/2015

PARAMETER	UOM	LOR	BH117M_1.0-1.1 SOIL - 10/12/2015 SE147094A.026	BH118_1.0-1.1 SOIL - 10/12/2015 SE147094A.036
Asbestos Detected	No unit	-	No	No
Estimated Fibres*	%w/w	0.01	<0.01	<0.01

Moisture Content [AN002] Tested: 22/12/2015

PARAMETER	UOM	LOR	BH114_1.6-1.7 SOIL - 10/12/2015 SE147094A.035
% Moisture	%w/w	0.5	**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.
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 Petroleum Hydrocarbons (TPH) 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.
AN433/AN434/AN410	VOCs and C6-C9/C6-C10 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.
AN602	Qualitative identification of chrysotile, amosite and crocidolite in bulk samples by polarised light microscopy (PLM) in conjunction with dispersion staining (DS). AS4964 provides the basis for this document. Unequivocal identification of the asbestos minerals present is made by obtaining sufficient diagnostic `clues`, which provide a reasonable degree of certainty, dispersion staining is a mandatory `clue` for positive identification. If sufficient `clues` are absent, then positive identification of asbestos is not possible. This procedure requires removal of suspect fibres/bundles from the sample which cannot be returned.
AN602	Fibres/material that cannot be unequivocably identified as one of the three asbestos forms, will be reported as unknown mineral fibres (umf).
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 limit 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 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.
		NVL	Not validated.	LOR	Limit of Reporting.
**	Indicative data, theoretical holding time exceeded.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		

Samples 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 calcuated 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.

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here : http://www.sgs.com.au/~/media/Local/Australia/Documents/ Technical%20Documents/MP-AU-ENV-QU-022%20QA%20QC%20Plan.pdf

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Jessie Sixsmith
Client	Environmental Investigations
Address	Suite 6.01, 55 Miller Street NSW 2009
Telephone	02 9516 0722
Facsimile	02 9516 0741
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Project	**E22817 37-39 Pavesi St Guildford - Add**
Order Number	**E22817**
Samples	2

LABORATORY DETAILS

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Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
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SGS Reference	**SE147094A R0**
Date Received	21 Dec 2015
Date Reported	30 Dec 2015

COMMENTS

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

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

Sample #26, 36: A portion of the sample supplied has been sub-sampled for asbestos according to SGS In-house procedures.
We therefore cannot guarantee that the sub-sample is representative of the entire sample supplied.
SGS Environmental Services recommends supplying approximately 50-100g of sample in a separate container.

Asbestos analysed by Approved Identifier Yusuf Kuthpudin.

SIGNATORIES

Andy Sutton
Senior Organic Chemist

Ly Kim Ha
Organic Section Head

Yusuf Kuthpudin
Asbestos Analyst

ANALYTICAL REPORT

RESULTS

Fibre Identification in soil — Method AN602

Laboratory Reference	Client Reference	Matrix	Sample Description	Date Sampled	Fibre Identification	
SE147094A.026	BH117M_1.0-1.1	Soil	148g Clay, Rocks	10 Dec 2015	No Asbestos Found	<0.01
SE147094A.036	BH118_1.0-1.1	Soil	100g Clay, Soil, Rocks	10 Dec 2015	No Asbestos Found	<0.01

METHOD SUMMARY

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

FOOTNOTES

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

(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.

Sampled by the client.

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 criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here : http://www.sgs.com.au/~/media/Local/Australia/Documents/ Technical%20Documents/MP-AU-ENV-QU-022%20QA%20QC%20Plan.pdf

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Envirolab Services Pty Ltd - Sydney | ABN 37 112 535 645

CERTIFICATE OF ANALYSIS 139015

Client:

Environmental Investigations
Suite 6.01, 55 Miller Street
Pyrmont
NSW 2009

Attention: Jessie Sixsmith

Sample log in details:

Your Reference:	**E22817, Guildford West**
No. of samples:	2 Soils
Date samples received / completed instructions received	11/12/15 / 11/12/15

Analysis Details:

Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	18/12/15 / 18/12/15
Date of Preliminary Report:	Not Issued

NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Jacinta Hurst
Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil		
Our Reference:	UNITS	139015-1
Your Reference	----------	QT-01
Date Sampled	----------	10/12/2015
Type of sample		Soil
Date extracted	-	14/12/2015
Date analysed	-	14/12/2015
TRHC$_6$ - C$_9$	mg/kg	<25
TRHC$_6$ - C$_{10}$	mg/kg	<25
vTPHC$_6$ - 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
Surrogate aaa-Trifluorotoluene	%	101

svTRH (C10-C40) in Soil		
Our Reference:	UNITS	139015-1
Your Reference	----------	QT-01
Date Sampled	----------	10/12/2015
Type of sample		Soil
Date extracted	-	14/12/2015
Date analysed	-	15/12/2015
TRHC$_{10}$ - C$_{14}$	mg/kg	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100
TRH>C$_{10}$-C$_{16}$	mg/kg	<50
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	mg/kg	<50
TRH>C$_{16}$-C$_{34}$	mg/kg	<100
TRH>C$_{34}$-C$_{40}$	mg/kg	<100
Surrogate o-Terphenyl	%	88

PAHs in Soil		
Our Reference:	UNITS	139015-1
Your Reference	----------	QT-01
Date Sampled	----------	10/12/2015
Type of sample		Soil
Date extracted	-	14/12/2015
Date analysed	-	14/12/2015
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5
Total Positive PAHs	mg/kg	NIL (+)VE
Surrogate p-Terphenyl-d14	%	95

Acid Extractable metals in soil		
Our Reference:	UNITS	139015-1
Your Reference	----------	QT-01
Date Sampled	----------	10/12/2015
Type of sample		Soil
Date prepared	-	14/12/2015
Date analysed	-	14/12/2015
Arsenic	mg/kg	7
Cadmium	mg/kg	<0.4
Chromium	mg/kg	22
Copper	mg/kg	16
Lead	mg/kg	19
Mercury	mg/kg	<0.1
Nickel	mg/kg	8
Zinc	mg/kg	35

Moisture		
Our Reference:	UNITS	139015-1
Your Reference	----------	QT-01
Date Sampled	----------	10/12/2015
Type of sample		Soil
Date prepared	-	14/12/2015
Date analysed	-	15/12/2015
Moisture	%	14

Method ID	Methodology Summary
Org-016	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-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-003	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-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'TEQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'TEQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'TEQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PAHs" is simply a sum of the positive individual PAHs.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Inorg-008	Moisture content determined by heating at 105+/-5 deg C for a minimum of 12 hours.

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			14/12/2015	[NT]	[NT]	LCS-3	14/12/2015
Date analysed	-			14/12/2015	[NT]	[NT]	LCS-3	14/12/2015
TRHC$_6$ - C$_9$	mg/kg	25	Org-016	<25	[NT]	[NT]	LCS-3	110%
TRHC$_6$ - C$_{10}$	mg/kg	25	Org-016	<25	[NT]	[NT]	LCS-3	110%
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	LCS-3	95%
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	LCS-3	108%
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS-3	113%
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	LCS-3	118%
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS-3	105%
naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	97	[NT]	[NT]	LCS-3	110%

QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			14/12/2015	[NT]	[NT]	LCS-3	14/12/2015
Date analysed	-			14/12/2015	[NT]	[NT]	LCS-3	14/12/2015
TRHC$_{10}$ - C$_{14}$	mg/kg	50	Org-003	<50	[NT]	[NT]	LCS-3	89%
TRHC$_{15}$ - C$_{28}$	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-3	77%
TRHC$_{29}$ - C$_{36}$	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-3	60%
TRH>C$_{10}$-C$_{16}$	mg/kg	50	Org-003	<50	[NT]	[NT]	LCS-3	89%
TRH>C$_{16}$-C$_{34}$	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-3	77%
TRH>C$_{34}$-C$_{40}$	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-3	60%
Surrogate o-Terphenyl	%		Org-003	91	[NT]	[NT]	LCS-3	115%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			14/12/2015	[NT]	[NT]	LCS-3	14/12/2015
Date analysed	-			14/12/2015	[NT]	[NT]	LCS-3	14/12/2015
Naphthalene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	LCS-3	116%
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	LCS-3	115%
Phenanthrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	LCS-3	100%
Anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	LCS-3	102%
Pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	LCS-3	109%
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	LCS-3	128%
Benzo(b,j+k) fluoranthene	mg/kg	0.2	Org-012	<0.2	[NT]	[NT]	[NR]	[NR]

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	[NT]	[NT]	LCS-3	118%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012	94	[NT]	[NT]	LCS-3	137%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			14/12/2015	[NT]	[NT]	LCS-12	14/12/2015
Date analysed	-			14/12/2015	[NT]	[NT]	LCS-12	14/12/2015
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	[NT]	[NT]	LCS-12	112%
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	[NT]	[NT]	LCS-12	105%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-12	108%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-12	114%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-12	105%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	[NT]	[NT]	LCS-12	81%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-12	102%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-12	104%

Report Comments:

Asbestos ID was analysed by Approved Identifier:	Not applicable for this job
Asbestos ID was authorised by Approved Signatory:	Not applicable for this job

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NR: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

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.

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: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-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.

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Jessie Sixsmith
Client	Environmental Investigations
Address	Suite 6.01, 55 Miller Street NSW 2009
Telephone	02 9516 0722
Facsimile	02 9516 0741
Email	Jessie.Sixsmith@eiaustralia.com.au
Project	**E22817 - Pavesi Street Guildford West**
Order Number	**E22817**
Samples	6

LABORATORY DETAILS

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Address	Unit 16, 33 Maddox St Alexandria NSW 2015
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SGS Reference	**SE147250 R0**
Date Received	16/12/2015
Date Reported	23/12/2015

COMMENTS

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

SIGNATORIES

Andy Sutton
Senior Organic Chemist

Dong Liang
Metals/Inorganics Team Leader

Kamrul Ahsan
Senior Chemist

Ly Kim Ha
Organic Section Head

VOCs in Water [AN433/AN434] Tested: 18/12/2015

PARAMETER	UOM	LOR	BH104M WATER - 15/12/2015 SE147250.001	BH106M WATER - 15/12/2015 SE147250.002	BH117M WATER - 15/12/2015 SE147250.003	GWQD-1 WATER - 15/12/2015 SE147250.004	QR-2 WATER - 15/12/2015 SE147250.005
Benzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
m/p-xylene	µg/L	1	<1	<1	<1	<1	<1
o-xylene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Xylenes	µg/L	1.5	<1.5	<1.5	<1.5	<1.5	<1.5
Total BTEX	µg/L	3	<3	<3	<3	<3	<3
Naphthalene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane (CFC-12)	µg/L	5	<5	<5	<5	-	-
Chloromethane	µg/L	5	<5	<5	<5	-	-
Vinyl chloride (Chloroethene)	µg/L	0.3	<0.3	<0.3	<0.3	-	-
Bromomethane	µg/L	10	<10	<10	<10	-	-
Chloroethane	µg/L	5	<5	<5	<5	-	-
Trichlorofluoromethane	µg/L	1	<1	<1	<1	-	-
Acetone (2-propanone)	µg/L	10	<10	<10	<10	-	-
Iodomethane	µg/L	5	<5	<5	<5	-	-
1,1-dichloroethene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Acrylonitrile	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Dichloromethane (Methylene chloride)	µg/L	5	<5	<5	<5	-	-
Allyl chloride	µg/L	2	<2	<2	<2	-	-
Carbon disulfide	µg/L	2	<2	<2	<2	-	-
trans-1,2-dichloroethene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
MtBE (Methyl-tert-butyl ether)	µg/L	2	<2	<2	<2	-	-
1,1-dichloroethane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Vinyl acetate	µg/L	10	<10	<10	<10	-	-
MEK (2-butanone)	µg/L	10	<10	<10	<10	-	-
cis-1,2-dichloroethene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Bromochloromethane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Chloroform (THM)	µg/L	0.5	<0.5	<0.5	<0.5	-	-
2,2-dichloropropane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,2-dichloroethane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,1,1-trichloroethane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,1-dichloropropene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Carbon tetrachloride	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Dibromomethane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,2-dichloropropane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	<0.5	<0.5	<0.5	-	-
2-nitropropane	µg/L	100	<100	<100	<100	-	-
Bromodichloromethane (THM)	µg/L	0.5	<0.5	<0.5	<0.5	-	-
MIBK (4-methyl-2-pentanone)	µg/L	5	<5	<5	<5	-	-
cis-1,3-dichloropropene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
trans-1,3-dichloropropene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,1,2-trichloroethane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,3-dichloropropane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Dibromochloromethane (THM)	µg/L	0.5	<0.5	<0.5	<0.5	-	-
2-hexanone (MBK)	µg/L	5	<5	<5	<5	-	-
1,2-dibromoethane (EDB)	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Tetrachloroethene (Perchloroethylene,PCE)	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,1,1,2-tetrachloroethane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Chlorobenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Bromoform (THM)	µg/L	0.5	<0.5	<0.5	<0.5	-	-
cis-1,4-dichloro-2-butene	µg/L	1	<1	<1	<1	-	-
Styrene (Vinyl benzene)	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,1,2,2-tetrachloroethane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,2,3-trichloropropane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
trans-1,4-dichloro-2-butene	µg/L	1	<1	<1	<1	-	-

VOCs in Water [AN433/AN434] Tested: 18/12/2015 (continued)

PARAMETER	UOM	LOR	BH104M WATER - 15/12/2015 SE147250.001	BH106M WATER - 15/12/2015 SE147250.002	BH117M WATER - 15/12/2015 SE147250.003	GWQD-1 WATER - 15/12/2015 SE147250.004	QR-2 WATER - 15/12/2015 SE147250.005
Isopropylbenzene (Cumene)	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Bromobenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
n-propylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
2-chlorotoluene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
4-chlorotoluene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,3,5-trimethylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
tert-butylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,2,4-trimethylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
sec-butylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,3-dichlorobenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,4-dichlorobenzene	µg/L	0.3	<0.3	<0.3	<0.3	-	-
p-isopropyltoluene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,2-dichlorobenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
n-butylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,2-dibromo-3-chloropropane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,2,4-trichlorobenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Hexachlorobutadiene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,2,3-trichlorobenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Total VOC	µg/L	10	-	-	-	-	-

VOCs in Water [AN433/AN434] Tested: 18/12/2015 (continued)

PARAMETER	UOM	LOR	Trip Spike WATER - 15/12/2015 SE147250.006
Benzene	µg/L	0.5	[101%]
Toluene	µg/L	0.5	[100%]
Ethylbenzene	µg/L	0.5	[97%]
m/p-xylene	µg/L	1	[97%]
o-xylene	µg/L	0.5	[99%]
Total Xylenes	µg/L	1.5	-
Total BTEX	µg/L	3	-
Naphthalene	µg/L	0.5	-
Dichlorodifluoromethane (CFC-12)	µg/L	5	-
Chloromethane	µg/L	5	-
Vinyl chloride (Chloroethene)	µg/L	0.3	-
Bromomethane	µg/L	10	-
Chloroethane	µg/L	5	-
Trichlorofluoromethane	µg/L	1	-
Acetone (2-propanone)	µg/L	10	-
Iodomethane	µg/L	5	-
1,1-dichloroethene	µg/L	0.5	-
Acrylonitrile	µg/L	0.5	-
Dichloromethane (Methylene chloride)	µg/L	5	-
Allyl chloride	µg/L	2	-
Carbon disulfide	µg/L	2	-
trans-1,2-dichloroethene	µg/L	0.5	-
MtBE (Methyl-tert-butyl ether)	µg/L	2	-
1,1-dichloroethane	µg/L	0.5	-
Vinyl acetate	µg/L	10	-
MEK (2-butanone)	µg/L	10	-
cis-1,2-dichloroethene	µg/L	0.5	-
Bromochloromethane	µg/L	0.5	-
Chloroform (THM)	µg/L	0.5	-
2,2-dichloropropane	µg/L	0.5	-
1,2-dichloroethane	µg/L	0.5	-
1,1,1-trichloroethane	µg/L	0.5	-
1,1-dichloropropene	µg/L	0.5	-
Carbon tetrachloride	µg/L	0.5	-
Dibromomethane	µg/L	0.5	-
1,2-dichloropropane	µg/L	0.5	-
Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	-
2-nitropropane	µg/L	100	-
Bromodichloromethane (THM)	µg/L	0.5	-
MIBK (4-methyl-2-pentanone)	µg/L	5	-
cis-1,3-dichloropropene	µg/L	0.5	-
trans-1,3-dichloropropene	µg/L	0.5	-
1,1,2-trichloroethane	µg/L	0.5	-
1,3-dichloropropane	µg/L	0.5	-
Dibromochloromethane (THM)	µg/L	0.5	-
2-hexanone (MBK)	µg/L	5	-
1,2-dibromoethane (EDB)	µg/L	0.5	-
Tetrachloroethene (Perchloroethylene,PCE)	µg/L	0.5	-
1,1,1,2-tetrachloroethane	µg/L	0.5	-
Chlorobenzene	µg/L	0.5	-
Bromoform (THM)	µg/L	0.5	-
cis-1,4-dichloro-2-butene	µg/L	1	-
Styrene (Vinyl benzene)	µg/L	0.5	-
1,1,2,2-tetrachloroethane	µg/L	0.5	-
1,2,3-trichloropropane	µg/L	0.5	-
trans-1,4-dichloro-2-butene	µg/L	1	-

VOCs in Water [AN433/AN434] Tested: 18/12/2015 (continued)

PARAMETER	UOM	LOR	Trip Spike WATER - 15/12/2015 SE147250.006
Isopropylbenzene (Cumene)	µg/L	0.5	-
Bromobenzene	µg/L	0.5	-
n-propylbenzene	µg/L	0.5	-
2-chlorotoluene	µg/L	0.5	-
4-chlorotoluene	µg/L	0.5	-
1,3,5-trimethylbenzene	µg/L	0.5	-
tert-butylbenzene	µg/L	0.5	-
1,2,4-trimethylbenzene	µg/L	0.5	-
sec-butylbenzene	µg/L	0.5	-
1,3-dichlorobenzene	µg/L	0.5	-
1,4-dichlorobenzene	µg/L	0.3	-
p-isopropyltoluene	µg/L	0.5	-
1,2-dichlorobenzene	µg/L	0.5	-
n-butylbenzene	µg/L	0.5	-
1,2-dibromo-3-chloropropane	µg/L	0.5	-
1,2,4-trichlorobenzene	µg/L	0.5	-
Hexachlorobutadiene	µg/L	0.5	-
1,2,3-trichlorobenzene	µg/L	0.5	-
Total VOC	µg/L	10	-

Volatile Petroleum Hydrocarbons in Water [AN433/AN434/AN410] Tested: 18/12/2015

PARAMETER	UOM	LOR	BH104M WATER - 15/12/2015 SE147250.001	BH106M WATER - 15/12/2015 SE147250.002	BH117M WATER - 15/12/2015 SE147250.003	GWQD-1 WATER - 15/12/2015 SE147250.004	QR-2 WATER - 15/12/2015 SE147250.005
TRH C6-C9	µg/L	40	<40	<40	<40	<40	<40
Benzene (F0)	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TRH C6-C10	µg/L	50	<50	<50	<50	<50	<50
TRH C6-C10 minus BTEX (F1)	µg/L	50	<50	<50	<50	<50	<50

TRH (Total Recoverable Hydrocarbons) in Water [AN403] Tested: 17/12/2015

PARAMETER	UOM	LOR	BH104M WATER - 15/12/2015 SE147250.001	BH106M WATER - 15/12/2015 SE147250.002	BH117M WATER - 15/12/2015 SE147250.003	GWQD-1 WATER - 15/12/2015 SE147250.004	QR-2 WATER - 15/12/2015 SE147250.005
TRH C10-C14	µg/L	50	<50	<50	<50	<50	<50
TRH C15-C28	µg/L	200	<200	<200	<200	<200	<200
TRH C29-C36	µg/L	200	<200	<200	<200	<200	<200
TRH C37-C40	µg/L	200	<200	<200	<200	<200	<200
TRH >C10-C16 (F2)	µg/L	60	<60	<60	<60	<60	<60
TRH >C16-C34 (F3)	µg/L	500	<500	<500	<500	<500	<500
TRH >C34-C40 (F4)	µg/L	500	<500	<500	<500	<500	<500
TRH C10-C36	µg/L	450	<450	<450	<450	<450	<450
TRH C10-C40	µg/L	650	<650	<650	<650	<650	<650

PAH (Polynuclear Aromatic Hydrocarbons) in Water [AN420] Tested: 17/12/2015

PARAMETER	UOM	LOR	BH104M WATER - 15/12/2015 SE147250.001	BH106M WATER - 15/12/2015 SE147250.002	BH117M WATER - 15/12/2015 SE147250.003
Naphthalene	µg/L	0.1	<0.1	<0.1	**0.1**
2-methylnaphthalene	µg/L	0.1	<0.1	<0.1	**0.1**
1-methylnaphthalene	µg/L	0.1	<0.1	<0.1	**0.1**
Acenaphthylene	µg/L	0.1	<0.1	<0.1	<0.1
Acenaphthene	µg/L	0.1	<0.1	<0.1	<0.1
Fluorene	µg/L	0.1	<0.1	<0.1	<0.1
Phenanthrene	µg/L	0.1	<0.1	<0.1	<0.1
Anthracene	µg/L	0.1	<0.1	<0.1	<0.1
Fluoranthene	µg/L	0.1	<0.1	<0.1	<0.1
Pyrene	µg/L	0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	0.1	<0.1	<0.1	<0.1
Chrysene	µg/L	0.1	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	µg/L	0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	µg/L	0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	µg/L	0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1	<0.1	<0.1
Dibenzo(a&h)anthracene	µg/L	0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	µg/L	0.1	<0.1	<0.1	<0.1
Total PAH (18)	µg/L	1	<1	<1	<1

Trace Metals (Dissolved) in Water by ICPMS [AN318] Tested: 18/12/2015

PARAMETER	UOM	LOR	BH104M WATER - 15/12/2015 SE147250.001	BH106M WATER - 15/12/2015 SE147250.002	BH117M WATER - 15/12/2015 SE147250.003	GWQD-1 WATER - 15/12/2015 SE147250.004	QR-2 WATER - 15/12/2015 SE147250.005
Arsenic, As	µg/L	1	<1	4	3	<1	<1
Cadmium, Cd	µg/L	0.1	1.9	0.1	0.2	1.8	<0.1
Chromium, Cr	µg/L	1	<1	<1	<1	<1	<1
Copper, Cu	µg/L	1	10	9	3	6	<1
Lead, Pb	µg/L	1	<1	<1	<1	<1	<1
Nickel, Ni	µg/L	1	160	39	16	150	<1
Zinc, Zn	µg/L	5	2600	140	180	2600	<5

Mercury (dissolved) in Water [AN311/AN312] Tested: 22/12/2015

PARAMETER	UOM	LOR	BH104M WATER - 15/12/2015 SE147250.001	BH106M WATER - 15/12/2015 SE147250.002	BH117M WATER - 15/12/2015 SE147250.003	GWQD-1 WATER - 15/12/2015 SE147250.004	QR-2 WATER - 15/12/2015 SE147250.005
Mercury	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<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/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, in accordance with USEPA 6020A.
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 not corrected for Naphthalene.
AN403	Additionally, the volatile C6-C9/C6-C10 fractions may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Petroleum Hydrocarbons (TPH) 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).
AN433/AN434/AN410	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.
AN433/AN434	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.

FOOTNOTES

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

Samples 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 calcuated 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.

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here : http://www.sgs.com.au/~/media/Local/Australia/Documents/ Technical%20Documents/MP-AU-ENV-QU-022%20QA%20QC%20Plan.pdf

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CERTIFICATE OF ANALYSIS 139287

Client:

Environmental Investigations
Suite 6.01, 55 Miller Street
Pyrmont
NSW 2009

Attention: Jessie Sixsmith

Sample log in details:

Your Reference:	**E22817, Guildford West**
No. of samples:	1 Water
Date samples received / completed instructions received	17/12/15 / 17/12/15

Analysis Details:

Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	4/01/16 / 22/12/15
Date of Preliminary Report:	Not Issued

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

Results Approved By:

Jacinta Hurst
Laboratory Manager

ACCREDITED FOR TECHNICAL COMPETENCE

vTRH(C6-C10)/BTEXN in Water		
Our Reference:	UNITS	139287-1
Your Reference	---------- -	GWQT-1
Date Sampled	----------	15/12/15
Type of sample		Water
Date extracted	-	17/12/2015
Date analysed	-	18/12/2015
$TRHC_6$ - C_9	µg/L	<10
$TRHC_6$ - C_{10}	µg/L	<10
$TRHC_6$ - C_{10} less BTEX (F1)	µg/L	<10
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Naphthalene	µg/L	<1
Surrogate Dibromofluoromethane	%	105
Surrogate toluene-d8	%	100
Surrogate 4-BFB	%	94

svTRH (C10-C40) in Water		
Our Reference:	UNITS	139287-1
Your Reference	----------	GWQT-1
	-	
Date Sampled	----------	15/12/15
Type of sample		Water
Date extracted	-	17/12/2015
Date analysed	-	18/12/2015
$TRHC_{10}$ - C_{14}	µg/L	<50
$TRHC_{15}$ - C_{28}	µg/L	<100
$TRHC_{29}$ - C_{36}	µg/L	<100
$TRH>C_{10}$ - C_{16}	µg/L	<50
$TRH>C_{10}$ - C_{16} less Naphthalene (F2)	µg/L	<50
$TRH>C_{16}$ - C_{34}	µg/L	<100
$TRH>C_{34}$ - C_{40}	µg/L	<100
Surrogate o-Terphenyl	%	80

HM in water - dissolved		
Our Reference:	UNITS	139287-1
Your Reference	----------	GWQT-1
	-	
Date Sampled	----------	15/12/15
Type of sample		Water
Date prepared	-	18/12/2015
Date analysed	-	18/12/2015
Arsenic-Dissolved	µg/L	<1
Cadmium-Dissolved	µg/L	1.9
Chromium-Dissolved	µg/L	<1
Copper-Dissolved	µg/L	8
Lead-Dissolved	µg/L	<1
Mercury-Dissolved	µg/L	<0.05
Nickel-Dissolved	µg/L	150
Zinc-Dissolved	µg/L	2,000

Method ID	Methodology Summary
Org-016	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-013	Water samples are analysed directly by purge and trap GC-MS.
Org-003	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.
Metals-022 ICP-MS	Determination of various metals by ICP-MS.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			17/12/2015	[NT]	[NT]	LCS-W3	17/12/2015
Date analysed	-			18/12/2015	[NT]	[NT]	LCS-W3	18/12/2015
TRH C_6 - C_9	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-W3	99%
TRH C_6 - C_{10}	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-W3	99%
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W3	96%
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W3	99%
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W3	100%
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	LCS-W3	101%
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W3	102%
Naphthalene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Surrogate Dibromofluoromethane	%		Org-016	103	[NT]	[NT]	LCS-W3	101%
Surrogate toluene-d8	%		Org-016	100	[NT]	[NT]	LCS-W3	100%
Surrogate 4-BFB	%		Org-016	95	[NT]	[NT]	LCS-W3	107%

QUALITY CONTROL svTRH (C10-C40) in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			18/12/2015	[NT]	[NT]	LCS-W1	18/12/2015
Date analysed	-			18/12/2015	[NT]	[NT]	LCS-W1	18/12/2015
TRH C_{10} - C_{14}	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W1	103%
TRH C_{15} - C_{28}	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	79%
TRH C_{29} - C_{36}	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	73%
TRH>C_{10} - C_{16}	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W1	103%
TRH>C_{16} - C_{34}	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	79%
TRH>C_{34} - C_{40}	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	73%
Surrogate o-Terphenyl	%		Org-003	85	[NT]	[NT]	LCS-W1	106%

QUALITY CONTROL HM in water - dissolved	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			18/12/2015	[NT]	[NT]	LCS-W1	18/12/2015
Date analysed	-			18/12/2015	[NT]	[NT]	LCS-W1	18/12/2015
Arsenic-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W1	99%
Cadmium-Dissolved	µg/L	0.1	Metals-022 ICP-MS	<0.1	[NT]	[NT]	LCS-W1	103%
Chromium-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W1	93%
Copper-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W1	96%
Lead-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W1	103%

QUALITY CONTROL HM in water - dissolved	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Mercury-Dissolved	µg/L	0.05	Metals-021 CV-AAS	<0.05	[NT]	[NT]	LCS-W1	96%
Nickel-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W1	98%
Zinc-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W1	98%

Report Comments:

Asbestos ID was analysed by Approved Identifier:	Not applicable for this job
Asbestos ID was authorised by Approved Signatory:	Not applicable for this job

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NR: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

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.

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: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-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.

APPENDIX G
QA/QC Assessment

G1 QUALITY CONTROL PROGRAM

G1.1 INTRODUCTION

For the purpose of assessing the quality of data presented in this Remediation and Validation 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 QC samples. Details of the field and laboratory QC samples are provided, with the allowable acceptance ranges for the data presented in Table G-1.

Table G-1 Sampling Data Quality Indicators

Data Quality Objective	Data Quality Indicator	Acceptable Range
Accuracy	Field – Trip blank (laboratory prepared) Laboratory – Laboratory control spike and matrix spike	< laboratory limit of reporting (LOR) Prescribed by the laboratories
Precision	Field – Blind replicate and spilt duplicate Laboratory – Laboratory duplicate and matrix spike duplicate	< 30 % relative percentage difference (RPD [%]) Prescribed by the laboratories
Representativeness	Field – Trip blank (laboratory prepared) Laboratory – Method blank	< laboratory limit of reporting (LOR) Prescribed by the laboratories
Completeness	Completion (%)	-

G1.2 CALCULATION OF RELATIVE PERCENTAGE DIFFERENCE (RPD)

The RPD values were calculated using the following equation:

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

C_O = Concentration obtained from the primary sample.

C_R = Concentration obtained from the blind replicate or split sample.

G2 FIELD QA/QC DATA EVALUATION

The field quality assurance/quality control (QA/QC) soil samples collected during the Remediation and Validation works were as follows:

- Blind field duplicate;
- Inter laboratory duplicates;
- Trip blanks; and
- Rinsate Blank.

The results of the QA/QC samples collected during the investigation and validation phases of sampling, including the calculated RPD values between primary and duplicate samples, are presented in Table G-2 .

G2.1 SOIL INVESTIGATION & SOIL VALIDATION

G2.1.1 Blind Field Duplicate

One (1) blind field duplicate (BFD) sample was collected for each sampling event. The preparation of the BFD sample 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 sample was then presented blind to the primary laboratory (SGS) to avoid any potential analytical bias. The BFD was analysed for TPH, BTEX, selected heavy metals with the RPD values calculated found to be within the Data Acceptance Criteria.

G2.1.2 Inter Laboratory Duplicate

One (1) inter laboratory duplicate (ILD) sample was collected for each sampling event. The preparation of the ILD sample was identical to the BFD sample as described above and analysed for TPH, BTEX and selected heavy metals. The RPD values calculated for the ILD sample was found to be within the Data Acceptance Criteria, with the exception of Mercury (133.33%) for soil investigation sample QT-01 due to small variations in concentrations being reported.

Furthermore, soil samples were placed immediately into jars following sampling to reduce the loss of volatiles from samples. Results of soil sampling indicated that the samples collected were representative of the soils present at respective sampling locations; therefore, EI conclude that the samples collected are representative of the soils present at the respective sampling locations.

G2.1.3 Trip Blank

One (1) trip blank (TB) sample, prepared by the primary laboratory, was analysed for BTEX by the primary laboratory. The soil TB sample results were reported below the laboratory LOR, indicating that ideal sample transport and handling conditions were achieved.

Table G-2 Summary of QA/QC results for soil investigation samples

Sample identification	Description	TRH				BTEX				Heavy Metals							
		F1*	F2**	F3 (>C6- C34)	F4 (>C34- C40)	Benzene	Toluene	Ethylbenzene	Xylene (total)	Arsenic	Cadmium	Chromium (Tota	Copper	Lead	Mercury	Nickel	Zinc
Intra-laboratory Duplicate - Soil Investigation																	
BH102_0.0-0.1	Fill	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	7	0.5	18	16	20	0.02	7.5	45
QD-01	BFD of BH102_0.0-0.1	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	8	0.6	16	13	22	0.02	7.1	39
RPD		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.33	18.18	11.76	20.69	9.52	0.00	5.48	14.29
Inter-laboratory Duplicate - Soil Investigation																	
BH102_0.0-0.1	Fill	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	7	0.5	18	16	20	0.02	7.5	45
QT-01	ILD of BH102_0.0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<2	7	<0.4	22	16	19	<0.1	8	35
RPD		0.00	NA	NA	NA	NA	NA	NA	NA	0.00	22.22	20.00	0.00	5.13	133.33	6.45	25.00
Rinsate Blanks																	
QR-01	De-ionised water	<50	<60	<500	<500	<0.5	<0.5	<0.5	<1.5	<1	<0.1	<1	1	<1	<0.0001	<1	<5

NOTE: All results are reported in mg/kg (soil) or µg/L (water)

66.67 RPD calculated by halving detection limit exceeds 30-50% range referenced from AS4482.1 (2005)

52.87 RPD exceeds 30-50% range referenced from AS4482.1 (2005)

G2.1.4 Rinsate Blank

One (1) rinsate blank (RB) sample per sampling event was submitted to the primary laboratory for TPH, BTEX and selected heavy metals. The RB sample results were reported below the laboratory LOR, therefore it was concluded that decontamination procedures performed during the field works had been effective.

G2.2 GROUNDWATER INVESTIGATION

The field quality assurance/quality control (QA/QC) groundwater samples collected during the data gap closure works were as follows:

- Blind field duplicate;
- Inter laboratory duplicates;
- Trip blanks; and
- Rinsate Blank.

The results of the QA/QC samples collected during the supplementary groundwater investigation, including the calculated RPD values between primary and duplicate samples, are presented in Table G-4.

G2.2.1 Blind Field Duplicate

One (1) blind field duplicate (BFD) sample, being sample GWQD-01, was collected from the primary sample BH104M. The preparation of the BFD sample involved the involved the decanting of the groundwater collected from the respective groundwater 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. It should be noted that the sample was not mixed 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 BFD was analysed for TPH, BTEX and selected heavy metals. The RPD values calculated for the majority of the analytes tested were found to be within the Data Acceptance Criteria (DAC).

G2.2.2 Inter-Laboratory Duplicate

One (1) inter laboratory duplicate (ILD) sample, being sample GWI-2, was collected from the primary sample GW5-1. The preparation of the ILD sample was identical to the BFD sample as described above and analysed for TPH, BTEX and selected heavy metals. The RPD values calculated for the ILD sample were found to be within the Data Acceptance Criteria.

G2.2.3 Assessment of Field QA/QC Data

All groundwater samples were field tested and assessed on any observable signs of contamination based on visual and odour assessment.

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 remediation and validation works to be appropriate and the results to be acceptable.

Table G-4 Summary of QA/QC results for groundwater samples

Sample identification	Description	TRH				BTEX				Heavy Metals							
		F1*	F2**	F3 (>C6- C34)	F4 (>C34- C40)	Benzene	Toluene	Ethylbenzene	Xylene (total)	Arsenic	Cadmium	Chromium (Total)	Copper	Lead	Mercury	Nickel	Zinc
Intra-laboratory Duplicate - Groundwater Investigation																	
BH104M	Groundwater	<50	<60	<500	<500	<0.5	<0.5	<0.5	<1.5	<1	1.9	<1	10	<1	<0.1	160	2600
GWQD-01	BFD of BH104M	<50	<60	<500	<500	<0.5	<0.5	<0.5	<1.5	<1	1.8	<1	6	<1	<0.1	150	2600
	RPD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.41	0.00	50.00	0.00	0.00	6.45	0.00
Inter-laboratory Duplicate - Groundwater Investigation																	
BH104M	Groundwater	<50	<60	<500	<500	<0.5	<0.5	<0.5	<1.5	<1	1.9	<1	10	<1	<0.1	160	2600
GWQT-01	ILD of BH104M	<10	<50	<100	<100	<1	<1	<1	<1	<1	1.9	<1	8	<1	<0.05	150	2000
	RPD	NA	NA	NA	NA	NA	NA	NA	NA	0.00	0.00	0.00	22.22	0.00	NA	6.45	26.09

NOTE: All results are reported in mg/kg (soil) or µg/L (water)

66.67 RPD calculated by halving detection limit exceeds 30-50% range referenced from AS4482.1 (2005)

66.67 RPD exceeds 30-50% range referenced from AS4482.1 (2005)

G3 LABORATORY QA/QC

G3.1 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, respective tests are 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.

G3.2 SAMPLE HOLDING TIMES

All sample holding times were generally within standard environmental protocols as tabulated in Appendix H, Tables QC1 and QC2.

G3.3 TEST METHODS AND PRACTICAL QUANTITATION LIMITS (PQLS)

Practical Quantitation Limits for the tested parameters during the assessments of soils are presented in Appendix H, Tables QC3 and QC4.

G3.4 METHOD BLANKS

Concentrations of all parameters in method blanks during the assessment were below the laboratory PQLs and were therefore within the DAC.

G3.5 LABORATORY DUPLICATE SAMPLES

The Laboratory Control Samples (LCS) for the analysis batches were within acceptable ranges and conformed to the DAC, with the exception of Chromium for SE147094.018 due to sample heterogeneity.

G3.6 LABORATORY CONTROL SAMPLES

The Laboratory Control Samples (LCS) for the analysis batches were within acceptable ranges and conformed to the DAC.

G3.7 MATRIX SPIKES

The matrix spikes of the analysis batches were within acceptable ranges and conformed to the DAC, with the exception of samples SE147082.020 whose recovery in Mercury exceeded the acceptance criteria due to matrix interference, SE147082.020 for Chromium, lead and nickel due to matrix interference, SE147094A.03 for TRH C10-C14, C15-C28, >C10-C16 (F2) and >C16-C34 (F3) due to matrix interference and SE147247.001 for Arsenic due to matrix interference.

APPENDIX H
Laboratory QA/AC Policies and DQOs

STATEMENT OF QA/QC PERFORMANCE

SE147094 R0

CLIENT DETAILS

Contact	Jessie Sixsmith
Client	Environmental Investigations
Address	Suite 6.01, 55 Miller Street NSW 2009
Telephone	02 9516 0722
Facsimile	02 9516 0741
Email	Jessie.Sixsmith@eiaustralia.com.au
Project	**E22817 37-39 Pavesi St, Guildford West**
Order Number	**E22817**
Samples	34

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE147094 R0**
Date Received	11 Dec 2015
Date Reported	18 Dec 2015

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS Environmental Services' 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 and was supplied by the Client.
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 Metals in Soil by ICPOES	1 item
Matrix Spike	Mercury in Soil	1 item
	Total Recoverable Metals in Soil by ICPOES	3 items

SAMPLE SUMMARY

Sample counts by matrix	33 Soils, 1 Water	Type of documentation received	COC
Date documentation received	11/12/2015	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	11.6°C
Sample container provider	SGS	Turnaround time requested	Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	Ice Bricks	Samples clearly labelled	Yes
Complete documentation received	Yes		

HOLDING TIME SUMMARY

SE147094 R0

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

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

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Fibre Identification in soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101_0.0-0.1	SE147094.001	LB092021	10 Dec 2015	11 Dec 2015	09 Dec 2016	17 Dec 2015	09 Dec 2016	18 Dec 2015
BH102_0.0-0.1	SE147094.003	LB092021	10 Dec 2015	11 Dec 2015	09 Dec 2016	17 Dec 2015	09 Dec 2016	18 Dec 2015
BH103_0.0-0.1	SE147094.004	LB092021	10 Dec 2015	11 Dec 2015	09 Dec 2016	17 Dec 2015	09 Dec 2016	18 Dec 2015
BH104M_0.0-0.1	SE147094.005	LB092021	10 Dec 2015	11 Dec 2015	09 Dec 2016	17 Dec 2015	09 Dec 2016	18 Dec 2015
BH105_0.0-0.1	SE147094.007	LB092021	10 Dec 2015	11 Dec 2015	09 Dec 2016	17 Dec 2015	09 Dec 2016	18 Dec 2015
BH106M_0.2-0.3	SE147094.008	LB092021	10 Dec 2015	11 Dec 2015	09 Dec 2016	17 Dec 2015	09 Dec 2016	18 Dec 2015
BH107_0.2-0.3	SE147094.011	LB092021	10 Dec 2015	11 Dec 2015	09 Dec 2016	17 Dec 2015	09 Dec 2016	18 Dec 2015
BH108_0.2-0.3	SE147094.012	LB092021	10 Dec 2015	11 Dec 2015	09 Dec 2016	17 Dec 2015	09 Dec 2016	18 Dec 2015
BH109_0.2-0.3	SE147094.013	LB092021	10 Dec 2015	11 Dec 2015	09 Dec 2016	17 Dec 2015	09 Dec 2016	18 Dec 2015
BH110_0.3-0.4	SE147094.015	LB092021	10 Dec 2015	11 Dec 2015	09 Dec 2016	17 Dec 2015	09 Dec 2016	18 Dec 2015
BH111_0.2-0.3	SE147094.016	LB092021	10 Dec 2015	11 Dec 2015	09 Dec 2016	17 Dec 2015	09 Dec 2016	18 Dec 2015
BH112_0.2-0.3	SE147094.018	LB092021	10 Dec 2015	11 Dec 2015	09 Dec 2016	17 Dec 2015	09 Dec 2016	18 Dec 2015
BH113_0.2-0.3	SE147094.019	LB092021	10 Dec 2015	11 Dec 2015	09 Dec 2016	17 Dec 2015	09 Dec 2016	18 Dec 2015
BH114_0.2-0.3	SE147094.020	LB092021	10 Dec 2015	11 Dec 2015	09 Dec 2016	17 Dec 2015	09 Dec 2016	18 Dec 2015
BH115_0.2-0.3	SE147094.022	LB092021	10 Dec 2015	11 Dec 2015	09 Dec 2016	17 Dec 2015	09 Dec 2016	18 Dec 2015
BH116_0.2-0.3	SE147094.024	LB092021	10 Dec 2015	11 Dec 2015	09 Dec 2016	17 Dec 2015	09 Dec 2016	18 Dec 2015
BH117_0.0-0.1	SE147094.025	LB092021	10 Dec 2015	11 Dec 2015	09 Dec 2016	17 Dec 2015	09 Dec 2016	18 Dec 2015
BH118_0.0-0.1	SE147094.027	LB092021	10 Dec 2015	11 Dec 2015	09 Dec 2016	17 Dec 2015	09 Dec 2016	18 Dec 2015
BH119_0.0-0.1	SE147094.029	LB092021	10 Dec 2015	11 Dec 2015	09 Dec 2016	17 Dec 2015	09 Dec 2016	18 Dec 2015
SP1-1	SE147094.033	LB092021	10 Dec 2015	11 Dec 2015	09 Dec 2016	17 Dec 2015	09 Dec 2016	18 Dec 2015
SP1-2	SE147094.034	LB092021	10 Dec 2015	11 Dec 2015	09 Dec 2016	17 Dec 2015	09 Dec 2016	18 Dec 2015

Mercury (dissolved) in Water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QR-01	SE147094.031	LB091971	10 Dec 2015	11 Dec 2015	07 Jan 2016	17 Dec 2015	07 Jan 2016	17 Dec 2015

Mercury in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101_0.0-0.1	SE147094.001	LB091900	10 Dec 2015	11 Dec 2015	07 Jan 2016	16 Dec 2015	07 Jan 2016	17 Dec 2015
BH101_0.4-0.5	SE147094.002	LB091900	10 Dec 2015	11 Dec 2015	07 Jan 2016	16 Dec 2015	07 Jan 2016	17 Dec 2015
BH102_0.0-0.1	SE147094.003	LB091900	10 Dec 2015	11 Dec 2015	07 Jan 2016	16 Dec 2015	07 Jan 2016	17 Dec 2015
BH103_0.0-0.1	SE147094.004	LB091900	10 Dec 2015	11 Dec 2015	07 Jan 2016	16 Dec 2015	07 Jan 2016	17 Dec 2015
BH104M_0.4-0.5	SE147094.006	LB091900	10 Dec 2015	11 Dec 2015	07 Jan 2016	16 Dec 2015	07 Jan 2016	17 Dec 2015
BH105_0.0-0.1	SE147094.007	LB091900	10 Dec 2015	11 Dec 2015	07 Jan 2016	16 Dec 2015	07 Jan 2016	17 Dec 2015
BH106M_0.6-0.7	SE147094.009	LB091900	10 Dec 2015	11 Dec 2015	07 Jan 2016	16 Dec 2015	07 Jan 2016	17 Dec 2015
BH106M_0.9-1.0	SE147094.010	LB091900	10 Dec 2015	11 Dec 2015	07 Jan 2016	16 Dec 2015	07 Jan 2016	17 Dec 2015
BH107_0.2-0.3	SE147094.011	LB091900	10 Dec 2015	11 Dec 2015	07 Jan 2016	16 Dec 2015	07 Jan 2016	17 Dec 2015
BH108_0.2-0.3	SE147094.012	LB091900	10 Dec 2015	11 Dec 2015	07 Jan 2016	16 Dec 2015	07 Jan 2016	17 Dec 2015
BH109_0.2-0.3	SE147094.013	LB091900	10 Dec 2015	11 Dec 2015	07 Jan 2016	16 Dec 2015	07 Jan 2016	17 Dec 2015
BH109_0.7-0.8	SE147094.014	LB091900	10 Dec 2015	11 Dec 2015	07 Jan 2016	16 Dec 2015	07 Jan 2016	17 Dec 2015
BH110_0.3-0.4	SE147094.015	LB091900	10 Dec 2015	11 Dec 2015	07 Jan 2016	16 Dec 2015	07 Jan 2016	17 Dec 2015
BH111_0.2-0.3	SE147094.016	LB091900	10 Dec 2015	11 Dec 2015	07 Jan 2016	16 Dec 2015	07 Jan 2016	17 Dec 2015
BH111_1.1-1.2	SE147094.017	LB091900	10 Dec 2015	11 Dec 2015	07 Jan 2016	16 Dec 2015	07 Jan 2016	17 Dec 2015
BH112_0.2-0.3	SE147094.018	LB091900	10 Dec 2015	11 Dec 2015	07 Jan 2016	16 Dec 2015	07 Jan 2016	17 Dec 2015
BH113_0.2-0.3	SE147094.019	LB091901	10 Dec 2015	11 Dec 2015	07 Jan 2016	16 Dec 2015	07 Jan 2016	17 Dec 2015
BH114_0.2-0.3	SE147094.020	LB091901	10 Dec 2015	11 Dec 2015	07 Jan 2016	16 Dec 2015	07 Jan 2016	17 Dec 2015
BH114_1.0-1.1	SE147094.021	LB091901	10 Dec 2015	11 Dec 2015	07 Jan 2016	16 Dec 2015	07 Jan 2016	17 Dec 2015
BH115_0.2-0.3	SE147094.022	LB091901	10 Dec 2015	11 Dec 2015	07 Jan 2016	16 Dec 2015	07 Jan 2016	17 Dec 2015
BH115_0.5-0.6	SE147094.023	LB091901	10 Dec 2015	11 Dec 2015	07 Jan 2016	16 Dec 2015	07 Jan 2016	17 Dec 2015
BH116_0.2-0.3	SE147094.024	LB091901	10 Dec 2015	11 Dec 2015	07 Jan 2016	16 Dec 2015	07 Jan 2016	17 Dec 2015
BH117_0.0-0.1	SE147094.025	LB091901	10 Dec 2015	11 Dec 2015	07 Jan 2016	16 Dec 2015	07 Jan 2016	17 Dec 2015
BH117M_1.0-1.1	SE147094.026	LB091901	10 Dec 2015	11 Dec 2015	07 Jan 2016	16 Dec 2015	07 Jan 2016	17 Dec 2015
BH118_0.4-0.8	SE147094.028	LB091901	10 Dec 2015	11 Dec 2015	07 Jan 2016	16 Dec 2015	07 Jan 2016	17 Dec 2015
BH119_0.0-0.1	SE147094.029	LB091901	10 Dec 2015	11 Dec 2015	07 Jan 2016	16 Dec 2015	07 Jan 2016	17 Dec 2015
QD-01	SE147094.030	LB091901	10 Dec 2015	11 Dec 2015	07 Jan 2016	16 Dec 2015	07 Jan 2016	17 Dec 2015
SP1-1	SE147094.033	LB091901	10 Dec 2015	11 Dec 2015	07 Jan 2016	16 Dec 2015	07 Jan 2016	17 Dec 2015
SP1-2	SE147094.034	LB091901	10 Dec 2015	11 Dec 2015	07 Jan 2016	16 Dec 2015	07 Jan 2016	17 Dec 2015

Moisture Content

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

Sample Name	Sample No.	QC Ref

HOLDING TIME SUMMARY

SE147094 R0

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

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

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Moisture Content (continued)

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101_0.0-0.1	SE147094.001	LB091691	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	19 Dec 2015	15 Dec 2015
BH101_0.4-0.5	SE147094.002	LB091691	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	19 Dec 2015	15 Dec 2015
BH102_0.0-0.1	SE147094.003	LB091691	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	19 Dec 2015	15 Dec 2015
BH103_0.0-0.1	SE147094.004	LB091691	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	19 Dec 2015	15 Dec 2015
BH104M_0.4-0.5	SE147094.006	LB091691	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	19 Dec 2015	15 Dec 2015
BH105_0.0-0.1	SE147094.007	LB091691	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	19 Dec 2015	15 Dec 2015
BH106M_0.6-0.7	SE147094.009	LB091691	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	19 Dec 2015	15 Dec 2015
BH106M_0.9-1.0	SE147094.010	LB091691	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	19 Dec 2015	15 Dec 2015
BH107_0.2-0.3	SE147094.011	LB091691	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	19 Dec 2015	15 Dec 2015
BH108_0.2-0.3	SE147094.012	LB091691	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	19 Dec 2015	15 Dec 2015
BH109_0.2-0.3	SE147094.013	LB091691	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	19 Dec 2015	15 Dec 2015
BH109_0.7-0.8	SE147094.014	LB091691	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	19 Dec 2015	15 Dec 2015
BH110_0.3-0.4	SE147094.015	LB091691	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	19 Dec 2015	15 Dec 2015
BH111_0.2-0.3	SE147094.016	LB091691	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	19 Dec 2015	15 Dec 2015
BH111_1.1-1.2	SE147094.017	LB091691	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	19 Dec 2015	15 Dec 2015
BH112_0.2-0.3	SE147094.018	LB091691	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	19 Dec 2015	15 Dec 2015
BH113_0.2-0.3	SE147094.019	LB091691	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	19 Dec 2015	15 Dec 2015
BH114_0.2-0.3	SE147094.020	LB091691	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	19 Dec 2015	15 Dec 2015
BH114_1.0-1.1	SE147094.021	LB091691	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	19 Dec 2015	15 Dec 2015
BH115_0.2-0.3	SE147094.022	LB091691	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	19 Dec 2015	15 Dec 2015
BH115_0.5-0.6	SE147094.023	LB091691	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	19 Dec 2015	15 Dec 2015
BH116_0.2-0.3	SE147094.024	LB091691	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	19 Dec 2015	15 Dec 2015
BH117_0.0-0.1	SE147094.025	LB091691	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	19 Dec 2015	15 Dec 2015
BH117M_1.0-1.1	SE147094.026	LB091691	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	19 Dec 2015	15 Dec 2015
BH118_0.4-0.8	SE147094.028	LB091691	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	19 Dec 2015	15 Dec 2015
BH119_0.0-0.1	SE147094.029	LB091691	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	19 Dec 2015	15 Dec 2015
QD-01	SE147094.030	LB091691	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	19 Dec 2015	15 Dec 2015
Trip Blank	SE147094.032	LB091691	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	19 Dec 2015	15 Dec 2015
SP1-1	SE147094.033	LB091691	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	19 Dec 2015	15 Dec 2015
SP1-2	SE147094.034	LB091691	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	19 Dec 2015	15 Dec 2015

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN400/AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101_0.0-0.1	SE147094.001	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH101_0.4-0.5	SE147094.002	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH102_0.0-0.1	SE147094.003	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH103_0.0-0.1	SE147094.004	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH104M_0.4-0.5	SE147094.006	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH105_0.0-0.1	SE147094.007	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH106M_0.6-0.7	SE147094.009	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH106M_0.9-1.0	SE147094.010	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH107_0.2-0.3	SE147094.011	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH108_0.2-0.3	SE147094.012	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH109_0.2-0.3	SE147094.013	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH109_0.7-0.8	SE147094.014	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH110_0.3-0.4	SE147094.015	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH111_0.2-0.3	SE147094.016	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH111_1.1-1.2	SE147094.017	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH112_0.2-0.3	SE147094.018	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH113_0.2-0.3	SE147094.019	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH114_0.2-0.3	SE147094.020	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH114_1.0-1.1	SE147094.021	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH115_0.2-0.3	SE147094.022	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH115_0.5-0.6	SE147094.023	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH116_0.2-0.3	SE147094.024	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH117_0.0-0.1	SE147094.025	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH117M_1.0-1.1	SE147094.026	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH118_0.4-0.8	SE147094.028	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH119_0.0-0.1	SE147094.029	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
QD-01	SE147094.030	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015

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 sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

OC Pesticides in Soil (continued)

Method: ME-(AU)-[ENV]AN400/AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SP1-1	SE147094.033	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
SP1-2	SE147094.034	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN400/AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101_0.0-0.1	SE147094.001	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH101_0.4-0.5	SE147094.002	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH102_0.0-0.1	SE147094.003	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH103_0.0-0.1	SE147094.004	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH104M_0.4-0.5	SE147094.006	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH105_0.0-0.1	SE147094.007	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH106M_0.6-0.7	SE147094.009	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH106M_0.9-1.0	SE147094.010	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH107_0.2-0.3	SE147094.011	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH108_0.2-0.3	SE147094.012	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH109_0.2-0.3	SE147094.013	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH109_0.7-0.8	SE147094.014	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH110_0.3-0.4	SE147094.015	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH111_0.2-0.3	SE147094.016	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH111_1.1-1.2	SE147094.017	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH112_0.2-0.3	SE147094.018	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH113_0.2-0.3	SE147094.019	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH114_0.2-0.3	SE147094.020	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH114_1.0-1.1	SE147094.021	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH115_0.2-0.3	SE147094.022	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH115_0.5-0.6	SE147094.023	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH116_0.2-0.3	SE147094.024	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015
BH117_0.0-0.1	SE147094.025	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015
BH117M_1.0-1.1	SE147094.026	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH118_0.4-0.8	SE147094.028	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015
BH119_0.0-0.1	SE147094.029	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015
QD-01	SE147094.030	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
SP1-1	SE147094.033	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015
SP1-2	SE147094.034	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101_0.0-0.1	SE147094.001	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH101_0.4-0.5	SE147094.002	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH102_0.0-0.1	SE147094.003	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH103_0.0-0.1	SE147094.004	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH104M_0.4-0.5	SE147094.006	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH105_0.0-0.1	SE147094.007	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH106M_0.6-0.7	SE147094.009	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH106M_0.9-1.0	SE147094.010	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH107_0.2-0.3	SE147094.011	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH108_0.2-0.3	SE147094.012	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH109_0.2-0.3	SE147094.013	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH109_0.7-0.8	SE147094.014	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH110_0.3-0.4	SE147094.015	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH111_0.2-0.3	SE147094.016	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH111_1.1-1.2	SE147094.017	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH112_0.2-0.3	SE147094.018	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH113_0.2-0.3	SE147094.019	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH114_0.2-0.3	SE147094.020	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH114_1.0-1.1	SE147094.021	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH115_0.2-0.3	SE147094.022	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH115_0.5-0.6	SE147094.023	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015
BH116_0.2-0.3	SE147094.024	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015
BH117_0.0-0.1	SE147094.025	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015
BH117M_1.0-1.1	SE147094.026	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015

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 sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH118_0.4-0.8	SE147094.028	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015
BH119_0.0-0.1	SE147094.029	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015
QD-01	SE147094.030	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
SP1-1	SE147094.033	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015
SP1-2	SE147094.034	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015

PCBs in Soil

Method: ME-(AU)-[ENV]AN400/AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101_0.0-0.1	SE147094.001	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH101_0.4-0.5	SE147094.002	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH102_0.0-0.1	SE147094.003	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH103_0.0-0.1	SE147094.004	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH104M_0.4-0.5	SE147094.006	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH105_0.0-0.1	SE147094.007	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH106M_0.6-0.7	SE147094.009	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH106M_0.9-1.0	SE147094.010	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH107_0.2-0.3	SE147094.011	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH108_0.2-0.3	SE147094.012	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH109_0.2-0.3	SE147094.013	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH109_0.7-0.8	SE147094.014	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH110_0.3-0.4	SE147094.015	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH111_0.2-0.3	SE147094.016	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH111_1.1-1.2	SE147094.017	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH112_0.2-0.3	SE147094.018	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH113_0.2-0.3	SE147094.019	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH114_0.2-0.3	SE147094.020	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH114_1.0-1.1	SE147094.021	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH115_0.2-0.3	SE147094.022	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH115_0.5-0.6	SE147094.023	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH116_0.2-0.3	SE147094.024	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH117_0.0-0.1	SE147094.025	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH117M_1.0-1.1	SE147094.026	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH118_0.4-0.8	SE147094.028	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
BH119_0.0-0.1	SE147094.029	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
QD-01	SE147094.030	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
SP1-1	SE147094.033	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015
SP1-2	SE147094.034	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015

Total Recoverable Metals in Soil by ICPOES

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101_0.0-0.1	SE147094.001	LB091836	10 Dec 2015	11 Dec 2015	07 Jun 2016	15 Dec 2015	07 Jun 2016	17 Dec 2015
BH101_0.4-0.5	SE147094.002	LB091836	10 Dec 2015	11 Dec 2015	07 Jun 2016	15 Dec 2015	07 Jun 2016	17 Dec 2015
BH102_0.0-0.1	SE147094.003	LB091836	10 Dec 2015	11 Dec 2015	07 Jun 2016	15 Dec 2015	07 Jun 2016	17 Dec 2015
BH103_0.0-0.1	SE147094.004	LB091836	10 Dec 2015	11 Dec 2015	07 Jun 2016	15 Dec 2015	07 Jun 2016	17 Dec 2015
BH104M_0.4-0.5	SE147094.006	LB091836	10 Dec 2015	11 Dec 2015	07 Jun 2016	15 Dec 2015	07 Jun 2016	17 Dec 2015
BH105_0.0-0.1	SE147094.007	LB091836	10 Dec 2015	11 Dec 2015	07 Jun 2016	15 Dec 2015	07 Jun 2016	17 Dec 2015
BH106M_0.6-0.7	SE147094.009	LB091836	10 Dec 2015	11 Dec 2015	07 Jun 2016	15 Dec 2015	07 Jun 2016	17 Dec 2015
BH106M_0.9-1.0	SE147094.010	LB091836	10 Dec 2015	11 Dec 2015	07 Jun 2016	15 Dec 2015	07 Jun 2016	17 Dec 2015
BH107_0.2-0.3	SE147094.011	LB091836	10 Dec 2015	11 Dec 2015	07 Jun 2016	15 Dec 2015	07 Jun 2016	17 Dec 2015
BH108_0.2-0.3	SE147094.012	LB091836	10 Dec 2015	11 Dec 2015	07 Jun 2016	15 Dec 2015	07 Jun 2016	17 Dec 2015
BH109_0.2-0.3	SE147094.013	LB091836	10 Dec 2015	11 Dec 2015	07 Jun 2016	15 Dec 2015	07 Jun 2016	17 Dec 2015
BH109_0.7-0.8	SE147094.014	LB091836	10 Dec 2015	11 Dec 2015	07 Jun 2016	15 Dec 2015	07 Jun 2016	17 Dec 2015
BH110_0.3-0.4	SE147094.015	LB091836	10 Dec 2015	11 Dec 2015	07 Jun 2016	15 Dec 2015	07 Jun 2016	17 Dec 2015
BH111_0.2-0.3	SE147094.016	LB091836	10 Dec 2015	11 Dec 2015	07 Jun 2016	15 Dec 2015	07 Jun 2016	17 Dec 2015
BH111_1.1-1.2	SE147094.017	LB091836	10 Dec 2015	11 Dec 2015	07 Jun 2016	15 Dec 2015	07 Jun 2016	17 Dec 2015
BH112_0.2-0.3	SE147094.018	LB091836	10 Dec 2015	11 Dec 2015	07 Jun 2016	15 Dec 2015	07 Jun 2016	17 Dec 2015
BH113_0.2-0.3	SE147094.019	LB091837	10 Dec 2015	11 Dec 2015	07 Jun 2016	15 Dec 2015	07 Jun 2016	17 Dec 2015
BH114_0.2-0.3	SE147094.020	LB091837	10 Dec 2015	11 Dec 2015	07 Jun 2016	15 Dec 2015	07 Jun 2016	17 Dec 2015
BH114_1.0-1.1	SE147094.021	LB091837	10 Dec 2015	11 Dec 2015	07 Jun 2016	15 Dec 2015	07 Jun 2016	17 Dec 2015
BH115_0.2-0.3	SE147094.022	LB091837	10 Dec 2015	11 Dec 2015	07 Jun 2016	15 Dec 2015	07 Jun 2016	17 Dec 2015
BH115_0.5-0.6	SE147094.023	LB091837	10 Dec 2015	11 Dec 2015	07 Jun 2016	15 Dec 2015	07 Jun 2016	17 Dec 2015

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 sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Total Recoverable Metals in Soil by ICPOES (continued)

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH116_0.2-0.3	SE147094.024	LB091837	10 Dec 2015	11 Dec 2015	07 Jun 2016	15 Dec 2015	07 Jun 2016	17 Dec 2015
BH117_0.0-0.1	SE147094.025	LB091837	10 Dec 2015	11 Dec 2015	07 Jun 2016	15 Dec 2015	07 Jun 2016	17 Dec 2015
BH117M_1.0-1.1	SE147094.026	LB091837	10 Dec 2015	11 Dec 2015	07 Jun 2016	15 Dec 2015	07 Jun 2016	17 Dec 2015
BH118_0.4-0.8	SE147094.028	LB091837	10 Dec 2015	11 Dec 2015	07 Jun 2016	15 Dec 2015	07 Jun 2016	17 Dec 2015
BH119_0.0-0.1	SE147094.029	LB091837	10 Dec 2015	11 Dec 2015	07 Jun 2016	15 Dec 2015	07 Jun 2016	17 Dec 2015
QD-01	SE147094.030	LB091837	10 Dec 2015	11 Dec 2015	07 Jun 2016	15 Dec 2015	07 Jun 2016	17 Dec 2015
SP1-1	SE147094.033	LB091837	10 Dec 2015	11 Dec 2015	07 Jun 2016	15 Dec 2015	07 Jun 2016	17 Dec 2015
SP1-2	SE147094.034	LB091837	10 Dec 2015	11 Dec 2015	07 Jun 2016	15 Dec 2015	07 Jun 2016	17 Dec 2015

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
QR-01	SE147094.031	LB091699	10 Dec 2015	11 Dec 2015	07 Jun 2016	14 Dec 2015	07 Jun 2016	15 Dec 2015

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101_0.0-0.1	SE147094.001	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH101_0.4-0.5	SE147094.002	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH102_0.0-0.1	SE147094.003	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH103_0.0-0.1	SE147094.004	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH104M_0.4-0.5	SE147094.006	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH105_0.0-0.1	SE147094.007	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH106M_0.6-0.7	SE147094.009	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH106M_0.9-1.0	SE147094.010	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH107_0.2-0.3	SE147094.011	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH108_0.2-0.3	SE147094.012	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH109_0.2-0.3	SE147094.013	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH109_0.7-0.8	SE147094.014	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH110_0.3-0.4	SE147094.015	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH111_0.2-0.3	SE147094.016	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH111_1.1-1.2	SE147094.017	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH112_0.2-0.3	SE147094.018	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH113_0.2-0.3	SE147094.019	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH114_0.2-0.3	SE147094.020	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH114_1.0-1.1	SE147094.021	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH115_0.2-0.3	SE147094.022	LB091730	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
BH115_0.5-0.6	SE147094.023	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015
BH116_0.2-0.3	SE147094.024	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015
BH117_0.0-0.1	SE147094.025	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015
BH117M_1.0-1.1	SE147094.026	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015
BH118_0.4-0.8	SE147094.028	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015
BH119_0.0-0.1	SE147094.029	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015
QD-01	SE147094.030	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015
SP1-1	SE147094.033	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015
SP1-2	SE147094.034	LB091732	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015

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
QR-01	SE147094.031	LB091733	10 Dec 2015	11 Dec 2015	17 Dec 2015	14 Dec 2015	23 Jan 2016	18 Dec 2015

VOC's in Soil

Method: ME-(AU)-[ENV]AN433/AN434

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101_0.0-0.1	SE147094.001	LB091692	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	15 Dec 2015
BH101_0.4-0.5	SE147094.002	LB091692	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	15 Dec 2015
BH102_0.0-0.1	SE147094.003	LB091692	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	15 Dec 2015
BH103_0.0-0.1	SE147094.004	LB091692	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	15 Dec 2015
BH104M_0.4-0.5	SE147094.006	LB091692	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	15 Dec 2015
BH105_0.0-0.1	SE147094.007	LB091692	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	15 Dec 2015
BH106M_0.6-0.7	SE147094.009	LB091692	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	15 Dec 2015
BH106M_0.9-1.0	SE147094.010	LB091692	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	15 Dec 2015
BH107_0.2-0.3	SE147094.011	LB091692	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	15 Dec 2015

HOLDING TIME SUMMARY

SE147094 R0

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

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

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

VOC's in Soil (continued)

Method: ME-(AU)-[ENV]AN433/AN434

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH108_0.2-0.3	SE147094.012	LB091692	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	15 Dec 2015
BH109_0.2-0.3	SE147094.013	LB091692	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	15 Dec 2015
BH109_0.7-0.8	SE147094.014	LB091692	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	15 Dec 2015
BH110_0.3-0.4	SE147094.015	LB091692	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	15 Dec 2015
BH111_0.2-0.3	SE147094.016	LB091692	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	15 Dec 2015
BH111_1.1-1.2	SE147094.017	LB091692	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	15 Dec 2015
BH112_0.2-0.3	SE147094.018	LB091692	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	15 Dec 2015
BH113_0.2-0.3	SE147094.019	LB091692	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	15 Dec 2015
BH114_0.2-0.3	SE147094.020	LB091692	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	15 Dec 2015
BH114_1.0-1.1	SE147094.021	LB091692	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	15 Dec 2015
BH115_0.2-0.3	SE147094.022	LB091693	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015
BH115_0.5-0.6	SE147094.023	LB091693	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015
BH116_0.2-0.3	SE147094.024	LB091693	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015
BH117_0.0-0.1	SE147094.025	LB091693	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015
BH117M_1.0-1.1	SE147094.026	LB091693	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015
BH118_0.4-0.8	SE147094.028	LB091693	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015
BH119_0.0-0.1	SE147094.029	LB091693	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015
QD-01	SE147094.030	LB091693	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015
Trip Blank	SE147094.032	LB091693	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015
SP1-1	SE147094.033	LB091693	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015
SP1-2	SE147094.034	LB091693	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015

VOCs in Water

Method: ME-(AU)-[ENV]AN433/AN434

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QR-01	SE147094.031	LB091916	10 Dec 2015	11 Dec 2015	17 Dec 2015	16 Dec 2015	25 Jan 2016	17 Dec 2015

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433/AN434/AN410

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101_0.0-0.1	SE147094.001	LB091692	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	15 Dec 2015
BH101_0.4-0.5	SE147094.002	LB091692	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	15 Dec 2015
BH102_0.0-0.1	SE147094.003	LB091692	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	15 Dec 2015
BH103_0.0-0.1	SE147094.004	LB091692	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	15 Dec 2015
BH104M_0.4-0.5	SE147094.006	LB091692	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	15 Dec 2015
BH105_0.0-0.1	SE147094.007	LB091692	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	15 Dec 2015
BH106M_0.6-0.7	SE147094.009	LB091692	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	15 Dec 2015
BH106M_0.9-1.0	SE147094.010	LB091692	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	15 Dec 2015
BH107_0.2-0.3	SE147094.011	LB091692	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	15 Dec 2015
BH108_0.2-0.3	SE147094.012	LB091692	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	15 Dec 2015
BH109_0.2-0.3	SE147094.013	LB091692	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	15 Dec 2015
BH109_0.7-0.8	SE147094.014	LB091692	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	15 Dec 2015
BH110_0.3-0.4	SE147094.015	LB091692	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	15 Dec 2015
BH111_0.2-0.3	SE147094.016	LB091692	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	15 Dec 2015
BH111_1.1-1.2	SE147094.017	LB091692	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	15 Dec 2015
BH112_0.2-0.3	SE147094.018	LB091692	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	15 Dec 2015
BH113_0.2-0.3	SE147094.019	LB091692	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	15 Dec 2015
BH114_0.2-0.3	SE147094.020	LB091692	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	15 Dec 2015
BH114_1.0-1.1	SE147094.021	LB091692	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	15 Dec 2015
BH115_0.2-0.3	SE147094.022	LB091693	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015
BH115_0.5-0.6	SE147094.023	LB091693	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015
BH116_0.2-0.3	SE147094.024	LB091693	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015
BH117_0.0-0.1	SE147094.025	LB091693	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015
BH117M_1.0-1.1	SE147094.026	LB091693	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015
BH118_0.4-0.8	SE147094.028	LB091693	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015
BH119_0.0-0.1	SE147094.029	LB091693	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015
QD-01	SE147094.030	LB091693	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015
Trip Blank	SE147094.032	LB091693	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	17 Dec 2015
SP1-1	SE147094.033	LB091693	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015
SP1-2	SE147094.034	LB091693	10 Dec 2015	11 Dec 2015	24 Dec 2015	14 Dec 2015	23 Jan 2016	16 Dec 2015

HOLDING TIME SUMMARY

SE147094 R0

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

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

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433/AN434/AN410

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QR-01	SE147094.031	LB091916	10 Dec 2015	11 Dec 2015	17 Dec 2015	16 Dec 2015	25 Jan 2016	17 Dec 2015

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

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

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN400/AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	BH101_0.0-0.1	SE147094.001	%	60 - 130%	109
	BH102_0.0-0.1	SE147094.003	%	60 - 130%	101
	BH103_0.0-0.1	SE147094.004	%	60 - 130%	106
	BH104M_0.4-0.5	SE147094.006	%	60 - 130%	96
	BH105_0.0-0.1	SE147094.007	%	60 - 130%	113
	BH106M_0.6-0.7	SE147094.009	%	60 - 130%	100
	BH107_0.2-0.3	SE147094.011	%	60 - 130%	106
	BH108_0.2-0.3	SE147094.012	%	60 - 130%	107
	BH109_0.2-0.3	SE147094.013	%	60 - 130%	98
	BH110_0.3-0.4	SE147094.015	%	60 - 130%	109
	BH111_0.2-0.3	SE147094.016	%	60 - 130%	103
	BH112_0.2-0.3	SE147094.018	%	60 - 130%	106
	BH113_0.2-0.3	SE147094.019	%	60 - 130%	93
	BH114_0.2-0.3	SE147094.020	%	60 - 130%	115
	BH115_0.2-0.3	SE147094.022	%	60 - 130%	99
	BH116_0.2-0.3	SE147094.024	%	60 - 130%	102
	BH117_0.0-0.1	SE147094.025	%	60 - 130%	108
	BH118_0.4-0.8	SE147094.028	%	60 - 130%	108
	BH119_0.0-0.1	SE147094.029	%	60 - 130%	100
	SP1-1	SE147094.033	%	60 - 130%	97
	SP1-2	SE147094.034	%	60 - 130%	102

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN400/AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	BH101_0.0-0.1	SE147094.001	%	60 - 130%	80
	BH102_0.0-0.1	SE147094.003	%	60 - 130%	76
	BH103_0.0-0.1	SE147094.004	%	60 - 130%	86
	BH104M_0.4-0.5	SE147094.006	%	60 - 130%	82
	BH105_0.0-0.1	SE147094.007	%	60 - 130%	86
	BH106M_0.6-0.7	SE147094.009	%	60 - 130%	88
	BH107_0.2-0.3	SE147094.011	%	60 - 130%	82
	BH108_0.2-0.3	SE147094.012	%	60 - 130%	78
	BH109_0.2-0.3	SE147094.013	%	60 - 130%	80
	BH110_0.3-0.4	SE147094.015	%	60 - 130%	86
	BH111_0.2-0.3	SE147094.016	%	60 - 130%	78
	BH112_0.2-0.3	SE147094.018	%	60 - 130%	80
	BH113_0.2-0.3	SE147094.019	%	60 - 130%	84
	BH114_0.2-0.3	SE147094.020	%	60 - 130%	84
	BH115_0.2-0.3	SE147094.022	%	60 - 130%	80
	BH116_0.2-0.3	SE147094.024	%	60 - 130%	84
	BH117_0.0-0.1	SE147094.025	%	60 - 130%	80
	BH118_0.4-0.8	SE147094.028	%	60 - 130%	76
	BH119_0.0-0.1	SE147094.029	%	60 - 130%	104
	SP1-1	SE147094.033	%	60 - 130%	100
	SP1-2	SE147094.034	%	60 - 130%	96
d14-p-terphenyl (Surrogate)	BH101_0.0-0.1	SE147094.001	%	60 - 130%	96
	BH102_0.0-0.1	SE147094.003	%	60 - 130%	80
	BH103_0.0-0.1	SE147094.004	%	60 - 130%	110
	BH104M_0.4-0.5	SE147094.006	%	60 - 130%	104
	BH105_0.0-0.1	SE147094.007	%	60 - 130%	110
	BH106M_0.6-0.7	SE147094.009	%	60 - 130%	100
	BH107_0.2-0.3	SE147094.011	%	60 - 130%	108
	BH108_0.2-0.3	SE147094.012	%	60 - 130%	86
	BH109_0.2-0.3	SE147094.013	%	60 - 130%	104
	BH110_0.3-0.4	SE147094.015	%	60 - 130%	100
	BH111_0.2-0.3	SE147094.016	%	60 - 130%	106
	BH112_0.2-0.3	SE147094.018	%	60 - 130%	90
	BH113_0.2-0.3	SE147094.019	%	60 - 130%	110
	BH114_0.2-0.3	SE147094.020	%	60 - 130%	100
	BH115_0.2-0.3	SE147094.022	%	60 - 130%	100
	BH116_0.2-0.3	SE147094.024	%	60 - 130%	114

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

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

OP Pesticides in Soil (continued)

Method: ME-(AU)-[ENV]AN400/AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
d14-p-terphenyl (Surrogate)	BH117_0.0-0.1	SE147094.025	%	60 - 130%	108
	BH118_0.4-0.8	SE147094.028	%	60 - 130%	110
	BH119_0.0-0.1	SE147094.029	%	60 - 130%	110
	SP1-1	SE147094.033	%	60 - 130%	114
	SP1-2	SE147094.034	%	60 - 130%	122

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	BH101_0.0-0.1	SE147094.001	%	70 - 130%	80
	BH101_0.4-0.5	SE147094.002	%	70 - 130%	94
	BH102_0.0-0.1	SE147094.003	%	70 - 130%	76
	BH103_0.0-0.1	SE147094.004	%	70 - 130%	86
	BH104M_0.4-0.5	SE147094.006	%	70 - 130%	82
	BH105_0.0-0.1	SE147094.007	%	70 - 130%	86
	BH106M_0.6-0.7	SE147094.009	%	70 - 130%	88
	BH106M_0.9-1.0	SE147094.010	%	70 - 130%	86
	BH107_0.2-0.3	SE147094.011	%	70 - 130%	82
	BH108_0.2-0.3	SE147094.012	%	70 - 130%	78
	BH109_0.2-0.3	SE147094.013	%	70 - 130%	80
	BH109_0.7-0.8	SE147094.014	%	70 - 130%	86
	BH110_0.3-0.4	SE147094.015	%	70 - 130%	86
	BH111_0.2-0.3	SE147094.016	%	70 - 130%	78
	BH111_1.1-1.2	SE147094.017	%	70 - 130%	84
	BH112_0.2-0.3	SE147094.018	%	70 - 130%	80
	BH113_0.2-0.3	SE147094.019	%	70 - 130%	84
	BH114_0.2-0.3	SE147094.020	%	70 - 130%	84
	BH114_1.0-1.1	SE147094.021	%	70 - 130%	90
	BH115_0.2-0.3	SE147094.022	%	70 - 130%	80
	BH115_0.5-0.6	SE147094.023	%	70 - 130%	74
	BH116_0.2-0.3	SE147094.024	%	70 - 130%	84
	BH117_0.0-0.1	SE147094.025	%	70 - 130%	80
	BH117M_1.0-1.1	SE147094.026	%	70 - 130%	78
	BH118_0.4-0.8	SE147094.028	%	70 - 130%	76
	BH119_0.0-0.1	SE147094.029	%	70 - 130%	104
	SP1-1	SE147094.033	%	70 - 130%	100
	SP1-2	SE147094.034	%	70 - 130%	96
d14-p-terphenyl (Surrogate)	BH101_0.0-0.1	SE147094.001	%	70 - 130%	96
	BH101_0.4-0.5	SE147094.002	%	70 - 130%	106
	BH102_0.0-0.1	SE147094.003	%	70 - 130%	80
	BH103_0.0-0.1	SE147094.004	%	70 - 130%	110
	BH104M_0.4-0.5	SE147094.006	%	70 - 130%	104
	BH105_0.0-0.1	SE147094.007	%	70 - 130%	110
	BH106M_0.6-0.7	SE147094.009	%	70 - 130%	100
	BH106M_0.9-1.0	SE147094.010	%	70 - 130%	98
	BH107_0.2-0.3	SE147094.011	%	70 - 130%	108
	BH108_0.2-0.3	SE147094.012	%	70 - 130%	86
	BH109_0.2-0.3	SE147094.013	%	70 - 130%	104
	BH109_0.7-0.8	SE147094.014	%	70 - 130%	110
	BH110_0.3-0.4	SE147094.015	%	70 - 130%	100
	BH111_0.2-0.3	SE147094.016	%	70 - 130%	106
	BH111_1.1-1.2	SE147094.017	%	70 - 130%	106
	BH112_0.2-0.3	SE147094.018	%	70 - 130%	90
	BH113_0.2-0.3	SE147094.019	%	70 - 130%	110
	BH114_0.2-0.3	SE147094.020	%	70 - 130%	100
	BH114_1.0-1.1	SE147094.021	%	70 - 130%	102
	BH115_0.2-0.3	SE147094.022	%	70 - 130%	100
	BH115_0.5-0.6	SE147094.023	%	70 - 130%	104
	BH116_0.2-0.3	SE147094.024	%	70 - 130%	114
	BH117_0.0-0.1	SE147094.025	%	70 - 130%	108
	BH117M_1.0-1.1	SE147094.026	%	70 - 130%	120
	BH118_0.4-0.8	SE147094.028	%	70 - 130%	110

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

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

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
d14-p-terphenyl (Surrogate)	BH119_0.0-0.1	SE147094.029	%	70 - 130%	110
	SP1-1	SE147094.033	%	70 - 130%	114
	SP1-2	SE147094.034	%	70 - 130%	122
d5-nitrobenzene (Surrogate)	BH101_0.0-0.1	SE147094.001	%	70 - 130%	102
	BH101_0.4-0.5	SE147094.002	%	70 - 130%	94
	BH102_0.0-0.1	SE147094.003	%	70 - 130%	86
	BH103_0.0-0.1	SE147094.004	%	70 - 130%	116
	BH104M_0.4-0.5	SE147094.006	%	70 - 130%	108
	BH105_0.0-0.1	SE147094.007	%	70 - 130%	114
	BH106M_0.6-0.7	SE147094.009	%	70 - 130%	108
	BH106M_0.9-1.0	SE147094.010	%	70 - 130%	102
	BH107_0.2-0.3	SE147094.011	%	70 - 130%	102
	BH108_0.2-0.3	SE147094.012	%	70 - 130%	86
	BH109_0.2-0.3	SE147094.013	%	70 - 130%	108
	BH109_0.7-0.8	SE147094.014	%	70 - 130%	114
	BH110_0.3-0.4	SE147094.015	%	70 - 130%	102
	BH111_0.2-0.3	SE147094.016	%	70 - 130%	98
	BH111_1.1-1.2	SE147094.017	%	70 - 130%	98
	BH112_0.2-0.3	SE147094.018	%	70 - 130%	84
	BH113_0.2-0.3	SE147094.019	%	70 - 130%	106
	BH114_0.2-0.3	SE147094.020	%	70 - 130%	96
	BH114_1.0-1.1	SE147094.021	%	70 - 130%	90
	BH115_0.2-0.3	SE147094.022	%	70 - 130%	84
	BH115_0.5-0.6	SE147094.023	%	70 - 130%	90
	BH116_0.2-0.3	SE147094.024	%	70 - 130%	98
	BH117_0.0-0.1	SE147094.025	%	70 - 130%	90
	BH117M_1.0-1.1	SE147094.026	%	70 - 130%	104
	BH118_0.4-0.8	SE147094.028	%	70 - 130%	94
	BH119_0.0-0.1	SE147094.029	%	70 - 130%	108
	SP1-1	SE147094.033	%	70 - 130%	118
	SP1-2	SE147094.034	%	70 - 130%	112

PCBs in Soil

Method: ME-(AU)-[ENV]AN400/AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	BH101_0.0-0.1	SE147094.001	%	60 - 130%	109
	BH102_0.0-0.1	SE147094.003	%	60 - 130%	101
	BH103_0.0-0.1	SE147094.004	%	60 - 130%	106
	BH104M_0.4-0.5	SE147094.006	%	60 - 130%	96
	BH105_0.0-0.1	SE147094.007	%	60 - 130%	113
	BH106M_0.6-0.7	SE147094.009	%	60 - 130%	100
	BH107_0.2-0.3	SE147094.011	%	60 - 130%	106
	BH108_0.2-0.3	SE147094.012	%	60 - 130%	107
	BH109_0.2-0.3	SE147094.013	%	60 - 130%	98
	BH110_0.3-0.4	SE147094.015	%	60 - 130%	109
	BH111_0.2-0.3	SE147094.016	%	60 - 130%	103
	BH112_0.2-0.3	SE147094.018	%	60 - 130%	106
	BH113_0.2-0.3	SE147094.019	%	60 - 130%	93
	BH114_0.2-0.3	SE147094.020	%	60 - 130%	115
	BH115_0.2-0.3	SE147094.022	%	60 - 130%	99
	BH116_0.2-0.3	SE147094.024	%	60 - 130%	102
	BH117_0.0-0.1	SE147094.025	%	60 - 130%	108
	BH118_0.4-0.8	SE147094.028	%	60 - 130%	108
	BH119_0.0-0.1	SE147094.029	%	60 - 130%	100
	SP1-1	SE147094.033	%	60 - 130%	97
	SP1-2	SE147094.034	%	60 - 130%	102

VOC's in Soil

Method: ME-(AU)-[ENV]AN433/AN434

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH101_0.0-0.1	SE147094.001	%	60 - 130%	87
	BH101_0.4-0.5	SE147094.002	%	60 - 130%	85
	BH102_0.0-0.1	SE147094.003	%	60 - 130%	92
	BH103_0.0-0.1	SE147094.004	%	60 - 130%	110

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

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

VOC's in Soil (continued) — **Method: ME-(AU)-[ENV]AN433/AN434**

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH104M_0.4-0.5	SE147094.006	%	60 - 130%	88
	BH105_0.0-0.1	SE147094.007	%	60 - 130%	90
	BH106M_0.6-0.7	SE147094.009	%	60 - 130%	81
	BH106M_0.9-1.0	SE147094.010	%	60 - 130%	90
	BH107_0.2-0.3	SE147094.011	%	60 - 130%	88
	BH108_0.2-0.3	SE147094.012	%	60 - 130%	103
	BH109_0.2-0.3	SE147094.013	%	60 - 130%	80
	BH109_0.7-0.8	SE147094.014	%	60 - 130%	89
	BH110_0.3-0.4	SE147094.015	%	60 - 130%	82
	BH111_0.2-0.3	SE147094.016	%	60 - 130%	78
	BH111_1.1-1.2	SE147094.017	%	60 - 130%	88
	BH112_0.2-0.3	SE147094.018	%	60 - 130%	77
	BH113_0.2-0.3	SE147094.019	%	60 - 130%	110
	BH114_0.2-0.3	SE147094.020	%	60 - 130%	90
	BH114_1.0-1.1	SE147094.021	%	60 - 130%	99
	BH115_0.2-0.3	SE147094.022	%	60 - 130%	94
	BH115_0.5-0.6	SE147094.023	%	60 - 130%	92
	BH116_0.2-0.3	SE147094.024	%	60 - 130%	89
	BH117_0.0-0.1	SE147094.025	%	60 - 130%	99
	BH117M_1.0-1.1	SE147094.026	%	60 - 130%	88
	BH118_0.4-0.8	SE147094.028	%	60 - 130%	88
	BH119_0.0-0.1	SE147094.029	%	60 - 130%	88
	QD-01	SE147094.030	%	60 - 130%	99
	Trip Blank	SE147094.032	%	60 - 130%	92
	SP1-1	SE147094.033	%	60 - 130%	100
	SP1-2	SE147094.034	%	60 - 130%	101
d4-1,2-dichloroethane (Surrogate)	BH101_0.0-0.1	SE147094.001	%	60 - 130%	84
	BH101_0.4-0.5	SE147094.002	%	60 - 130%	80
	BH102_0.0-0.1	SE147094.003	%	60 - 130%	84
	BH103_0.0-0.1	SE147094.004	%	60 - 130%	85
	BH104M_0.4-0.5	SE147094.006	%	60 - 130%	88
	BH105_0.0-0.1	SE147094.007	%	60 - 130%	86
	BH106M_0.6-0.7	SE147094.009	%	60 - 130%	83
	BH106M_0.9-1.0	SE147094.010	%	60 - 130%	91
	BH107_0.2-0.3	SE147094.011	%	60 - 130%	92
	BH108_0.2-0.3	SE147094.012	%	60 - 130%	89
	BH109_0.2-0.3	SE147094.013	%	60 - 130%	87
	BH109_0.7-0.8	SE147094.014	%	60 - 130%	89
	BH110_0.3-0.4	SE147094.015	%	60 - 130%	84
	BH111_0.2-0.3	SE147094.016	%	60 - 130%	94
	BH111_1.1-1.2	SE147094.017	%	60 - 130%	90
	BH112_0.2-0.3	SE147094.018	%	60 - 130%	87
	BH113_0.2-0.3	SE147094.019	%	60 - 130%	99
	BH114_0.2-0.3	SE147094.020	%	60 - 130%	90
	BH114_1.0-1.1	SE147094.021	%	60 - 130%	88
	BH115_0.2-0.3	SE147094.022	%	60 - 130%	76
	BH115_0.5-0.6	SE147094.023	%	60 - 130%	93
	BH116_0.2-0.3	SE147094.024	%	60 - 130%	85
	BH117_0.0-0.1	SE147094.025	%	60 - 130%	86
	BH117M_1.0-1.1	SE147094.026	%	60 - 130%	100
	BH118_0.4-0.8	SE147094.028	%	60 - 130%	89
	BH119_0.0-0.1	SE147094.029	%	60 - 130%	89
	QD-01	SE147094.030	%	60 - 130%	80
	Trip Blank	SE147094.032	%	60 - 130%	89
	SP1-1	SE147094.033	%	60 - 130%	82
	SP1-2	SE147094.034	%	60 - 130%	104
d8-toluene (Surrogate)	BH101_0.0-0.1	SE147094.001	%	60 - 130%	112
	BH101_0.4-0.5	SE147094.002	%	60 - 130%	112
	BH102_0.0-0.1	SE147094.003	%	60 - 130%	116
	BH103_0.0-0.1	SE147094.004	%	60 - 130%	123
	BH104M_0.4-0.5	SE147094.006	%	60 - 130%	119

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

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

VOC's in Soil (continued)

Method: ME-(AU)-[ENV]AN433/AN434

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
d8-toluene (Surrogate)	BH105_0.0-0.1	SE147094.007	%	60 - 130%	112
	BH106M_0.6-0.7	SE147094.009	%	60 - 130%	112
	BH106M_0.9-1.0	SE147094.010	%	60 - 130%	118
	BH107_0.2-0.3	SE147094.011	%	60 - 130%	119
	BH108_0.2-0.3	SE147094.012	%	60 - 130%	116
	BH109_0.2-0.3	SE147094.013	%	60 - 130%	106
	BH109_0.7-0.8	SE147094.014	%	60 - 130%	128
	BH110_0.3-0.4	SE147094.015	%	60 - 130%	115
	BH111_0.2-0.3	SE147094.016	%	60 - 130%	118
	BH111_1.1-1.2	SE147094.017	%	60 - 130%	109
	BH112_0.2-0.3	SE147094.018	%	60 - 130%	113
	BH113_0.2-0.3	SE147094.019	%	60 - 130%	126
	BH114_0.2-0.3	SE147094.020	%	60 - 130%	112
	BH114_1.0-1.1	SE147094.021	%	60 - 130%	123
	BH115_0.2-0.3	SE147094.022	%	60 - 130%	75
	BH115_0.5-0.6	SE147094.023	%	60 - 130%	100
	BH116_0.2-0.3	SE147094.024	%	60 - 130%	91
	BH117_0.0-0.1	SE147094.025	%	60 - 130%	94
	BH117M_1.0-1.1	SE147094.026	%	60 - 130%	106
	BH118_0.4-0.8	SE147094.028	%	60 - 130%	93
	BH119_0.0-0.1	SE147094.029	%	60 - 130%	96
	QD-01	SE147094.030	%	60 - 130%	84
	Trip Blank	SE147094.032	%	60 - 130%	94
	SP1-1	SE147094.033	%	60 - 130%	87
	SP1-2	SE147094.034	%	60 - 130%	112
Dibromofluoromethane (Surrogate)	BH101_0.0-0.1	SE147094.001	%	60 - 130%	73
	BH101_0.4-0.5	SE147094.002	%	60 - 130%	71
	BH102_0.0-0.1	SE147094.003	%	60 - 130%	73
	BH103_0.0-0.1	SE147094.004	%	60 - 130%	75
	BH104M_0.4-0.5	SE147094.006	%	60 - 130%	75
	BH105_0.0-0.1	SE147094.007	%	60 - 130%	73
	BH106M_0.6-0.7	SE147094.009	%	60 - 130%	72
	BH106M_0.9-1.0	SE147094.010	%	60 - 130%	79
	BH107_0.2-0.3	SE147094.011	%	60 - 130%	78
	BH108_0.2-0.3	SE147094.012	%	60 - 130%	76
	BH109_0.2-0.3	SE147094.013	%	60 - 130%	73
	BH109_0.7-0.8	SE147094.014	%	60 - 130%	77
	BH110_0.3-0.4	SE147094.015	%	60 - 130%	71
	BH111_0.2-0.3	SE147094.016	%	60 - 130%	79
	BH111_1.1-1.2	SE147094.017	%	60 - 130%	74
	BH112_0.2-0.3	SE147094.018	%	60 - 130%	75
	BH113_0.2-0.3	SE147094.019	%	60 - 130%	83
	BH114_0.2-0.3	SE147094.020	%	60 - 130%	74
	BH114_1.0-1.1	SE147094.021	%	60 - 130%	72
	BH115_0.2-0.3	SE147094.022	%	60 - 130%	73
	BH115_0.5-0.6	SE147094.023	%	60 - 130%	80
	BH116_0.2-0.3	SE147094.024	%	60 - 130%	83
	BH117_0.0-0.1	SE147094.025	%	60 - 130%	74
	BH117M_1.0-1.1	SE147094.026	%	60 - 130%	79
	BH118_0.4-0.8	SE147094.028	%	60 - 130%	73
	BH119_0.0-0.1	SE147094.029	%	60 - 130%	77
	QD-01	SE147094.030	%	60 - 130%	77
	Trip Blank	SE147094.032	%	60 - 130%	77
	SP1-1	SE147094.033	%	60 - 130%	73
	SP1-2	SE147094.034	%	60 - 130%	80

VOCs in Water

Method: ME-(AU)-[ENV]AN433/AN434

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	QR-01	SE147094.031	%	40 - 130%	106
d4-1,2-dichloroethane (Surrogate)	QR-01	SE147094.031	%	40 - 130%	103
d8-toluene (Surrogate)	QR-01	SE147094.031	%	40 - 130%	95

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

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

VOCs in Water (continued)

Method: ME-(AU)-[ENV]AN433/AN434

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Dibromofluoromethane (Surrogate)	QR-01	SE147094.031	%	40 - 130%	114

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433/AN434/AN410

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH101_0.0-0.1	SE147094.001	%	60 - 130%	87
	BH101_0.4-0.5	SE147094.002	%	60 - 130%	85
	BH102_0.0-0.1	SE147094.003	%	60 - 130%	92
	BH103_0.0-0.1	SE147094.004	%	60 - 130%	110
	BH104M_0.4-0.5	SE147094.006	%	60 - 130%	88
	BH105_0.0-0.1	SE147094.007	%	60 - 130%	90
	BH106M_0.6-0.7	SE147094.009	%	60 - 130%	81
	BH106M_0.9-1.0	SE147094.010	%	60 - 130%	90
	BH107_0.2-0.3	SE147094.011	%	60 - 130%	88
	BH108_0.2-0.3	SE147094.012	%	60 - 130%	103
	BH109_0.2-0.3	SE147094.013	%	60 - 130%	80
	BH109_0.7-0.8	SE147094.014	%	60 - 130%	89
	BH110_0.3-0.4	SE147094.015	%	60 - 130%	82
	BH111_0.2-0.3	SE147094.016	%	60 - 130%	78
	BH111_1.1-1.2	SE147094.017	%	60 - 130%	88
	BH112_0.2-0.3	SE147094.018	%	60 - 130%	77
	BH113_0.2-0.3	SE147094.019	%	60 - 130%	110
	BH114_0.2-0.3	SE147094.020	%	60 - 130%	90
	BH114_1.0-1.1	SE147094.021	%	60 - 130%	99
	BH115_0.2-0.3	SE147094.022	%	60 - 130%	94
	BH115_0.5-0.6	SE147094.023	%	60 - 130%	92
	BH116_0.2-0.3	SE147094.024	%	60 - 130%	89
	BH117_0.0-0.1	SE147094.025	%	60 - 130%	99
	BH117M_1.0-1.1	SE147094.026	%	60 - 130%	88
	BH118_0.4-0.8	SE147094.028	%	60 - 130%	88
	BH119_0.0-0.1	SE147094.029	%	60 - 130%	88
	QD-01	SE147094.030	%	60 - 130%	99
	SP1-1	SE147094.033	%	60 - 130%	100
	SP1-2	SE147094.034	%	60 - 130%	101
d4-1,2-dichloroethane (Surrogate)	BH101_0.0-0.1	SE147094.001	%	60 - 130%	84
	BH101_0.4-0.5	SE147094.002	%	60 - 130%	80
	BH102_0.0-0.1	SE147094.003	%	60 - 130%	84
	BH103_0.0-0.1	SE147094.004	%	60 - 130%	85
	BH104M_0.4-0.5	SE147094.006	%	60 - 130%	88
	BH105_0.0-0.1	SE147094.007	%	60 - 130%	86
	BH106M_0.6-0.7	SE147094.009	%	60 - 130%	83
	BH106M_0.9-1.0	SE147094.010	%	60 - 130%	91
	BH107_0.2-0.3	SE147094.011	%	60 - 130%	92
	BH108_0.2-0.3	SE147094.012	%	60 - 130%	89
	BH109_0.2-0.3	SE147094.013	%	60 - 130%	87
	BH109_0.7-0.8	SE147094.014	%	60 - 130%	89
	BH110_0.3-0.4	SE147094.015	%	60 - 130%	84
	BH111_0.2-0.3	SE147094.016	%	60 - 130%	94
	BH111_1.1-1.2	SE147094.017	%	60 - 130%	90
	BH112_0.2-0.3	SE147094.018	%	60 - 130%	87
	BH113_0.2-0.3	SE147094.019	%	60 - 130%	99
	BH114_0.2-0.3	SE147094.020	%	60 - 130%	90
	BH114_1.0-1.1	SE147094.021	%	60 - 130%	88
	BH115_0.2-0.3	SE147094.022	%	60 - 130%	76
	BH115_0.5-0.6	SE147094.023	%	60 - 130%	93
	BH116_0.2-0.3	SE147094.024	%	60 - 130%	85
	BH117_0.0-0.1	SE147094.025	%	60 - 130%	86
	BH117M_1.0-1.1	SE147094.026	%	60 - 130%	100
	BH118_0.4-0.8	SE147094.028	%	60 - 130%	89
	BH119_0.0-0.1	SE147094.029	%	60 - 130%	89
	QD-01	SE147094.030	%	60 - 130%	80
	SP1-1	SE147094.033	%	60 - 130%	82

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

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

Volatile Petroleum Hydrocarbons in Soil (continued) — **Method: ME-(AU)-[ENV]AN433/AN434/AN410**

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
d4-1,2-dichloroethane (Surrogate)	SP1-2	SE147094.034	%	60 - 130%	104
d8-toluene (Surrogate)	BH101_0.0-0.1	SE147094.001	%	60 - 130%	112
	BH101_0.4-0.5	SE147094.002	%	60 - 130%	112
	BH102_0.0-0.1	SE147094.003	%	60 - 130%	116
	BH103_0.0-0.1	SE147094.004	%	60 - 130%	123
	BH104M_0.4-0.5	SE147094.006	%	60 - 130%	119
	BH105_0.0-0.1	SE147094.007	%	60 - 130%	112
	BH106M_0.6-0.7	SE147094.009	%	60 - 130%	112
	BH106M_0.9-1.0	SE147094.010	%	60 - 130%	118
	BH107_0.2-0.3	SE147094.011	%	60 - 130%	119
	BH108_0.2-0.3	SE147094.012	%	60 - 130%	116
	BH109_0.2-0.3	SE147094.013	%	60 - 130%	106
	BH109_0.7-0.8	SE147094.014	%	60 - 130%	128
	BH110_0.3-0.4	SE147094.015	%	60 - 130%	115
	BH111_0.2-0.3	SE147094.016	%	60 - 130%	118
	BH111_1.1-1.2	SE147094.017	%	60 - 130%	109
	BH112_0.2-0.3	SE147094.018	%	60 - 130%	113
	BH113_0.2-0.3	SE147094.019	%	60 - 130%	126
	BH114_0.2-0.3	SE147094.020	%	60 - 130%	112
	BH114_1.0-1.1	SE147094.021	%	60 - 130%	123
	BH115_0.2-0.3	SE147094.022	%	60 - 130%	75
	BH115_0.5-0.6	SE147094.023	%	60 - 130%	100
	BH116_0.2-0.3	SE147094.024	%	60 - 130%	91
	BH117_0.0-0.1	SE147094.025	%	60 - 130%	94
	BH117M_1.0-1.1	SE147094.026	%	60 - 130%	106
	BH118_0.4-0.8	SE147094.028	%	60 - 130%	93
	BH119_0.0-0.1	SE147094.029	%	60 - 130%	96
	QD-01	SE147094.030	%	60 - 130%	84
	SP1-1	SE147094.033	%	60 - 130%	87
	SP1-2	SE147094.034	%	60 - 130%	112
Dibromofluoromethane (Surrogate)	BH101_0.0-0.1	SE147094.001	%	60 - 130%	73
	BH101_0.4-0.5	SE147094.002	%	60 - 130%	71
	BH102_0.0-0.1	SE147094.003	%	60 - 130%	73
	BH103_0.0-0.1	SE147094.004	%	60 - 130%	75
	BH104M_0.4-0.5	SE147094.006	%	60 - 130%	75
	BH105_0.0-0.1	SE147094.007	%	60 - 130%	73
	BH106M_0.6-0.7	SE147094.009	%	60 - 130%	72
	BH106M_0.9-1.0	SE147094.010	%	60 - 130%	79
	BH107_0.2-0.3	SE147094.011	%	60 - 130%	78
	BH108_0.2-0.3	SE147094.012	%	60 - 130%	76
	BH109_0.2-0.3	SE147094.013	%	60 - 130%	73
	BH109_0.7-0.8	SE147094.014	%	60 - 130%	77
	BH110_0.3-0.4	SE147094.015	%	60 - 130%	71
	BH111_0.2-0.3	SE147094.016	%	60 - 130%	79
	BH111_1.1-1.2	SE147094.017	%	60 - 130%	74
	BH112_0.2-0.3	SE147094.018	%	60 - 130%	75
	BH113_0.2-0.3	SE147094.019	%	60 - 130%	83
	BH114_0.2-0.3	SE147094.020	%	60 - 130%	74
	BH114_1.0-1.1	SE147094.021	%	60 - 130%	72
	BH115_0.2-0.3	SE147094.022	%	60 - 130%	73
	BH115_0.5-0.6	SE147094.023	%	60 - 130%	80
	BH116_0.2-0.3	SE147094.024	%	60 - 130%	83
	BH117_0.0-0.1	SE147094.025	%	60 - 130%	74
	BH117M_1.0-1.1	SE147094.026	%	60 - 130%	79
	BH118_0.4-0.8	SE147094.028	%	60 - 130%	73
	BH119_0.0-0.1	SE147094.029	%	60 - 130%	77
	QD-01	SE147094.030	%	60 - 130%	77
	SP1-1	SE147094.033	%	60 - 130%	73
	SP1-2	SE147094.034	%	60 - 130%	80

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

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

Volatile Petroleum Hydrocarbons in Water — **Method: ME-(AU)-[ENV]AN433/AN434/AN410**

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	QR-01	SE147094.031	%	40 - 130%	106
d4-1,2-dichloroethane (Surrogate)	QR-01	SE147094.031	%	60 - 130%	103
d8-toluene (Surrogate)	QR-01	SE147094.031	%	40 - 130%	95
Dibromofluoromethane (Surrogate)	QR-01	SE147094.031	%	40 - 130%	114

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/AN312

Sample Number	Parameter	Units	LOR	Result
LB091971.001	Mercury	mg/L	0.0001	<0.0001

Mercury in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB091900.001	Mercury	mg/kg	0.01	<0.01
LB091901.001	Mercury	mg/kg	0.01	<0.01

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN400/AN420

Sample Number		Parameter	Units	LOR	Result
LB091730.001		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)	%	-	101
LB091732.001		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)	%	-	130

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.

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN400/AN420

Sample Number		Parameter	Units	LOR	Result
LB091730.001		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)	%	-	82
		d14-p-terphenyl (Surrogate)	%	-	106
LB091732.001		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)	%	-	100
		d14-p-terphenyl (Surrogate)	%	-	116

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB091730.001		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
		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(a&h)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)	%	-	94
		2-fluorobiphenyl (Surrogate)	%	-	82
		d14-p-terphenyl (Surrogate)	%	-	106
LB091732.001		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
		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

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
LB091732.001		Benzo(a)pyrene	mg/kg	0.1	<0.1
		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
		Dibenzo(a&h)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)	%	-	102
		2-fluorobiphenyl (Surrogate)	%	-	100
		d14-p-terphenyl (Surrogate)	%	-	116

PCBs in Soil

Method: ME-(AU)-[ENV]AN400/AN420

Sample Number		Parameter	Units	LOR	Result
LB091730.001		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)	%	-	101
LB091732.001		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)	%	-	130

Total Recoverable Metals in Soil by ICPOES

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

Sample Number	Parameter	Units	LOR	Result
LB091836.001	Arsenic, As	mg/kg	3	<3
	Cadmium, Cd	mg/kg	0.3	<0.3
	Chromium, Cr	mg/kg	0.3	<0.3
	Copper, Cu	mg/kg	0.5	<0.5
	Lead, Pb	mg/kg	1	<1
	Nickel, Ni	mg/kg	0.5	<0.5
	Zinc, Zn	mg/kg	0.5	<0.5
LB091837.001	Arsenic, As	mg/kg	3	<3
	Cadmium, Cd	mg/kg	0.3	<0.3
	Chromium, Cr	mg/kg	0.3	<0.3
	Copper, Cu	mg/kg	0.5	<0.5
	Lead, Pb	mg/kg	1	<1
	Nickel, Ni	mg/kg	0.5	<0.5
	Zinc, Zn	mg/kg	0.5	<0.5

Trace Metals (Dissolved) in Water by ICPMS

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

Sample Number	Parameter	Units	LOR	Result
LB091699.001	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

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.

TRH (Total Recoverable Hydrocarbons) in Soil (continued)

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

Sample Number	Parameter	Units	LOR	Result
LB091730.001	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
LB091732.001	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
LB091733.001	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/AN434

Sample Number		Parameter	Units	LOR	Result
LB091692.001	Monocyclic Aromatic	Benzene	mg/kg	0.1	<0.1
	Hydrocarbons	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	Dibromofluoromethane (Surrogate)	%	-	82
		d4-1,2-dichloroethane (Surrogate)	%	-	91
		d8-toluene (Surrogate)	%	-	115
		Bromofluorobenzene (Surrogate)	%	-	83
	Totals	Total BTEX*	mg/kg	0.6	<0.6
LB091693.001	Monocyclic Aromatic	Benzene	mg/kg	0.1	<0.1
	Hydrocarbons	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	Dibromofluoromethane (Surrogate)	%	-	81
		d4-1,2-dichloroethane (Surrogate)	%	-	91
		d8-toluene (Surrogate)	%	-	98
		Bromofluorobenzene (Surrogate)	%	-	97
	Totals	Total BTEX*	mg/kg	0.6	<0.6

VOCs in Water

Method: ME-(AU)-[ENV]AN433/AN434

Sample Number		Parameter	Units	LOR	Result
LB091916.001	Monocyclic Aromatic	Benzene	µg/L	0.5	<0.5
	Hydrocarbons	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	Dibromofluoromethane (Surrogate)	%	-	92
		d4-1,2-dichloroethane (Surrogate)	%	-	88
		d8-toluene (Surrogate)	%	-	85
		Bromofluorobenzene (Surrogate)	%	-	123

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433/AN434/AN410

Sample Number		Parameter	Units	LOR	Result
LB091692.001		TRH C6-C9	mg/kg	20	<20
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	82
		d4-1,2-dichloroethane (Surrogate)	%	-	91
		d8-toluene (Surrogate)	%	-	115
LB091693.001		TRH C6-C9	mg/kg	20	<20

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/AN434/AN410

Sample Number		Parameter	Units	LOR	Result
LB091693.001	Surrogates	Dibromofluoromethane (Surrogate)	%	-	81
		d4-1,2-dichloroethane (Surrogate)	%	-	91
		d8-toluene (Surrogate)	%	-	98

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433/AN434/AN410

Sample Number		Parameter	Units	LOR	Result
LB091916.001		TRH C6-C9	µg/L	40	<40
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	92
		d4-1,2-dichloroethane (Surrogate)	%	-	88
		d8-toluene (Surrogate)	%	-	85
		Bromofluorobenzene (Surrogate)	%	-	123

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

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

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

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

Mercury in Soil

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE147094.009	LB091900.014	Mercury	mg/kg	0.01	0.03	0.03	194	0
SE147094.018	LB091900.024	Mercury	mg/kg	0.01	<0.01	<0.01	200	0
SE147094.029	LB091901.014	Mercury	mg/kg	0.01	0.02	0.02	200	0
SE147101.009	LB091901.023	Mercury	mg/kg	0.01	0.01487444440	0.0142886597	200	0

Moisture Content

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE147094.012	LB091691.011	% Moisture	%w/w	0.5	16	16	36	2
SE147094.022	LB091691.022	% Moisture	%w/w	0.5	21	21	35	3
SE147094.034	LB091691.033	% Moisture	%w/w	0.5	3.8	3.7	56	2

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN400/AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE147094.015	LB091730.027		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	0	200	0
			Alpha BHC	mg/kg	0.1	<0.1	0	200	0
			Lindane	mg/kg	0.1	<0.1	0	200	0
			Heptachlor	mg/kg	0.1	<0.1	0	200	0
			Aldrin	mg/kg	0.1	<0.1	0	200	0
			Beta BHC	mg/kg	0.1	<0.1	0	200	0
			Delta BHC	mg/kg	0.1	<0.1	0	200	0
			Heptachlor epoxide	mg/kg	0.1	<0.1	0	200	0
			o,p'-DDE	mg/kg	0.1	<0.1	0	200	0
			Alpha Endosulfan	mg/kg	0.2	<0.2	0	200	0
			Gamma Chlordane	mg/kg	0.1	<0.1	0	200	0
			Alpha Chlordane	mg/kg	0.1	<0.1	0	200	0
			trans-Nonachlor	mg/kg	0.1	<0.1	0	200	0
			p,p'-DDE	mg/kg	0.1	<0.1	0	200	0
			Dieldrin	mg/kg	0.2	<0.2	0	200	0
			Endrin	mg/kg	0.2	<0.2	0	200	0
			o,p'-DDD	mg/kg	0.1	<0.1	0	200	0
			o,p'-DDT	mg/kg	0.1	<0.1	0	200	0
			Beta Endosulfan	mg/kg	0.2	<0.2	0	200	0
			p,p'-DDD	mg/kg	0.1	<0.1	0	200	0
			p,p'-DDT	mg/kg	0.1	<0.1	0	200	0
			Endosulfan sulphate	mg/kg	0.1	<0.1	0	200	0
			Endrin Aldehyde	mg/kg	0.1	<0.1	0	200	0
			Methoxychlor	mg/kg	0.1	<0.1	0	200	0
			Endrin Ketone	mg/kg	0.1	<0.1	0	200	0
			Isodrin	mg/kg	0.1	<0.1	0	200	0
			Mirex	mg/kg	0.1	<0.1	0	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.16	0.16	30	2
SE147094.022	LB091730.025		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

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

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

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

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

OC Pesticides in Soil (continued)

Method: ME-(AU)-[ENV]AN400/AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE147094.022	LB091730.025		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
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.15	0.19	30	24
SE147094.034	LB091732.025		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	0	200	0
			Alpha BHC	mg/kg	0.1	<0.1	0	200	0
			Lindane	mg/kg	0.1	<0.1	0	200	0
			Heptachlor	mg/kg	0.1	<0.1	0	200	0
			Aldrin	mg/kg	0.1	<0.1	0	200	0
			Beta BHC	mg/kg	0.1	<0.1	0	200	0
			Delta BHC	mg/kg	0.1	<0.1	0	200	0
			Heptachlor epoxide	mg/kg	0.1	<0.1	0	200	0
			o,p'-DDE	mg/kg	0.1	<0.1	0	200	0
			Alpha Endosulfan	mg/kg	0.2	<0.2	0	200	0
			Gamma Chlordane	mg/kg	0.1	<0.1	0	200	0
			Alpha Chlordane	mg/kg	0.1	<0.1	0	200	0
			trans-Nonachlor	mg/kg	0.1	<0.1	0	200	0
			p,p'-DDE	mg/kg	0.1	<0.1	0	200	0
			Dieldrin	mg/kg	0.2	<0.2	0	200	0
			Endrin	mg/kg	0.2	<0.2	0	200	0
			o,p'-DDD	mg/kg	0.1	<0.1	0	200	0
			o,p'-DDT	mg/kg	0.1	<0.1	0	200	0
			Beta Endosulfan	mg/kg	0.2	<0.2	0	200	0
			p,p'-DDD	mg/kg	0.1	<0.1	0	200	0
			p,p'-DDT	mg/kg	0.1	<0.1	0	200	0
			Endosulfan sulphate	mg/kg	0.1	<0.1	0	200	0
			Endrin Aldehyde	mg/kg	0.1	<0.1	0	200	0
			Methoxychlor	mg/kg	0.1	<0.1	0	200	0
			Endrin Ketone	mg/kg	0.1	<0.1	0	200	0
			Isodrin	mg/kg	0.1	<0.1	0	200	0
			Mirex	mg/kg	0.1	<0.1	0	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.15	0.153	30	0

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN400/AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE147094.015	LB091730.027		Dichlorvos	mg/kg	0.5	<0.5	0	200	0
			Dimethoate	mg/kg	0.5	<0.5	0	200	0
			Diazinon (Dimpylate)	mg/kg	0.5	<0.5	0.02	200	0
			Fenitrothion	mg/kg	0.2	<0.2	0	200	0
			Malathion	mg/kg	0.2	<0.2	0	200	0
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	0.01	200	0
			Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	0	200	0
			Bromophos Ethyl	mg/kg	0.2	<0.2	0	200	0
			Methidathion	mg/kg	0.5	<0.5	0	200	0
			Ethion	mg/kg	0.2	<0.2	0	200	0
			Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	0	200	0
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.42	30	2
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.46	30	8
SE147094.022	LB091730.025		Dichlorvos	mg/kg	0.5	<0.5	<0.5	200	0
			Dimethoate	mg/kg	0.5	<0.5	<0.5	200	0
			Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	200	0
			Fenitrothion	mg/kg	0.2	<0.2	<0.2	200	0
			Malathion	mg/kg	0.2	<0.2	<0.2	200	0
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	200	0
			Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	200	0
			Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	200	0
			Methidathion	mg/kg	0.5	<0.5	<0.5	200	0

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

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

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

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

OP Pesticides in Soil (continued)

Method: ME-(AU)-[ENV]AN400/AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE147094.022	LB091730.025		Ethion	mg/kg	0.2	<0.2	<0.2	200	0
			Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	200	0
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	3
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	6
SE147094.033	LB091732.023		Dichlorvos	mg/kg	0.5	<0.5	0	200	0
			Dimethoate	mg/kg	0.5	<0.5	0.04	200	0
			Diazinon (Dimpylate)	mg/kg	0.5	<0.5	0	200	0
			Fenitrothion	mg/kg	0.2	<0.2	0.08	200	0
			Malathion	mg/kg	0.2	<0.2	0.01	200	0
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	0.01	200	0
			Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	0	200	0
			Bromophos Ethyl	mg/kg	0.2	<0.2	0.02	200	0
			Methidathion	mg/kg	0.5	<0.5	0.01	200	0
			Ethion	mg/kg	0.2	<0.2	0.01	200	0
			Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	0.04	200	0
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	0
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.6	0.53	30	7

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE147094.015	LB091730.027		Naphthalene	mg/kg	0.1	<0.1	0	200	0
			2-methylnaphthalene	mg/kg	0.1	<0.1	0	200	0
			1-methylnaphthalene	mg/kg	0.1	<0.1	0	200	0
			Acenaphthylene	mg/kg	0.1	<0.1	0	200	0
			Acenaphthene	mg/kg	0.1	<0.1	0	200	0
			Fluorene	mg/kg	0.1	<0.1	0	200	0
			Phenanthrene	mg/kg	0.1	<0.1	0.01	200	0
			Anthracene	mg/kg	0.1	<0.1	0.01	200	0
			Fluoranthene	mg/kg	0.1	<0.1	0.01	200	0
			Pyrene	mg/kg	0.1	<0.1	0.01	200	0
			Benzo(a)anthracene	mg/kg	0.1	<0.1	0.01	200	0
			Chrysene	mg/kg	0.1	<0.1	0.01	200	0
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	0.01	200	0
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	0.01	200	0
			Benzo(a)pyrene	mg/kg	0.1	<0.1	0	200	0
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	0	200	0
			Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1	0	200	0
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	0	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=0*	TEQ (mg/kg)	0.2	<0.2	0	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR*	TEQ (mg/kg)	0.3	<0.3	0.242	134	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2*	TEQ (mg/kg)	0.2	<0.2	0.121	175	0
			Total PAH (18)	mg/kg	0.8	<0.8	0	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	30	2
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.42	30	2
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.46	30	8
SE147094.022	LB091730.025		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

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

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

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

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

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued) — **Method: ME-(AU)-[ENV]AN420**

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE147094.022	LB091730.025		Dibenzo(a&h)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*	TEQ (mg/kg)	0.2	<0.2	<0.2	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR*	TEQ (mg/kg)	0.3	<0.3	<0.3	134	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2*	TEQ (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	2
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	3
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	6
SE147094.033	LB091732.023		Naphthalene	mg/kg	0.1	<0.1	0.01	200	0
			2-methylnaphthalene	mg/kg	0.1	<0.1	0.02	200	0
			1-methylnaphthalene	mg/kg	0.1	<0.1	0.01	200	0
			Acenaphthylene	mg/kg	0.1	<0.1	0	200	0
			Acenaphthene	mg/kg	0.1	<0.1	0.02	200	0
			Fluorene	mg/kg	0.1	<0.1	0	200	0
			Phenanthrene	mg/kg	0.1	<0.1	0.03	200	0
			Anthracene	mg/kg	0.1	<0.1	0	200	0
			Fluoranthene	mg/kg	0.1	<0.1	0.02	200	0
			Pyrene	mg/kg	0.1	<0.1	0.02	200	0
			Benzo(a)anthracene	mg/kg	0.1	<0.1	0.05	200	0
			Chrysene	mg/kg	0.1	<0.1	0.03	200	0
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	0.05	200	0
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	0.03	200	0
			Benzo(a)pyrene	mg/kg	0.1	<0.1	0.01	200	0
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	0	200	0
			Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1	0	200	0
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	0.01	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=0*	TEQ (mg/kg)	0.2	<0.2	0	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR*	TEQ (mg/kg)	0.3	<0.3	0.242	134	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2*	TEQ (mg/kg)	0.2	<0.2	0.121	175	0
			Total PAH (18)	mg/kg	0.8	<0.8	0	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.6	0.51	30	15
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	0
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.6	0.53	30	7
SE147117.007	LB091732.021		Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthylene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluorene	mg/kg	0.1	<0.1	<0.1	200	0
			Phenanthrene	mg/kg	0.1	0.1	0.2	95	19
			Anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluoranthene	mg/kg	0.1	0.3	0.3	64	10
			Pyrene	mg/kg	0.1	0.3	0.3	63	16
			Benzo(a)anthracene	mg/kg	0.1	0.2	0.2	84	27
			Chrysene	mg/kg	0.1	0.1	0.2	107	31
			Benzo(b&j)fluoranthene	mg/kg	0.1	0.1	0.1	107	15
			Benzo(k)fluoranthene	mg/kg	0.1	0.1	0.1	130	0
			Benzo(a)pyrene	mg/kg	0.1	0.1	0.1	110	8
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	163	0
			Carcinogenic PAHs, BaP TEQ <LOR=0*	TEQ (mg/kg)	0.2	<0.2	<0.2	130	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR*	TEQ (mg/kg)	0.3	<0.3	<0.3	118	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2*	TEQ (mg/kg)	0.2	0.2	0.2	100	3
			Total PAH (18)	mg/kg	0.8	1.4	1.5	87	9
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	30	0
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	2
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	2

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

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

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

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

PCBs in Soil

Method: ME-(AU)-[ENV]AN400/AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE147094.015	LB091730.026		Arochlor 1016	mg/kg	0.2	<0.2	0	200	0
			Arochlor 1221	mg/kg	0.2	<0.2	0	200	0
			Arochlor 1232	mg/kg	0.2	<0.2	0	200	0
			Arochlor 1242	mg/kg	0.2	<0.2	0	200	0
			Arochlor 1248	mg/kg	0.2	<0.2	0	200	0
			Arochlor 1254	mg/kg	0.2	<0.2	0	200	0
			Arochlor 1260	mg/kg	0.2	<0.2	0	200	0
			Arochlor 1262	mg/kg	0.2	<0.2	0	200	0
			Arochlor 1268	mg/kg	0.2	<0.2	0	200	0
			Total PCBs (Arochlors)	mg/kg	1	<1	0	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0	0.16	30	2
SE147094.022	LB091730.025		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	24
SE147094.034	LB091732.022		Arochlor 1016	mg/kg	0.2	<0.2	0	200	0
			Arochlor 1221	mg/kg	0.2	<0.2	0	200	0
			Arochlor 1232	mg/kg	0.2	<0.2	0	200	0
			Arochlor 1242	mg/kg	0.2	<0.2	0	200	0
			Arochlor 1248	mg/kg	0.2	<0.2	0	200	0
			Arochlor 1254	mg/kg	0.2	<0.2	0	200	0
			Arochlor 1260	mg/kg	0.2	<0.2	0	200	0
			Arochlor 1262	mg/kg	0.2	<0.2	0	200	0
			Arochlor 1268	mg/kg	0.2	<0.2	0	200	0
			Total PCBs (Arochlors)	mg/kg	1	<1	0	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0	0.153	30	0

Total Recoverable Metals in Soil by ICPOES

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE147094.009	LB091836.014		Arsenic, As	mg/kg	3	7	8	43	18
			Cadmium, Cd	mg/kg	0.3	0.3	0.3	123	2
			Chromium, Cr	mg/kg	0.3	12	13	34	10
			Copper, Cu	mg/kg	0.5	15	15	33	0
			Lead, Pb	mg/kg	1	20	20	35	1
			Nickel, Ni	mg/kg	0.5	9.7	9.8	35	2
			Zinc, Zn	mg/kg	0.5	43	47	34	9
SE147094.018	LB091836.024		Arsenic, As	mg/kg	3	8	7	44	17
			Cadmium, Cd	mg/kg	0.3	0.5	0.5	89	3
			Chromium, Cr	mg/kg	0.3	19	28	32	34 ②
			Copper, Cu	mg/kg	0.5	21	25	32	15
			Lead, Pb	mg/kg	1	21	22	35	6
			Nickel, Ni	mg/kg	0.5	20	26	32	25
			Zinc, Zn	mg/kg	0.5	52	62	34	19
SE147094.029	LB091837.014		Arsenic, As	mg/kg	3	6	6	47	5
			Cadmium, Cd	mg/kg	0.3	0.6	0.6	80	2
			Chromium, Cr	mg/kg	0.3	20	22	32	9
			Copper, Cu	mg/kg	0.5	28	30	32	6
			Lead, Pb	mg/kg	1	57	52	32	9
			Nickel, Ni	mg/kg	0.5	25	25	32	1
			Zinc, Zn	mg/kg	0.5	110	120	32	8
SE147101.010	LB091837.024		Arsenic, As	mg/kg	3	2.64090140702.2754184682		71	15
			Cadmium, Cd	mg/kg	0.3	0.32519077670.3220378654		123	1
			Chromium, Cr	mg/kg	0.3	10.21980797090.5703400947		35	3
			Copper, Cu	mg/kg	0.5	32.80405667552.9510218009		31	0

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

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

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

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

Total Recoverable Metals in Soil by ICPOES (continued)

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE147101.010	LB091837.024	Lead, Pb	mg/kg	1	6.95079439137.1586896303		44	3
		Nickel, Ni	mg/kg	0.5	3.23649927553.5978036587		45	11
		Zinc, Zn	mg/kg	0.5	19.378047786220.0382416682		40	3

Trace Metals (Dissolved) in Water by ICPMS

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE147075.001	LB091699.014	Zinc, Zn	µg/L	5	210	210	17	1
SE147094.031	LB091699.018	Arsenic, As	µg/L	1	<1	<1	200	0
		Cadmium, Cd	µg/L	0.1	<0.1	<0.1	200	0
		Chromium, Cr	µg/L	1	<1	<1	200	0
		Copper, Cu	µg/L	1	1	<1	133	12
		Lead, Pb	µg/L	1	<1	<1	200	0
		Nickel, Ni	µg/L	1	<1	<1	200	0
		Zinc, Zn	µg/L	5	<5	<5	152	0

TRH (Total Recoverable Hydrocarbons) in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE147094.015	LB091730.026		TRH C10-C14	mg/kg	20	<20	0	200	0
			TRH C15-C28	mg/kg	45	<45	0	200	0
			TRH C29-C36	mg/kg	45	<45	0	200	0
			TRH C37-C40	mg/kg	100	<100	0	200	0
			TRH C10-C36 Total	mg/kg	110	<110	0	200	0
			TRH C10-C40 Total	mg/kg	210	<210	0	200	0
		TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	<25	0	200	0
			TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	<25	0	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	0	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	0	200	0
SE147094.022	LB091730.025		TRH C10-C14	mg/kg	20	<20	<20	173	0
			TRH C15-C28	mg/kg	45	<45	59	130	27
			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	mg/kg	210	<210	<210	200	0
		TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	<25	35	119	33
			TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	<25	35	119	33
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0
SE147094.033	LB091732.022		TRH C10-C14	mg/kg	20	73	68	58	7
			TRH C15-C28	mg/kg	45	140	161	60	12
			TRH C29-C36	mg/kg	45	230	258	49	13
			TRH C37-C40	mg/kg	100	<100	0	200	0
			TRH C10-C36 Total	mg/kg	110	440	487	54	9
			TRH C10-C40 Total	mg/kg	210	440	487	75	9
		TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	84	78	61	7
			TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	84	78	61	7
			TRH >C16-C34 (F3)	mg/kg	90	290	330	59	14
			TRH >C34-C40 (F4)	mg/kg	120	<120	0	200	0
SE147117.007	LB091732.021		TRH C10-C14	mg/kg	20	<20	<20	200	0
			TRH C15-C28	mg/kg	45	<45	<45	200	0
			TRH C29-C36	mg/kg	45	<45	<45	200	0
			TRH C37-C40	mg/kg	100	<100	<100	200	0
			TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
			TRH C10-C40 Total	mg/kg	210	<210	<210	200	0
		TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	<25	<25	200	0
			TRH >C10-C16 (F2) - Naphthalene	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]AN433/AN434

Original	Duplicate	Parameter	Units	LOR

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

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

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

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

VOC's in Soil (continued)

Method: ME-(AU)-[ENV]AN433/AN434

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE147094.011	LB091692.014	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	Dibromofluoromethane (Surrogate)	mg/kg	-	3.9	3.7	50	5
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.6	4.4	50	5
			d8-toluene (Surrogate)	mg/kg	-	6.0	6.2	50	4
			Bromofluorobenzene (Surrogate)	mg/kg	-	4.4	4.2	50	5
		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
SE147094.021	LB091692.025	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	Dibromofluoromethane (Surrogate)	mg/kg	-	3.6	3.6	50	1
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.4	4.3	50	3
			d8-toluene (Surrogate)	mg/kg	-	6.2	6.2	50	1
			Bromofluorobenzene (Surrogate)	mg/kg	-	5.0	5.6	50	13
		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
SE147094.033	LB091693.014	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	Dibromofluoromethane (Surrogate)	mg/kg	-	3.6	3.6	50	0
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.1	4.2	50	2
			d8-toluene (Surrogate)	mg/kg	-	4.4	4.4	50	1
			Bromofluorobenzene (Surrogate)	mg/kg	-	5.0	5.3	50	5
		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
SE147094.034	LB091693.016	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	Dibromofluoromethane (Surrogate)	mg/kg	-	4.0	3.9	50	3
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	5.2	4.4	50	16
			d8-toluene (Surrogate)	mg/kg	-	5.6	4.7	50	17
			Bromofluorobenzene (Surrogate)	mg/kg	-	5.1	4.6	50	10
		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

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433/AN434/AN410

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE147094.011	LB091692.014		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.9	3.7	30	5
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.6	4.4	30	5
			d8-toluene (Surrogate)	mg/kg	-	6.0	6.2	30	4
			Bromofluorobenzene (Surrogate)	mg/kg	-	4.4	4.2	30	5
		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
SE147094.021	LB091692.025		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0

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

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

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

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

Volatile Petroleum Hydrocarbons in Soil (continued) — **Method: ME-(AU)-[ENV]AN433/AN434/AN410**

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE147094.021	LB091692.025	Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.6	3.6	30	1
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.4	4.3	30	3
			d8-toluene (Surrogate)	mg/kg	-	6.2	6.2	30	1
			Bromofluorobenzene (Surrogate)	mg/kg	-	5.0	5.6	30	13
		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
SE147094.033	LB091693.014		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.6	3.6	30	0
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.1	4.2	30	2
			d8-toluene (Surrogate)	mg/kg	-	4.4	4.4	30	1
			Bromofluorobenzene (Surrogate)	mg/kg	-	5.0	5.3	30	5
		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
SE147094.034	LB091693.016		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.0	3.9	30	3
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	5.2	4.4	30	16
			d8-toluene (Surrogate)	mg/kg	-	5.6	4.7	30	17
			Bromofluorobenzene (Surrogate)	mg/kg	-	5.1	4.6	30	10
		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

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 %
LB091900.002	Mercury	mg/kg	0.01	0.20	0.2	70 - 130	99
LB091901.002	Mercury	mg/kg	0.01	0.21	0.2	70 - 130	106

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN400/AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB091730.002		Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	105
		Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	100
		Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	110
		Dieldrin	mg/kg	0.2	<0.2	0.2	60 - 140	90
		Endrin	mg/kg	0.2	<0.2	0.2	60 - 140	95
		p,p'-DDT	mg/kg	0.1	0.2	0.2	60 - 140	80
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.16	0.15	40 - 130	103
LB091732.002		Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	115
		Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	115
		Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	105
		Dieldrin	mg/kg	0.2	0.2	0.2	60 - 140	115
		Endrin	mg/kg	0.2	0.2	0.2	60 - 140	120
		p,p'-DDT	mg/kg	0.1	0.2	0.2	60 - 140	100
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.19	0.15	40 - 130	129

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN400/AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB091730.002		Dichlorvos	mg/kg	0.5	1.8	2	60 - 140	90
		Diazinon (Dimpylate)	mg/kg	0.5	1.9	2	60 - 140	96
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	1.7	2	60 - 140	85
		Ethion	mg/kg	0.2	1.8	2	60 - 140	88
	Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	78
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	104
LB091732.002		Dichlorvos	mg/kg	0.5	2.0	2	60 - 140	98
		Diazinon (Dimpylate)	mg/kg	0.5	1.9	2	60 - 140	93
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	1.9	2	60 - 140	95
		Ethion	mg/kg	0.2	1.8	2	60 - 140	92
	Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	96
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	98

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB091730.002		Naphthalene	mg/kg	0.1	4.8	4	60 - 140	119
		Acenaphthylene	mg/kg	0.1	4.5	4	60 - 140	113
		Acenaphthene	mg/kg	0.1	4.5	4	60 - 140	112
		Phenanthrene	mg/kg	0.1	4.7	4	60 - 140	118
		Anthracene	mg/kg	0.1	4.9	4	60 - 140	122
		Fluoranthene	mg/kg	0.1	4.8	4	60 - 140	119
		Pyrene	mg/kg	0.1	4.7	4	60 - 140	118
		Benzo(a)pyrene	mg/kg	0.1	4.4	4	60 - 140	111
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	88
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	78
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	104
LB091732.002		Naphthalene	mg/kg	0.1	4.5	4	60 - 140	112
		Acenaphthylene	mg/kg	0.1	4.6	4	60 - 140	114
		Acenaphthene	mg/kg	0.1	4.3	4	60 - 140	108
		Phenanthrene	mg/kg	0.1	4.4	4	60 - 140	111
		Anthracene	mg/kg	0.1	4.1	4	60 - 140	102
		Fluoranthene	mg/kg	0.1	4.5	4	60 - 140	113
		Pyrene	mg/kg	0.1	4.4	4	60 - 140	110
		Benzo(a)pyrene	mg/kg	0.1	4.2	4	60 - 140	106
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	98
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	96
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	98

PCBs in Soil

Method: ME-(AU)-[ENV]AN400/AN420

Sample Number	Parameter	Units	LOR

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.

PCBs in Soil (continued)

Method: ME-(AU)-[ENV]AN400/AN420

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB091730.002	Arochlor 1260	mg/kg	0.2	0.4	0.4	60 - 140	111
LB091732.002	Arochlor 1260	mg/kg	0.2	0.5	0.4	60 - 140	115

Total Recoverable Metals in Soil by ICPOES

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB091836.002	Arsenic, As	mg/kg	3	48	50	80 - 120	97
	Cadmium, Cd	mg/kg	0.3	49	50	80 - 120	97
	Chromium, Cr	mg/kg	0.3	48	50	80 - 120	96
	Copper, Cu	mg/kg	0.5	49	50	80 - 120	98
	Lead, Pb	mg/kg	1	49	50	80 - 120	97
	Nickel, Ni	mg/kg	0.5	48	50	80 - 120	96
	Zinc, Zn	mg/kg	0.5	50	50	80 - 120	99
LB091837.002	Arsenic, As	mg/kg	3	49	50	80 - 120	99
	Cadmium, Cd	mg/kg	0.3	49	50	80 - 120	99
	Chromium, Cr	mg/kg	0.3	48	50	80 - 120	96
	Copper, Cu	mg/kg	0.5	50	50	80 - 120	99
	Lead, Pb	mg/kg	1	49	50	80 - 120	98
	Nickel, Ni	mg/kg	0.5	49	50	80 - 120	98
	Zinc, Zn	mg/kg	0.5	50	50	80 - 120	101

Trace Metals (Dissolved) in Water by ICPMS

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB091699.002	Arsenic, As	µg/L	1	19	20	80 - 120	96
	Cadmium, Cd	µg/L	0.1	20	20	80 - 120	102
	Chromium, Cr	µg/L	1	21	20	80 - 120	104
	Copper, Cu	µg/L	1	21	20	80 - 120	107
	Lead, Pb	µg/L	1	21	20	80 - 120	106
	Nickel, Ni	µg/L	1	21	20	80 - 120	105
	Zinc, Zn	µg/L	5	21	20	80 - 120	106

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB091730.002		TRH C10-C14	mg/kg	20	41	40	60 - 140	103
		TRH C15-C28	mg/kg	45	<45	40	60 - 140	95
		TRH C29-C36	mg/kg	45	<45	40	60 - 140	78
	TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	40	40	60 - 140	100
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	85
		TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	75
LB091732.002		TRH C10-C14	mg/kg	20	43	40	60 - 140	108
		TRH C15-C28	mg/kg	45	<45	40	60 - 140	103
		TRH C29-C36	mg/kg	45	<45	40	60 - 140	95
	TRH F Bands	TRH >C10-C16 (F2)	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	85

TRH (Total Recoverable Hydrocarbons) in Water

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB091733.002		TRH C10-C14	µg/L	50	1300	1200	60 - 140	105
		TRH C15-C28	µg/L	200	1400	1200	60 - 140	117
		TRH C29-C36	µg/L	200	1400	1200	60 - 140	121
	TRH F Bands	TRH >C10-C16 (F2)	µg/L	60	1400	1200	60 - 140	114
		TRH >C16-C34 (F3)	µg/L	500	1500	1200	60 - 140	121
		TRH >C34-C40 (F4)	µg/L	500	690	600	60 - 140	115

VOC's in Soil

Method: ME-(AU)-[ENV]AN433/AN434

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB091692.002	Monocyclic	Benzene	mg/kg	0.1	2.6	2.9	60 - 140	90
	Aromatic	Toluene	mg/kg	0.1	2.4	2.9	60 - 140	81
		Ethylbenzene	mg/kg	0.1	2.2	2.9	60 - 140	74
		m/p-xylene	mg/kg	0.2	4.0	5.8	60 - 140	69
		o-xylene	mg/kg	0.1	1.9	2.9	60 - 140	67
	Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.7	5	60 - 140	75

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.

VOC's in Soil (continued)

Method: ME-(AU)-[ENV]AN433/AN434

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB091692.002	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.4	5	60 - 140	87
		d8-toluene (Surrogate)	mg/kg	-	5.5	5	60 - 140	110
		Bromofluorobenzene (Surrogate)	mg/kg	-	4.4	5	60 - 140	87
LB091693.002	Monocyclic	Benzene	mg/kg	0.1	2.4	2.9	60 - 140	82
	Aromatic	Toluene	mg/kg	0.1	2.3	2.9	60 - 140	79
		Ethylbenzene	mg/kg	0.1	2.3	2.9	60 - 140	80
		m/p-xylene	mg/kg	0.2	4.8	5.8	60 - 140	82
		o-xylene	mg/kg	0.1	2.0	2.9	60 - 140	70
	Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.9	5	60 - 140	97
		d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.8	5	60 - 140	95
		d8-toluene (Surrogate)	mg/kg	-	5.1	5	60 - 140	102
		Bromofluorobenzene (Surrogate)	mg/kg	-	4.5	5	60 - 140	89

VOCs in Water

Method: ME-(AU)-[ENV]AN433/AN434

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB091916.002	Monocyclic	Benzene	µg/L	0.5	52	45.45	60 - 140	114
	Aromatic	Toluene	µg/L	0.5	52	45.45	60 - 140	114
		Ethylbenzene	µg/L	0.5	52	45.45	60 - 140	114
		m/p-xylene	µg/L	1	100	90.9	60 - 140	113
		o-xylene	µg/L	0.5	52	45.45	60 - 140	114
	Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	4.5	5	60 - 140	90
		d4-1,2-dichloroethane (Surrogate)	µg/L	-	4.9	5	60 - 140	98
		d8-toluene (Surrogate)	µg/L	-	5.0	5	60 - 140	101
		Bromofluorobenzene (Surrogate)	µg/L	-	4.6	5	60 - 140	92

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433/AN434/AN410

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB091692.002		TRH C6-C10	mg/kg	25	<25	24.65	60 - 140	89
		TRH C6-C9	mg/kg	20	<20	23.2	60 - 140	74
	Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.7	5	60 - 140	75
		d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.4	5	60 - 140	87
		d8-toluene (Surrogate)	mg/kg	-	5.5	5	60 - 140	110
		Bromofluorobenzene (Surrogate)	mg/kg	-	4.4	5	60 - 140	87
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	7.25	60 - 140	123
LB091693.002		TRH C6-C10	mg/kg	25	<25	24.65	60 - 140	94
		TRH C6-C9	mg/kg	20	20	23.2	60 - 140	87
	Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.9	5	60 - 140	97
		d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.8	5	60 - 140	95
		d8-toluene (Surrogate)	mg/kg	-	5.1	5	60 - 140	102
		Bromofluorobenzene (Surrogate)	mg/kg	-	4.5	5	60 - 140	89
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	7.25	60 - 140	128

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433/AN434/AN410

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB091916.002		TRH C6-C10	µg/L	50	950	946.63	60 - 140	101
		TRH C6-C9	µg/L	40	780	818.71	60 - 140	95
	Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	4.5	5	60 - 140	90
		d4-1,2-dichloroethane (Surrogate)	µg/L	-	4.9	5	60 - 140	98
		d8-toluene (Surrogate)	µg/L	-	5.0	5	60 - 140	101
		Bromofluorobenzene (Surrogate)	µg/L	-	4.6	5	60 - 140	92
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	µg/L	50	640	639.67	60 - 140	100

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

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

Mercury (dissolved) in Water

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE147094.031	LB091971.004	Mercury	mg/L	0.0001	0.0083	<0.0001	0.008	104

Mercury in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE147082.020	LB091900.004	Mercury	mg/kg	0.01	0.15	0.01739502233	0.2	68 ④
SE147094.019	LB091901.004	Mercury	mg/kg	0.01	0.21	0.02	0.2	95

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN400/AN420

QC Sample	Sample Number		Parameter	Units	LOR	Original	Spike	Recovery%
SE147094.001	LB091730.026		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	110
			Aldrin	mg/kg	0.1	<0.1	0.2	105
			Beta BHC	mg/kg	0.1	<0.1	-	-
			Delta BHC	mg/kg	0.1	<0.1	0.2	115
			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	98
			Endrin	mg/kg	0.2	<0.2	0.2	105
			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	90
			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)	mg/kg	-	0.16	-	90

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN400/AN420

QC Sample	Sample Number		Parameter	Units	LOR	Original	Spike	Recovery%
SE147094.001	LB091730.026		Dichlorvos	mg/kg	0.5	<0.5	2	96
			Dimethoate	mg/kg	0.5	<0.5	-	-
			Diazinon (Dimpylate)	mg/kg	0.5	<0.5	2	100
			Fenitrothion	mg/kg	0.2	<0.2	-	-
			Malathion	mg/kg	0.2	<0.2	-	-
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	2	107
			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	90
			Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	-	-
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	-	80
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	-	106
SE147094.025	LB091732.022		Dichlorvos	mg/kg	0.5	<0.5	2	100
			Dimethoate	mg/kg	0.5	<0.5	-	-
			Diazinon (Dimpylate)	mg/kg	0.5	<0.5	2	110
			Fenitrothion	mg/kg	0.2	<0.2	-	-
			Malathion	mg/kg	0.2	<0.2	-	-
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	2	123

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

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

OP Pesticides in Soil (continued)

Method: ME-(AU)-[ENV]AN400/AN420

QC Sample	Sample Number		Parameter	Units	LOR	Original	Spike	Recovery%
SE147094.025	LB091732.022		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	124
			Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	-	-
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	-	90
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	-	110

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Original	Spike	Recovery%
SE147094.001	LB091730.026		Naphthalene	mg/kg	0.1	<0.1	4	119
			2-methylnaphthalene	mg/kg	0.1	<0.1	-	-
			1-methylnaphthalene	mg/kg	0.1	<0.1	-	-
			Acenaphthylene	mg/kg	0.1	<0.1	4	114
			Acenaphthene	mg/kg	0.1	<0.1	4	112
			Fluorene	mg/kg	0.1	<0.1	-	-
			Phenanthrene	mg/kg	0.1	<0.1	4	117
			Anthracene	mg/kg	0.1	<0.1	4	118
			Fluoranthene	mg/kg	0.1	<0.1	4	127
			Pyrene	mg/kg	0.1	<0.1	4	116
			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	123
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	-	-
			Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1	-	-
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=0*	TEQ	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	-	0.5	-	100
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	-	80
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	-	106
SE147094.025	LB091732.022		Naphthalene	mg/kg	0.1	<0.1	4	116
			2-methylnaphthalene	mg/kg	0.1	<0.1	-	-
			1-methylnaphthalene	mg/kg	0.1	<0.1	-	-
			Acenaphthylene	mg/kg	0.1	<0.1	4	118
			Acenaphthene	mg/kg	0.1	<0.1	4	113
			Fluorene	mg/kg	0.1	<0.1	-	-
			Phenanthrene	mg/kg	0.1	<0.1	4	120
			Anthracene	mg/kg	0.1	<0.1	4	111
			Fluoranthene	mg/kg	0.1	<0.1	4	122
			Pyrene	mg/kg	0.1	<0.1	4	120
			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	109
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	-	-
			Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1	-	-
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=0*	TEQ	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	-	0.5	-	104
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	-	90
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	-	110

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.

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PCBs in Soil

Method: ME-(AU)-[ENV]AN400/AN420

QC Sample	Sample Number		Parameter	Units	LOR	Original	Spike	Recovery%
SE147094.001	LB091730.027		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	0.4	116
			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)	mg/kg	-	0	-	93

Total Recoverable Metals in Soil by ICPOES

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE147082.020	LB091836.004	Arsenic, As	mg/kg	3	43	5.35787041746	50	74
		Cadmium, Cd	mg/kg	0.3	38	0.38062517857	50	76
		Chromium, Cr	mg/kg	0.3	66	31.7612185332€	50	69 ④
		Copper, Cu	mg/kg	0.5	57	17.1973509470:	50	80
		Lead, Pb	mg/kg	1	50	15.8954855052€	50	69 ④
		Nickel, Ni	mg/kg	0.5	55	20.7648645444:	50	68 ④
		Zinc, Zn	mg/kg	0.5	69	32.9791544514:	50	72

Trace Metals (Dissolved) in Water by ICPMS

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE147040.018	LB091699.004	Arsenic, As	µg/L	1	19	<1	20	96
		Cadmium, Cd	µg/L	0.1	21	<0.1	20	103
		Chromium, Cr	µg/L	1	21	<1	20	106
		Copper, Cu	µg/L	1	36	14	20	107
		Lead, Pb	µg/L	1	22	<1	20	107
		Nickel, Ni	µg/L	1	22	<1	20	108
		Zinc, Zn	µg/L	5	34	14	20	102

TRH (Total Recoverable Hydrocarbons) in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Original	Spike	Recovery%
SE147094.001	LB091730.027		TRH C10-C14	mg/kg	20	<20	40	108
			TRH C15-C28	mg/kg	45	<45	40	100
			TRH C29-C36	mg/kg	45	<45	40	95
			TRH C37-C40	mg/kg	100	<100	-	-
			TRH C10-C36 Total	mg/kg	110	<110	-	-
			TRH C10-C40 Total	mg/kg	210	<210	-	-
		TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	<25	40	105
			TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	<25	-	-
			TRH >C16-C34 (F3)	mg/kg	90	<90	40	98
			TRH >C34-C40 (F4)	mg/kg	120	<120	-	-
SE147094.023	LB091732.023		TRH C10-C14	mg/kg	20	<20	40	105
			TRH C15-C28	mg/kg	45	<45	40	100
			TRH C29-C36	mg/kg	45	<45	40	85
			TRH C37-C40	mg/kg	100	<100	-	-
			TRH C10-C36 Total	mg/kg	110	<110	-	-
			TRH C10-C40 Total	mg/kg	210	<210	-	-
		TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	<25	40	103
			TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	<25	-	-
			TRH >C16-C34 (F3)	mg/kg	90	<90	40	100
			TRH >C34-C40 (F4)	mg/kg	120	<120	-	-

VOC's in Soil

Method: ME-(AU)-[ENV]AN433/AN434

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE147071.001	LB091692.004	Monocyclic	Benzene	mg/kg	0.1	1.9	<0.1	2.9	66
		Aromatic	Toluene	mg/kg	0.1	2.2	0.2	2.9	70
			Ethylbenzene	mg/kg	0.1	2.1	0.2	2.9	64
			m/p-xylene	mg/kg	0.2	5.2	0.6	5.8	80
			o-xylene	mg/kg	0.1	2.0	0.2	2.9	63
		Polycyclic	Naphthalene	mg/kg	0.1	2.7	3.6	-	-

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

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

VOC's in Soil (continued)

Method: ME-(AU)-[ENV]AN433/AN434

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE147071.001	LB091692.004	Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.7	4.8	-	94
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	3.6	3.7	-	73
			d8-toluene (Surrogate)	mg/kg	-	4.1	4.3	-	83
			Bromofluorobenzene (Surrogate)	mg/kg	-	4.1	4.6	-	83
		Totals	Total Xylenes*	mg/kg	0.3	7.2	0.8	-	-
			Total BTEX*	mg/kg	0.6	13	1.2	-	-
SE147094.022	LB091693.004	Monocyclic	Benzene	mg/kg	0.1	2.4	<0.1	2.9	83
		Aromatic	Toluene	mg/kg	0.1	2.3	<0.1	2.9	79
			Ethylbenzene	mg/kg	0.1	2.3	<0.1	2.9	78
			m/p-xylene	mg/kg	0.2	4.9	<0.2	5.8	85
			o-xylene	mg/kg	0.1	2.3	<0.1	2.9	79
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.6	3.7	-	72
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	3.8	3.8	-	75
			d8-toluene (Surrogate)	mg/kg	-	4.0	3.8	-	81
			Bromofluorobenzene (Surrogate)	mg/kg	-	4.6	4.7	-	91
		Totals	Total Xylenes*	mg/kg	0.3	7.2	<0.3	-	-
			Total BTEX*	mg/kg	0.6	14	<0.6	-	-

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433/AN434/AN410

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE147071.001	LB091692.004		TRH C6-C10	mg/kg	25	73	51	24.65	89
			TRH C6-C9	mg/kg	20	33	<20	23.2	75
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.7	4.8	-	94
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	3.6	3.7	-	73
			d8-toluene (Surrogate)	mg/kg	-	4.1	4.3	-	83
			Bromofluorobenzene (Surrogate)	mg/kg	-	4.1	4.6	-	83
		VPH F	Benzene (F0)	mg/kg	0.1	1.9	<0.1	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	59	49	7.25	135
SE147094.022	LB091693.004		TRH C6-C10	mg/kg	25	<25	<25	24.65	86
			TRH C6-C9	mg/kg	20	<20	<20	23.2	79
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.6	3.7	-	72
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	3.8	3.8	-	75
			d8-toluene (Surrogate)	mg/kg	-	4.0	3.8	-	81
			Bromofluorobenzene (Surrogate)	mg/kg	-	4.6	4.7	-	91
		VPH F	Benzene (F0)	mg/kg	0.1	2.4	<0.1	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	7.25	97

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

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

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

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

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

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:
http://www.sgs.com.au/~/media/Local/Australia/Documents/Technical%20Documents/MP-AU-ENV-QU-022%20QA%20QC%20Plan.pdf

*	NATA accreditation does not cover tthe performance of this service.
-	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 Analytical Report comments for further information.

STATEMENT OF QA/QC PERFORMANCE

SE147094A R0

CLIENT DETAILS

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Client	Environmental Investigations
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Project	**E22817 37-39 Pavesi St Guildford - Add**
Order Number	**E22817**
Samples	36

LABORATORY DETAILS

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SGS Reference	**SE147094A R0**
Date Received	21 Dec 2015
Date Reported	30 Dec 2015

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS Environmental Services' 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 and was supplied by the Client.
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	Volatile Petroleum Hydrocarbons in Soil	1 item
Matrix Spike	TRH (Total Recoverable Hydrocarbons) in Soil	4 items

SAMPLE SUMMARY

Sample counts by matrix	3 Soils	Type of documentation received	Email
Date documentation received	21/12/15@2:37pm	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	11.6°C
Sample container provider	SGS	Turnaround time requested	Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	Ice Bricks	Samples clearly labelled	Yes
Complete documentation received	Yes		

HOLDING TIME SUMMARY

SE147094A R0

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

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

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Fibre Identification in soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH117M_1.0-1.1	SE147094A.026	LB092544	10 Dec 2015	21 Dec 2015	09 Dec 2016	29 Dec 2015	09 Dec 2016	30 Dec 2015
BH118_1.0-1.1	SE147094A.036	LB092544	10 Dec 2015	21 Dec 2015	09 Dec 2016	29 Dec 2015	09 Dec 2016	30 Dec 2015

Moisture Content

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH114_1.6-1.7	SE147094A.035	LB092254	10 Dec 2015	21 Dec 2015	24 Dec 2015	22 Dec 2015	27 Dec 2015	23 Dec 2015

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
BH114_1.6-1.7	SE147094A.035	LB092228	10 Dec 2015	21 Dec 2015	24 Dec 2015	21 Dec 2015	30 Jan 2016	29 Dec 2015

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433/AN434/AN410

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH114_1.6-1.7	SE147094A.035	LB092220	10 Dec 2015	21 Dec 2015	24 Dec 2015	21 Dec 2015	30 Jan 2016	29 Dec 2015

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

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

Volatile Petroleum Hydrocarbons in Soil — **Method: ME-(AU)-[ENV]AN433/AN434/AN410**

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH114_1.6-1.7	SE147094A.035	%	60 - 130%	58 †
d4-1,2-dichloroethane (Surrogate)	BH114_1.6-1.7	SE147094A.035	%	60 - 130%	86
d8-toluene (Surrogate)	BH114_1.6-1.7	SE147094A.035	%	60 - 130%	78
Dibromofluoromethane (Surrogate)	BH114_1.6-1.7	SE147094A.035	%	60 - 130%	62

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.

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB092228.001	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

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433/AN434/AN410

Sample Number		Parameter	Units	LOR	Result
LB092220.001		TRH C6-C9	mg/kg	20	<20
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	90
		d4-1,2-dichloroethane (Surrogate)	%	-	122
		d8-toluene (Surrogate)	%	-	109

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

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

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

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

Moisture Content

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE147371.034	LB092254.011	% Moisture	%w/w	0.5	18.47389558238.3168316831		35	1
SE147380.008	LB092254.022	% Moisture	%w/w	0.5	6.32630410656.7643742953		45	7
SE147390.006	LB092254.033	% Moisture	%w/w	0.5	16.29889669007.0927318295		36	5
SE147394.009	LB092254.044	% Moisture	%w/w	0.5	13.38411316643.3849557522		37	0

TRH (Total Recoverable Hydrocarbons) in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE147380.004	LB092228.014		TRH C10-C14	mg/kg	20	226	166	40	31
			TRH C15-C28	mg/kg	45	2766	2232	32	21
			TRH C29-C36	mg/kg	45	96	118	72	21
			TRH C37-C40	mg/kg	100	0	0	200	0
			TRH C10-C36 Total	mg/kg	110	3088	2516	34	20
			TRH C10-C40 Total	mg/kg	210	3088	2516	37	20
		TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	675	502	34	29
			TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	674.99	502	34	29
			TRH >C16-C34 (F3)	mg/kg	90	2409	2003	34	18
			TRH >C34-C40 (F4)	mg/kg	120	0	0	200	0
SE147380.012	LB092228.023		TRH C10-C14	mg/kg	20	0	0	200	0
			TRH C15-C28	mg/kg	45	49	54	117	10
			TRH C29-C36	mg/kg	45	0	0	200	0
			TRH C37-C40	mg/kg	100	0	0	200	0
			TRH C10-C36 Total	mg/kg	110	49	54	200	0
			TRH C10-C40 Total	mg/kg	210	49	54	200	0
		TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	0	0	200	0
			TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	-0.33	0	200	0
			TRH >C16-C34 (F3)	mg/kg	90	0	0	200	0
			TRH >C34-C40 (F4)	mg/kg	120	0	0	200	0

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433/AN434/AN410

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE147380.004	LB092220.014		TRH C6-C10	mg/kg	25	8.76	0	200	0
			TRH C6-C9	mg/kg	20	7.36	0	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.74	3.61	30	4
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	5.84	5.53	30	5
			d8-toluene (Surrogate)	mg/kg	-	5.51	5.64	30	2
			Bromofluorobenzene (Surrogate)	mg/kg	-	3.96	4.45	30	12
		VPH F Bands	Benzene (F0)	mg/kg	0.1	0	0	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	8.74	-0.04	200	0
SE147380.012	LB092220.025		TRH C6-C10	mg/kg	25	23.37	18.18	150	0
			TRH C6-C9	mg/kg	20	18.82	14.47	150	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.01	3.72	30	8
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	5.5	4.95	30	11
			d8-toluene (Surrogate)	mg/kg	-	6.25	5.58	30	11
			Bromofluorobenzene (Surrogate)	mg/kg	-	4.45	3.59	30	21
		VPH F Bands	Benzene (F0)	mg/kg	0.1	0.02	0.02	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	22.53	17.44	155	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.

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB092228.002		TRH C10-C14	mg/kg	20	34	40	60 - 140	85
		TRH C15-C28	mg/kg	45	<45	40	60 - 140	93
		TRH C29-C36	mg/kg	45	<45	40	60 - 140	68
	TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	34	40	60 - 140	85
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	95
		TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	65

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433/AN434/AN410

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB092220.002		TRH C6-C10	mg/kg	25	<25	24.65	60 - 140	91
		TRH C6-C9	mg/kg	20	<20	23.2	60 - 140	84
	Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.6	5	60 - 140	72
		d4-1,2-dichloroethane (Surrogate)	mg/kg	-	5.1	5	60 - 140	101
		d8-toluene (Surrogate)	mg/kg	-	4.6	5	60 - 140	93
		Bromofluorobenzene (Surrogate)	mg/kg	-	4.3	5	60 - 140	86
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	7.25	60 - 140	125

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

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

TRH (Total Recoverable Hydrocarbons) in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Original	Spike	Recovery%
SE147094A.03	LB092228.024		TRH C10-C14	mg/kg	20	63	40	58 ④
5			TRH C15-C28	mg/kg	45	100	40	8 ④
			TRH C29-C36	mg/kg	45	<45	40	73
			TRH C37-C40	mg/kg	100	<100	-	-
			TRH C10-C36 Total	mg/kg	110	170	-	-
			TRH C10-C40 Total	mg/kg	210	<210	-	-
		TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	98	40	15 ④
			TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	98	-	-
			TRH >C16-C34 (F3)	mg/kg	90	<90	40	30 ④
			TRH >C34-C40 (F4)	mg/kg	120	<120	-	-

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433/AN434/AN410

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE147094A.03	LB092220.004		TRH C6-C10	mg/kg	25	<25	<25	24.65	94
5			TRH C6-C9	mg/kg	20	<20	<20	23.2	82
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.7	3.1	-	74
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	5.0	4.3	-	100
			d8-toluene (Surrogate)	mg/kg	-	4.8	3.9	-	97
			Bromofluorobenzene (Surrogate)	mg/kg	-	3.5	2.9	-	70
		VPH F	Benzene (F0)	mg/kg	0.1	2.9	<0.1	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	7.25	122

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

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

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

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

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

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:
http://www.sgs.com.au/~/media/Local/Australia/Documents/Technical%20Documents/MP-AU-ENV-QU-022%20QA%20QC%20Plan.pdf

*	NATA accreditation does not cover tthe performance of this service.
-	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 Analytical Report comments for further information.

STATEMENT OF QA/QC PERFORMANCE

SE147250 R0

CLIENT DETAILS

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Project	**E22817 - Pavesi Street Guildford West**
Order Number	**E22817**
Samples	6

LABORATORY DETAILS

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SGS Reference	**SE147250 R0**
Date Received	16 Dec 2015
Date Reported	23 Dec 2015

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS Environmental Services' 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 and was supplied by the Client.
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:

Matrix Spike	Trace Metals (Dissolved) in Water by ICPMS	1 item

SAMPLE SUMMARY

Sample counts by matrix	6 Waters	Type of documentation received	COC
Date documentation received	16/12/2015	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	8.7°C
Sample container provider	SGS	Turnaround time requested	Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	Ice Bricks	Samples clearly labelled	Yes
Complete documentation received	Yes		

HOLDING TIME SUMMARY

SE147250 R0

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

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

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Mercury (dissolved) in Water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH104M	SE147250.001	LB092266	15 Dec 2015	16 Dec 2015	12 Jan 2016	22 Dec 2015	12 Jan 2016	22 Dec 2015
BH106M	SE147250.002	LB092266	15 Dec 2015	16 Dec 2015	12 Jan 2016	22 Dec 2015	12 Jan 2016	22 Dec 2015
BH117M	SE147250.003	LB092266	15 Dec 2015	16 Dec 2015	12 Jan 2016	22 Dec 2015	12 Jan 2016	22 Dec 2015
GWQD-1	SE147250.004	LB092266	15 Dec 2015	16 Dec 2015	12 Jan 2016	22 Dec 2015	12 Jan 2016	22 Dec 2015
QR-2	SE147250.005	LB092266	15 Dec 2015	16 Dec 2015	12 Jan 2016	22 Dec 2015	12 Jan 2016	22 Dec 2015

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
BH104M	SE147250.001	LB092026	15 Dec 2015	16 Dec 2015	22 Dec 2015	17 Dec 2015	26 Jan 2016	23 Dec 2015
BH106M	SE147250.002	LB092026	15 Dec 2015	16 Dec 2015	22 Dec 2015	17 Dec 2015	26 Jan 2016	23 Dec 2015
BH117M	SE147250.003	LB092026	15 Dec 2015	16 Dec 2015	22 Dec 2015	17 Dec 2015	26 Jan 2016	23 Dec 2015
GWQD-1	SE147250.004	LB092026	15 Dec 2015	16 Dec 2015	22 Dec 2015	17 Dec 2015	26 Jan 2016	23 Dec 2015
QR-2	SE147250.005	LB092026	15 Dec 2015	16 Dec 2015	22 Dec 2015	17 Dec 2015	26 Jan 2016	23 Dec 2015

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
BH104M	SE147250.001	LB092068	15 Dec 2015	16 Dec 2015	12 Jun 2016	18 Dec 2015	12 Jun 2016	21 Dec 2015
BH106M	SE147250.002	LB092068	15 Dec 2015	16 Dec 2015	12 Jun 2016	18 Dec 2015	12 Jun 2016	21 Dec 2015
BH117M	SE147250.003	LB092068	15 Dec 2015	16 Dec 2015	12 Jun 2016	18 Dec 2015	12 Jun 2016	21 Dec 2015
GWQD-1	SE147250.004	LB092068	15 Dec 2015	16 Dec 2015	12 Jun 2016	18 Dec 2015	12 Jun 2016	21 Dec 2015
QR-2	SE147250.005	LB092068	15 Dec 2015	16 Dec 2015	12 Jun 2016	18 Dec 2015	12 Jun 2016	21 Dec 2015

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
BH104M	SE147250.001	LB092026	15 Dec 2015	16 Dec 2015	22 Dec 2015	17 Dec 2015	26 Jan 2016	23 Dec 2015
BH106M	SE147250.002	LB092026	15 Dec 2015	16 Dec 2015	22 Dec 2015	17 Dec 2015	26 Jan 2016	23 Dec 2015
BH117M	SE147250.003	LB092026	15 Dec 2015	16 Dec 2015	22 Dec 2015	17 Dec 2015	26 Jan 2016	23 Dec 2015
GWQD-1	SE147250.004	LB092026	15 Dec 2015	16 Dec 2015	22 Dec 2015	17 Dec 2015	26 Jan 2016	23 Dec 2015
QR-2	SE147250.005	LB092026	15 Dec 2015	16 Dec 2015	22 Dec 2015	17 Dec 2015	26 Jan 2016	23 Dec 2015

VOCs in Water

Method: ME-(AU)-[ENV]AN433/AN434

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH104M	SE147250.001	LB092056	15 Dec 2015	16 Dec 2015	22 Dec 2015	18 Dec 2015	27 Jan 2016	23 Dec 2015
BH106M	SE147250.002	LB092056	15 Dec 2015	16 Dec 2015	22 Dec 2015	18 Dec 2015	27 Jan 2016	23 Dec 2015
BH117M	SE147250.003	LB092056	15 Dec 2015	16 Dec 2015	22 Dec 2015	18 Dec 2015	27 Jan 2016	23 Dec 2015
GWQD-1	SE147250.004	LB092056	15 Dec 2015	16 Dec 2015	22 Dec 2015	18 Dec 2015	27 Jan 2016	23 Dec 2015
QR-2	SE147250.005	LB092056	15 Dec 2015	16 Dec 2015	22 Dec 2015	18 Dec 2015	27 Jan 2016	23 Dec 2015
Trip Spike	SE147250.006	LB092056	15 Dec 2015	16 Dec 2015	22 Dec 2015	18 Dec 2015	27 Jan 2016	23 Dec 2015

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433/AN434/AN410

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH104M	SE147250.001	LB092056	15 Dec 2015	16 Dec 2015	22 Dec 2015	18 Dec 2015	27 Jan 2016	23 Dec 2015
BH106M	SE147250.002	LB092056	15 Dec 2015	16 Dec 2015	22 Dec 2015	18 Dec 2015	27 Jan 2016	23 Dec 2015
BH117M	SE147250.003	LB092056	15 Dec 2015	16 Dec 2015	22 Dec 2015	18 Dec 2015	27 Jan 2016	23 Dec 2015
GWQD-1	SE147250.004	LB092056	15 Dec 2015	16 Dec 2015	22 Dec 2015	18 Dec 2015	27 Jan 2016	23 Dec 2015
QR-2	SE147250.005	LB092056	15 Dec 2015	16 Dec 2015	22 Dec 2015	18 Dec 2015	27 Jan 2016	23 Dec 2015
Trip Spike	SE147250.006	LB092056	15 Dec 2015	16 Dec 2015	22 Dec 2015	18 Dec 2015	27 Jan 2016	23 Dec 2015

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

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

PAH (Polynuclear Aromatic Hydrocarbons) in Water

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	BH104M	SE147250.001	%	40 - 130%	58
	BH106M	SE147250.002	%	40 - 130%	60
	BH117M	SE147250.003	%	40 - 130%	50
d14-p-terphenyl (Surrogate)	BH104M	SE147250.001	%	40 - 130%	80
	BH106M	SE147250.002	%	40 - 130%	80
	BH117M	SE147250.003	%	40 - 130%	60
d5-nitrobenzene (Surrogate)	BH104M	SE147250.001	%	40 - 130%	58
	BH106M	SE147250.002	%	40 - 130%	56
	BH117M	SE147250.003	%	40 - 130%	46

VOCs in Water

Method: ME-(AU)-[ENV]AN433/AN434

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH104M	SE147250.001	%	40 - 130%	105
	BH106M	SE147250.002	%	40 - 130%	102
	BH117M	SE147250.003	%	40 - 130%	106
	GWQD-1	SE147250.004	%	40 - 130%	107
	QR-2	SE147250.005	%	40 - 130%	106
	Trip Spike	SE147250.006	%	40 - 130%	94
d4-1,2-dichloroethane (Surrogate)	BH104M	SE147250.001	%	40 - 130%	118
	BH106M	SE147250.002	%	40 - 130%	120
	BH117M	SE147250.003	%	40 - 130%	116
	GWQD-1	SE147250.004	%	40 - 130%	107
	QR-2	SE147250.005	%	40 - 130%	109
	Trip Spike	SE147250.006	%	40 - 130%	100
d8-toluene (Surrogate)	BH104M	SE147250.001	%	40 - 130%	98
	BH106M	SE147250.002	%	40 - 130%	96
	BH117M	SE147250.003	%	40 - 130%	96
	GWQD-1	SE147250.004	%	40 - 130%	98
	QR-2	SE147250.005	%	40 - 130%	97
	Trip Spike	SE147250.006	%	40 - 130%	99
Dibromofluoromethane (Surrogate)	BH104M	SE147250.001	%	40 - 130%	119
	BH106M	SE147250.002	%	40 - 130%	122
	BH117M	SE147250.003	%	40 - 130%	115
	GWQD-1	SE147250.004	%	40 - 130%	109
	QR-2	SE147250.005	%	40 - 130%	113
	Trip Spike	SE147250.006	%	40 - 130%	100

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433/AN434/AN410

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH104M	SE147250.001	%	40 - 130%	105
	BH106M	SE147250.002	%	40 - 130%	102
	BH117M	SE147250.003	%	40 - 130%	106
	GWQD-1	SE147250.004	%	40 - 130%	107
	QR-2	SE147250.005	%	40 - 130%	106
d4-1,2-dichloroethane (Surrogate)	BH104M	SE147250.001	%	60 - 130%	118
	BH106M	SE147250.002	%	60 - 130%	120
	BH117M	SE147250.003	%	60 - 130%	116
	GWQD-1	SE147250.004	%	60 - 130%	107
	QR-2	SE147250.005	%	60 - 130%	109
d8-toluene (Surrogate)	BH104M	SE147250.001	%	40 - 130%	98
	BH106M	SE147250.002	%	40 - 130%	96
	BH117M	SE147250.003	%	40 - 130%	96
	GWQD-1	SE147250.004	%	40 - 130%	98
	QR-2	SE147250.005	%	40 - 130%	97
Dibromofluoromethane (Surrogate)	BH104M	SE147250.001	%	40 - 130%	119
	BH106M	SE147250.002	%	40 - 130%	122
	BH117M	SE147250.003	%	40 - 130%	115
	GWQD-1	SE147250.004	%	40 - 130%	109
	QR-2	SE147250.005	%	40 - 130%	113

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/AN312

Sample Number	Parameter	Units	LOR	Result
LB092266.001	Mercury	mg/L	0.0001	<0.0001

PAH (Polynuclear Aromatic Hydrocarbons) in Water

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

Sample Number		Parameter	Units	LOR	Result
LB092026.001		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(a&h)anthracene	µg/L	0.1	<0.1
		Benzo(ghi)perylene	µg/L	0.1	<0.1
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	104
		2-fluorobiphenyl (Surrogate)	%	-	98
		d14-p-terphenyl (Surrogate)	%	-	124

Trace Metals (Dissolved) in Water by ICPMS

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

Sample Number	Parameter	Units	LOR	Result
LB092068.001	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 Water

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

Sample Number	Parameter	Units	LOR	Result
LB092026.001	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

VOCs in Water

Method: ME-(AU)-[ENV]AN433/AN434

Sample Number		Parameter	Units	LOR	Result
LB092056.001	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)-[ENV]AN433/AN434

Sample Number		Parameter	Units	LOR	Result
LB092056.001	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
		1,2,3-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	<1
		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	Dibromofluoromethane (Surrogate)	%	-	118
		d4-1,2-dichloroethane (Surrogate)	%	-	117
		d8-toluene (Surrogate)	%	-	100
		Bromofluorobenzene (Surrogate)	%	-	93
	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 Water

Method: ME-(AU)-[ENV]AN433/AN434/AN410

Sample Number	Parameter	Units	LOR

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

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

Volatile Petroleum Hydrocarbons in Water (continued)

Method: ME-(AU)-[ENV]AN433/AN434/AN410

Sample Number		Parameter	Units	LOR	Result
LB092056.001		TRH C6-C9	µg/L	40	<40
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	118
		d4-1,2-dichloroethane (Surrogate)	%	-	117
		d8-toluene (Surrogate)	%	-	100
		Bromofluorobenzene (Surrogate)	%	-	93

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

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

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

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

Mercury (dissolved) in Water

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE147396.005	LB092266.017	Mercury	µg/L	0.0001	-0.0394	<0.0001	149	0

Trace Metals (Dissolved) in Water by ICPMS

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE147251.003	LB092068.014	Arsenic, As	µg/L	1	2.263	1.934	63	16
		Cadmium, Cd	µg/L	0.1	0.029	0.025	200	0
		Chromium, Cr	µg/L	1	0.303	0.366	200	0
		Copper, Cu	µg/L	1	4.128	4.23	39	2
		Lead, Pb	µg/L	1	0.224	0.207	200	0
		Nickel, Ni	µg/L	1	2.773	2.821	51	2
		Zinc, Zn	µg/L	5	24.695	25.299	35	2
SE147298.001	LB092068.024	Arsenic, As	µg/L	1	1.04	1.101	108	6
		Cadmium, Cd	µg/L	0.1	-0.008	-0.003	200	0
		Chromium, Cr	µg/L	1	0.241	0.227	200	0
		Copper, Cu	µg/L	1	3.84	3.79	41	1
		Lead, Pb	µg/L	1	0.061	0.082	200	0
		Nickel, Ni	µg/L	1	3.999	3.921	40	2
		Zinc, Zn	µg/L	5	6.533	11.331	71	54

VOCs in Water

Method: ME-(AU)-[ENV]AN433/AN434

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE147250.004	LB092056.018	Monocyclic	Benzene	µg/L	0.5	<0.5	0.14	200	0
		Aromatic	Toluene	µg/L	0.5	<0.5	0.32	186	0
			Ethylbenzene	µg/L	0.5	<0.5	0.05	200	0
			m/p-xylene	µg/L	1	<1	0.12	200	0
			o-xylene	µg/L	0.5	<0.5	0.05	200	0
		Polycyclic	Naphthalene	µg/L	0.5	<0.5	0	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	5.5	5.61	30	3
			d4-1,2-dichloroethane (Surrogate)	µg/L	-	5.3	5.58	30	4
			d8-toluene (Surrogate)	µg/L	-	4.9	5.04	30	2
			Bromofluorobenzene (Surrogate)	µg/L	-	5.4	5.04	30	6

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433/AN434/AN410

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE147250.004	LB092056.018		TRH C6-C10	µg/L	50	<50	0	200	0
			TRH C6-C9	µg/L	40	<40	0	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	5.5	5.61	30	3
			d4-1,2-dichloroethane (Surrogate)	µg/L	-	5.3	5.58	30	4
			d8-toluene (Surrogate)	µg/L	-	4.9	5.04	30	2
			Bromofluorobenzene (Surrogate)	µg/L	-	5.4	5.04	30	6
		VPH F Bands	Benzene (F0)	µg/L	0.5	<0.5	0.14	200	0
			TRH C6-C10 minus BTEX (F1)	µg/L	50	<50	-0.68	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.

PAH (Polynuclear Aromatic Hydrocarbons) in Water

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB092026.002		Naphthalene	µg/L	0.1	34	40	60 - 140	85
		Acenaphthylene	µg/L	0.1	36	40	60 - 140	90
		Acenaphthene	µg/L	0.1	39	40	60 - 140	97
		Phenanthrene	µg/L	0.1	47	40	60 - 140	118
		Anthracene	µg/L	0.1	40	40	60 - 140	101
		Fluoranthene	µg/L	0.1	35	40	60 - 140	89
		Pyrene	µg/L	0.1	40	40	60 - 140	99
		Benzo(a)pyrene	µg/L	0.1	38	40	60 - 140	95
	Surrogates	d5-nitrobenzene (Surrogate)	µg/L	-	0.5	0.5	40 - 130	90
		2-fluorobiphenyl (Surrogate)	µg/L	-	0.5	0.5	40 - 130	94
		d14-p-terphenyl (Surrogate)	µg/L	-	0.6	0.5	40 - 130	124

Trace Metals (Dissolved) in Water by ICPMS

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB092068.002		Arsenic, As	µg/L	1	19	20	80 - 120	96
		Cadmium, Cd	µg/L	0.1	20	20	80 - 120	101
		Chromium, Cr	µg/L	1	21	20	80 - 120	105
		Copper, Cu	µg/L	1	22	20	80 - 120	108
		Lead, Pb	µg/L	1	21	20	80 - 120	105
		Nickel, Ni	µg/L	1	21	20	80 - 120	107
		Zinc, Zn	µg/L	5	21	20	80 - 120	105

TRH (Total Recoverable Hydrocarbons) in Water

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB092026.002		TRH C10-C14	µg/L	50	1100	1200	60 - 140	90
		TRH C15-C28	µg/L	200	1200	1200	60 - 140	101
		TRH C29-C36	µg/L	200	1300	1200	60 - 140	105
	TRH F Bands	TRH >C10-C16 (F2)	µg/L	60	1200	1200	60 - 140	99
		TRH >C16-C34 (F3)	µg/L	500	1200	1200	60 - 140	102
		TRH >C34-C40 (F4)	µg/L	500	640	600	60 - 140	106

VOCs in Water

Method: ME-(AU)-[ENV]AN433/AN434

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB092056.002	Halogenated	1,1-dichloroethene	µg/L	0.5	51	45.45	60 - 140	112
	Aliphatics	1,2-dichloroethane	µg/L	0.5	49	45.45	60 - 140	108
		Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	50	45.45	60 - 140	110
	Halogenated	Chlorobenzene	µg/L	0.5	50	45.45	60 - 140	110
	Monocyclic	Benzene	µg/L	0.5	50	45.45	60 - 140	110
	Aromatic	Toluene	µg/L	0.5	50	45.45	60 - 140	110
		Ethylbenzene	µg/L	0.5	50	45.45	60 - 140	110
		m/p-xylene	µg/L	1	100	90.9	60 - 140	110
		o-xylene	µg/L	0.5	50	45.45	60 - 140	110
	Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	4.2	5	60 - 140	83
		d4-1,2-dichloroethane (Surrogate)	µg/L	-	4.2	5	60 - 140	83
		d8-toluene (Surrogate)	µg/L	-	4.7	5	60 - 140	95
		Bromofluorobenzene (Surrogate)	µg/L	-	5.9	5	60 - 140	118
	Trihalomethan	Chloroform (THM)	µg/L	0.5	50	45.45	60 - 140	110

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433/AN434/AN410

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB092056.002		TRH C6-C10	µg/L	50	950	946.63	60 - 140	101
		TRH C6-C9	µg/L	40	780	818.71	60 - 140	95
	Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	4.5	5	60 - 140	90
		d4-1,2-dichloroethane (Surrogate)	µg/L	-	4.9	5	60 - 140	98
		d8-toluene (Surrogate)	µg/L	-	5.0	5	60 - 140	101
		Bromofluorobenzene (Surrogate)	µg/L	-	4.6	5	60 - 140	92
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	µg/L	50	650	639.67	60 - 140	102

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

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

Mercury (dissolved) in Water — Method: ME-(AU)-[ENV]AN311/AN312

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE147188.010	LB092266.004	Mercury	mg/L	0.0001	0.0084	<0.0001	0.008	106

Trace Metals (Dissolved) in Water by ICPMS — Method: ME-(AU)-[ENV]AN318

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE147247.001	LB092068.004	Arsenic, As	µg/L	1	27	0.428	20	131
		Cadmium, Cd	µg/L	0.1	20	0.04	20	100
		Chromium, Cr	µg/L	1	29	9.842	20	95
		Copper, Cu	µg/L	1	20	2.18	20	91
		Lead, Pb	µg/L	1	20	0.13	20	99
		Nickel, Ni	µg/L	1	19	1.265	20	89
		Zinc, Zn	µg/L	5	21	6.014	20	75

MATRIX SPIKE DUPLICATES

SE147250 R0

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

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

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

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

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

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:
http://www.sgs.com.au/~/media/Local/Australia/Documents/Technical%20Documents/MP-AU-ENV-QU-022%20QA%20QC%20Plan.pdf

*	NATA accreditation does not cover tthe performance of this service.
-	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 Analytical Report comments for further information.

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)**	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.
Sample Matrix Spike (MS) & Matrix Spike Duplicate (MSD)	Sample replicates spiked with identical concentrations of target analyte(s). The spiking occurs during the sample preparation and prior to the extraction/digestion procedure. 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.
Surrogate Spike (SS)	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.
Control Matrix Spike (CMS)	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.
Internal Standard (IS)	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.
Lab Duplicates (D)	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.
Lab Control Standards/Samples (LCS)	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.
Continuous Calibration Verification (CCV) or **Calibration Check Standard & Blank**	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 ±10%

Quality Assurance Programs are listed below:

Statistical analysis of Quality Control data (SQC)	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".
Certified Reference Materials (CRM/SRM)	Certified Reference Materials and Standards are regularly analysed. These materials/standards have certified reference values for various parameters.
Proficiency Testing	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.
Inter-laboratory & Intra-laboratory Testing	SGS Environmental Services has schedules in the Quality Systems to participate in Inter/Intra laboratory testing conducted internally and by other parties.
Data Acceptance Criteria Unless otherwise specified in the method or method manual the following general criteria apply to all inorganic tests. All recoveries are to be reported to 3 significant figures.	Failure to meet the internal acceptance criteria will result in sample batch repeats dependent upon investigation outcomes. For data to be accepted: <u>Inorganics (water samples)</u> • 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 ±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♬ Duplicate recovery RPD to be <30%. • Where CRMs are used, results to be within ± 2 standard deviations of the expected value. <u>Inorganics (soil samples)</u> • 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 ±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♬/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.

Data Acceptance Criteria Unless otherwise specified in the method or method manual the following general criteria apply to all organic tests. All recoveries are to be reported to 3 significant figures.	Organics • 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 ±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♬/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).

*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.
♬Matrix 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

Table QC1 - Containers, Preservation Requirements and Holding Times - Soil			
□arameter	Container	□reservation	Maximum Holding Time
□cid digestible metals and metalloids □Total and TCL□ □□s,Cd.,Cu,Cr,□i,□b,□n□	Glass with Teflon Lid	□il	□ months
Mercury	Glass with Teflon Lid	□il	□□ days
T□H □BT□X □VOC □SVOC □CHC	Glass with Teflon Lid	□°C, □ero heads□ace	□□ days
□□Hs □total and TCL□□	Glass with Teflon Lid	□°C □	□□ days
□henols	Glass with Teflon Lid	□°C □	□□ days
OC□s, O□□s and total □CBs	Glass with Teflon Lid	□°C □	□□ days
□sbestos	Sealed □lastic Bag	□il	□ □□

Table QC2 - Containers, Preservation Requirements and Holding Times - Water			
□arameter	Container Volume □mL□	□reservation	Maximum Holding Time
Heavy Metals	□□□mL □lastic	Field filtration □.□□µm H□O□ □□°C	□ months
Cyanide	□□□mL □mber Glass	□H □ □□ □aOH □□°C	□ months
T□H □C□□C□□□BT□X □VOCs SVOCs □CHCs	□x □□mL Glass	HCl □□°C □	□□ days
T□H □C□□□C□□□□□□H □□henolics OC□ □O□□ □TDS □□H	□x □L □mber Glass	□one □□°C □	□□ days

Notes: □ □ □xtraction within □□ days, □nalysis within □□ days.

Table QC3 - Analytical Parameters, PQLs and Methods - Soil			
Parameter	**Unit**	**PQL**	**Method Reference**
Metals in Soil			
Arsenic - As^1	mg / kg	1	US EPA 200.7
Cadmium - Cd^1	mg / kg	0.5	US EPA 200.7
Chromium - Cr^1	mg / kg	1	US EPA 200.7
Copper - Cu^1	mg / kg	1	US EPA 200.7
Lead - Pb^1	mg / kg	1	US EPA 200.7
Mercury - Hg^2	mg / kg	0.[illegible]	US EPA 7471A
Nickel - Ni^1	mg / kg	1	US EPA 200.7
Zinc - Zn^1	mg / kg	1	US EPA 200.7
Total Petroleum Hydrocarbons (TPHs) in Soil			
C_6–C_9 fraction	mg / kg	25	US EPA 8260
C_{10}–C_{14} fraction	mg / kg	50	US EPA 8000
C_{15}–C_{28} fraction	mg / kg	100	US EPA 8000
C_{29}–C_{36} fraction	mg / kg	100	US EPA 8000
BTEX in Soil			
Benzene	mg / kg	1	US EPA 8260
Toluene	mg / kg	1	US EPA 8260
Ethylbenzene	mg / kg	1	US EPA 8260
m & p Xylene	mg / kg	2	US EPA 8260
o- Xylene	mg / kg	1	US EPA 8260
Other Organic Contaminants in Soil			
PAHs	mg / kg	0.05 – 0.2	US EPA 8270
CHCs	mg / kg	1	US EPA 8260
VOCs	mg / kg	1	US EPA 8260
SVOCs	mg / kg	1	US EPA 8260
OCPs	mg / kg	0.1	US EPA 8140, 8080
OPPs	mg / kg	0.1	US EPA 8140, 8080
PCBs	mg / kg	0.1	US EPA 8080
Phenolics	mg / kg	5	APHA 5530
Asbestos			
Asbestos	mg / kg	Presence / Absence	AS 4964-2004

Notes:

1. Acid Soluble Metals by ICP-MS
2. Total Recoverable Mercury

Table QC4 - Analytical Parameters, PQLs and Methods - Groundwater

Parameter	Unit	PQL	Method
Heavy Metals			
□ntimony □Sb	µg□L	□	□S□□□ □□□.□
□rsenic □□s	µg□L	□	□S□□□ □□□.□
Beryllium □Be	µg□L	□.□	□S□□□ □□□.□
Cadmium □Cd	µg□L	□.□	□S□□□ □□□.□
Chromium □Cr	µg□L	□	□S□□□ □□□.□
Cobalt □Co	µg□L	□	□S□□□ □□□.□
Co□□er □Cu	µg□L	□	□S□□□ □□□.□
Lead □□b	µg□L	□	□S□□□ □□□.□
Mercury □Hg	µg□L	□.□	□S□□□ □□□□□
Molybdenum □Mo	µg□L	□	□S□□□ □□□.□
□ic□el □□i	µg□L	□	□S□□□ □□□.□
Selenium □Se	µg□L	□	□S□□□ □□□.□
Silver □□g	µg□L	□	□S□□□ □□□.□
Tin □inorg.□□Sn	µg□L	□	□S□□□ □□□.□
□ic□el □□i	µg□L	□	□S□□□ □□□.□
□inc □□n	µg□L	□	□S□□□ □□□.□
Total Petroleum Hydrocarbons (TPHs)			
C□□C□ fraction	µg□L	□□	□S□□□ □□□□□ □ □□□□
C□□□C□□ fraction	µg□L	□□	□S□□□ □□□□
C□□□C□□ fraction	µg□L	□□□	□S□□□ □□□□
C□□□C□□ fraction	µg□L	□□□	□S□□□ □□□□
BTEX			
Ben□ene	µg□L	□	□S□□□ □□□□□
Toluene	µg□L	□	□S□□□ □□□□□
□thylben□ene	µg□L	□	□S□□□ □□□□□
m□□ □Xylene	µg□L	□	□S□□□ □□□□□
o□Xylene	µg□L	□	□S□□□ □□□□□
Polyciclic Aromatic Hydrocarbons (PAHs)			
□□Hs	µg□L	□.□	□S□□□ □□□□
Ben□o□a□□yrene	µg□L	□.□□	□S□□□ □□□□
OrganoChlorine Pesticides (OCPs)			
□ldrin	µg□L	□.□□□	□S□□□ □□□□
Chlordane	µg□L	□.□□□	□S□□□ □□□□
DDT	µg□L	□.□□□	□S□□□ □□□□
Dieldrin	µg□L	□.□□□	□S□□□ □□□□
□ndosulfan	µg□L	□.□□□	□S□□□ □□□□
□ndrin	µg□L	□.□□□	□S□□□ □□□□
He□tachlor	µg□L	□.□□□	□S□□□ □□□□
Lindane	µg□L	□.□□□	□S□□□ □□□□
Toxa□hene	µg□L	□.□□□	□S□□□ □□□□

Parameter	Unit	PQL	Method
Chlorinated Hydrocarbons (CHCs)			
□,□□dichloroben□ene	µg□L	□	□S□□□ □□□□B
□,□□dichloroben□ene	µg□L	□	□S□□□ □□□□B
□,□□dichloroben□ene	µg□L	□	□S□□□ □□□□B
□,□,□□trichloroben□ene	µg□L	□	□S□□□ □□□□B
□,□,□□trichloroben□ene	µg□L	□	□S□□□ □□□□B
Hexachlorobutadeine	µg□L	□	□S□□□ □□□□B
□,□,□□trichloroethane	µg□L	□	□S□□□ □□□□B
Hexachloroethane	µg□L	□□	□S□□□ □□□□D
Other CHCs	µg□L	□	□S□□□ □□□□B
Volatile Organic Compounds (VOCs)			
□niline	µg□L	□□	□S□□□ □□□□B
□,□□dichloroaniline	µg□L	□□	□S□□□ □□□□B
□,□□dichloroaniline	µg□L	□□	□S□□□ □□□□B
□itroben□ene	µg□L	□□	□S□□□ □□□□B
□,□□dinitrotoluene	µg□L	□□	□S□□□ □□□□B
□,□,□□trinitrotoluene	µg□L	□□	□S□□□ □□□□B
Phenolic Compounds			
□henol	µg□L	□□	□S□□□ □□□□
□□chloro□henol	µg□L	□□	□S□□□ □□□□
□□chloro□henol	µg□L	□□	□S□□□ □□□□
□, □□dichloro□henol	µg□L	□□	□S□□□ □□□□
□,□,□□trichloro□henol	µg□L	□□	□S□□□ □□□□
□,□,□,□□tetrachloro□henol	µg□L	□□	□S□□□ □□□□
□entachloro□henol	µg□L	□□	□S□□□ □□□□
□,□□dinitro□henol	µg□L	□□	□S□□□ □□□□
Miscellaneous Parameters			
Total Cyanide	µg□L	□	□□H□ □□□□C□□C□
Fluoride	µg□L	□□	□□H□ □□□□F□C
Salinity □TDS□	mg□L	□	□□H□ □□□□
□H	units	□.□	□□H□ □□□□H□
OrganoPhosphate Pesticides (OPPs)			
□□in□hos Methyl	µg□L	□.□□	□S□□□ □□□□
Chloro□yrifos	µg□L	□.□□	□S□□□ □□□□
Dia□inon	µg□L	□.□□	□S□□□ □□□□
Dimethoate	µg□L	□.□□	□S□□□ □□□□
Fenitrothion	µg□L	□.□□	□S□□□ □□□□
Malathion	µg□L	□.□□	□S□□□ □□□□
□arathion	µg□L	□.□□	□S□□□ □□□□
Teme□hos	µg□L	□.□□	□S□□□ □□□□
Polychlorinated Biphenyls (PCBs)			
Individual □CBs	µg□L	□.□□	□S□□□ □□□□

Table QC5 - QC Sample Data Acceptance Criteria

QC Sample Type	Method of Assessment	Acceptable Range
Field QC		
Blind Du□licates and S□lit Sam□les	The assessment of s□lit du□licate is underta□en by calculating the Relative □ercent Difference □R□D□of the du□licate concentration com□ared with the □rimary sam□le concentration. The R□D is defined as□ R□D □ □□□ x □X□ □X□ □ / mean □X□, X□□ Where□X□ and X□ are the concentrations of the □rimary and du□licate sam□les.	The acce□table range de□ends u□on the levels detected□ □ □□□□□□ R□D □when the average concentration is □□ times the LOR□□□L□ □ □□□□□ R□D □when the average concentration is □ to □□ times the LOR□□□L□ □ □□□□□ R□D □when the average concentration is □□□ times the LOR□□□L□
Rinsate □ Tri□ Blan□s	□ach blan□is analysed as □er the original sam□les.	□nalytical Result □LOR□□□L
Laboratory □re□ared Tri□ S□i□e	The Tri□ S□i□e is analysed after returning from the field and the □ recovery of the □nown s□i□e is calculated.	□□ □□□□□
Laboratory QC		
Laboratory Du□licates	□ssessment of Lab Du□licate R□D as □er Blind Du□licates and S□lit Sam□les.	Lab Du□licate R□D □ □□□ □Inorganics□ Lab Du□licate R□D □ □□□ □Organics□for sam□le results □ □□ LOR
Surrogates Matrix S□i□es Laboratory Control Sam□les	□ssessment is underta□en by determining the □ercent recovery of the □nown surrogate s□i□e □SS□or addition to the sam□le. □ Recovery □ □□□x C □□ / B Where□□ □ Concentration of analyte determined in the original sam□le□ B □ □dded Concentration□and C □ Calculated Concentration.	at least □ SS recoveries to be within □□□□□□□ sub□ect to matrix effects □Organics□ □□□□□□□ □Inorganics □Metals□ □□□□□□□ □Organics□ □□□□□□□ □SVOC and S□eciated □henols□ If the result is outside the above ranges, the result must be □□x Standard Deviation of the Historical Mean □calculated over the □ast □□ months□
Sam□le Matrix S□i□e Du□licates	Recovery R□D	□□□□ □Inorganics □ Organics□
Calibration Chec□ Standards	Continuous Calibration Verification □CCV□	CCV must be within □□□□ □inorganics□ CCV must be within □□□□ □inorganics□
Reagent, Method □ Calibration Chec□ Blan□s	□ach blan□is analysed as □er the original sam□les.	□nalytical Result □LOR□□□L

□ote□□□L □Laboratory □ractical □uantitation Limit □□□L□or the minimum detection limit for a □articular analyte.
LOR □ Limit of Re□orting

1 OBJECTIVE

This procedure will be used by the laboratory to comply with NEPM requirements for QA/QC reporting (and is typical of other regulatory requirements).

This procedure is applicable to all Environmental samples eg from Environmental Consultants. Samples from non-Environmental Consultants such as Councils, mines or trade waste etc do not necessarily have to conform with these requirements, however, it will be the Envirolab Group's default policy that this procedure be used whenever possible.

2 DEFINITIONS

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.

Blank

This is the component of the analytical signal which is not derived from the sample but from reagents, glassware, instrument etc, can be determined by processing solvents, acids and reagents in exactly the same manner as for samples. Other terms cited in literature, but not used here include: Reagent Blank, Control Blank, Method Blank.

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. Other terms cited in literature include Laboratory Fortified Matrix. It is suggested that the spiking concentration be near the middle of the working calibration range.

Surrogate Spike

Surrogates are known additions to each standard, sample, blank, matrix spike and LCS in a process batch, of compounds which are similar to the analyte of interest in terms of:

a) extraction
b) recovery through clean up procedures
c) response to chromatography or other determinations

but which:

d) are not expected to be found in real samples
e) will not interfere with quantification of any analyte of interest
f) may be separately and independently quantified

These are only applicable to organic testing.

Internal Standards

Internal standards are used to check the consistency of the analytical step (e.g. injections, retention times, potential instrument suppression/enhancement etc) and provide a reference against which results may be adjusted in case of variation. For many organic and metals analyses, internal standards are added after all extraction, cleanup and concentration steps, to each final extract solution/sample/standard.

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. Other terms cited in literature include: laboratory control standard, quality control check sample, laboratory fortified blank.

Process Batch

A group of samples which behave similarly with respect to the sampling or the testing procedures being employed and which are processed as a unit for QC purposes. It is important that all factors within a process batch be the same. If any factors change e.g. reagents, staff, standards then a new process batch is deemed to have begun. A process batch is considered to be ≤20 samples.

Percent Recovery

Percent recovery describes the capability of the method to recover a known amount of analyte added to the sample.

% Recovery = C-A / B x 100

where: A = natural concentration of analyte in the sample
B = concentration of analyte added to the sample
C = concentration of analyte determined in the spiked sample

RPD (Relative Percent Difference)

This calculation measures the precision between two figures. Commonly used to compare the precision of Duplicate results.

% RPD = ((Highest – Lowest)/Average) x 100

3 QC REQUIRED AND WHAT IS REPORTED

The following QC is required for all Environmental Samples, unless justified otherwise by a Manager/Supervisor.

Blank

At least one per process batch.
The Blanks must be labelled throughout the day e.g.: Blk_1, Blk_2 etc.
The Blank is analysed at a rate of one per ≤20 samples.

LCS

At least one per process batch.
The LCS's must be labelled throughout the day e.g.: LCS_1, LCS_2 etc.
The LCS is reported to all clients at a rate of one per ≤20 samples.

Duplicate

At least one per ten samples i.e. a Duplicate is carried ≤ 10 samples.
So, if there is one process batch of 100 samples there will be at least 10 Duplicates.
There are instances where there is insufficient sample for a duplicate analysis and hence the

frequency will not apply, however, every effort will be made to perform a duplicate in each process batch (water volumes supplied for VOC and SVOC are often insufficient).

The Duplicate is only reported to the client if it is performed on their sample.

Matrix Spike

One for each soil/water/air sample (where applicable) type e.g.: if a batch contains soils/waters/air samples then a matrix spike must be done on each sample type at a frequency of 5%, typically a matrix spike is carried out where ≥5 samples and then every 20.

The sample type is generally recorded on the Chain of Custody. If a client calls all samples 'soil' then we will treat all samples as 1 sample type (unless they are very obviously different).
If there is only one sample type e.g. soil, then a matrix spike is performed every 20 samples.

There is no requirement in NEPM for a Matrix Spike Duplicate.

The Matrix Spike is only reported to the client if it is performed on their sample.

Certified/Standard Reference Materials

Where available, CRMs/SRMs are analysed (particularly during validation/verification). Due to the high cost and lack of stability of many CRMs/SRMs, the frequency of analysis is relatively low. Typically SRMs are run for Metals only (e.g. AGAL series 6, 10, 12 for example) as they are cost effective and stable over a long period of time. Therefore once a week or once a month is not uncommon.

4 ACCEPTANCE CRITERIA

If QC fails, take corrective action promptly to determine and eliminate the source of the error. Do not report data until the cause of the problem is identified and either corrected or qualified by a supervisor.

Matrix Spikes

As a general rule, the recoveries of most analytes spiked into samples should fall within the range 60% - 140% and this range should be used as a guide in evaluating in house performance, exceptions exist within individual methods. (*see tables 1-3 below for global acceptance criteria*).

Matrix Spikes will regularly fail, often due to matrix interferences. If a Matrix Spike fails it should be investigated:

a) check calculations and transcriptions to ensure a mistake has not been made.

b) look at the background concentration of the sample. If sample background is high then recovery can be affected (sample heterogeneity). A useful rule of thumb is where background concentration of an analyte is >3* the spike level then the spike recovery is n/a, however, where the sample is very non-homogenous acceptable spike recovery may be difficult. As long as the LCS is acceptable (*see below*) then the Process Batch will be accepted.

c) If the LCS has also failed then the Process Batch is deemed to have failed and data should not be reported unless justified. The batch should be repeated after consultation with the supervisor, possibly replacing standards or reagents (see guidelines below).

If a matrix spike has failed yet the process batch has been accepted by the supervisor, the failed

matrix spike should still be reported to the client (unless the spiked sample has very high background levels). This should be accompanied by an appropriate comment such as 'percent recovery not available due to significant background levels of analyte in the sample' or 'the matrix spike recovery was outside recommended acceptance criteria, however, an acceptable recovery was achieved for the LCS. This indicates a sample matrix interference'.

Matrix spikes are not carried out for all tests. These exceptions are mainly the inorganic tests such as TSS, pH, EC etc. and OHS samples (tubes/badges/filters/swabs etc) where all the sample is extracted as opposed to a portion. In these cases an acceptable LCS is required.

Matrix spikes are also not reported for all analytes. For example in a SVOC run of >100 analytes it is acceptable to only spike a range of analytes e.g. some PAHs, some OCP, some OPP, some speciated Phenols etc.

Duplicates

Acceptable Duplicate data is judged by % RPD.

See tables 1-3 below for acceptance criteria, the acceptance criteria will increase as the analyte concentration approaches the PQL as measurement uncertainty will become a more significant factor.

If a water duplicate fails then repeat the analysis (if there is sufficient sample left). If the RPD% fails again it is likely to be due to a non-homogeneity or a matrix issue and an appropriate comment should be applied to the report such as 'the duplicate is outside acceptable %RPD, re-analysis indicates possible sample heterogeneity'. All failed duplicate results should be reported, a triplicate should be reported to illustrate analyte variability where applicable. *Poor reproducibility for water samples is rare unless the sediment loading is significant*.

If a soil duplicate fails then it should be repeated (if there is sufficient sample left). If the RPD% fails again it is likely to be due to a matrix non-homogeneity issue and an appropriate comment should be applied to the report such as 'the duplicate is outside acceptable %RPD, reanalysis indicates possible sample heterogeneity'. All failed duplicate results should be reported and a triplicate should be reported to illustrate analyte variability where applicable. Soil matrices are a common issue with poor analyte precision given samples are typically prepared field moist

If an air duplicate fails then it should be repeated (if there is sufficient sample left). Duplicates for air samples are only applicable for canister and air sample (tedlar) bag analyses, precision failures should be rare given the relative simplicity of the matrix, however variation will be higher near reporting limits (PQL).

Internal Standards

Acceptance criteria for internal standards are 70-130% for Metals and 50-150% for Organics, note exceptions may exist in individual methods – see tables 1 and 3 below.

If internal standards exceed this criteria they will need to be either re-vialed and re-run for organics or diluted and re-run for metals. If they continue to fail consult the supervisor.

Surrogates

Surrogate recoveries should generally be within the range of 60-140%, table 3 below.

High analyte concentrations may cause surrogates to fail – this needs to be annotated on the final report (e.g. for svTRH).

The surrogate recovery in BLKs and LCSs should be within Global Acceptance Criteria (GAC) or Analyte Specific Acceptance Criteria (ASAC) for labile surrogates (e.g. d5-phenol etc.). The GAC and ASAC are discussed in more detail below.

Certified/Standard Reference Materials

CRMs/SRM recoveries should generally be within the range of 70-130%. Some certified levels are below or within 10*PQL and therefore ±30% tolerance is not achievable on all instruments (e.g. some elements in AGAL12 will struggle with this criteria on ICP-OES but should be achieved on ICP-MS due to higher uncertainty based on PQL differences for the two instruments).

Global Acceptance Criteria (GAC) for Matrix Spikes, LCS and BLKS

The criteria specified below covers >90% of the analytes determined by the laboratory, however due to limitation of the methodology and/or the labile nature of some analytes there are analytes whose recovery is outside of this acceptance criteria (GAC). Therefore ***Analyte Specific Acceptance Criteria*** (ASAC) is applied for these analytes. The ASAC is determined from 6-12 months of LCS recovery data and is Defined as 3 x std dev from the mean LCS recovery %.

See GAC in the tables below.

Table 1 – Metals GAC

	ICV	CCV	Internal Standards	LCS	PQL std	Calibration Blank	Matrix Spikes#	%RPD≥ 10*PQL@	5*PQL≤*sample* %*RPD*<10*PQL@	%RPD<5*PQL
Dissolved Waters	±10%	±20%	70-130%	±20%	±50%	<1/2*PQL std	±30%	20	50	any
Impingers	±10%	±20%	70-130%	±20%	±50%	<1/2*PQL std	±30%	30	50	any
Total Waters	±10%	±20%	70-130%	±20%	±50%	<1/2*PQL std	±30%	30	50	any
Soils/Paint/Filters (if cut in pieces)	±10%	±20%	70-130%	±30%	±50%	<1/2*PQL std	±30%	40	50	any

n/a where background is ≥ 3* spike level
@ where an original and duplicate result are above and below a cut off (5* and 10*PQL), then the mean of the two defines the criteria used.

Table 2 – Inorganics GAC

	ICV (LCS in many cases)	CCV	PQL std	Calibration Blank	LCS	Matrix Spikes#	%RPD≥10*PQL@	5*PQL≥*sample %RPD*<10*PQL@	%RPD<5*PQL
Waters - Nutrients no preparation	±20%	±20%	±50%	<1/2*PQL std	±20%	±30%	20	50	any
Waters digested/distilled	±20%	±20%	±50%	<1/2*PQL std	±20%	±30%	30	50	any
Impingers	±20%	±20%	±50%	<1/2*PQL std	±20%	±30%	30	50	any
Soils/Filters (if cut in pieces)	±20%	±20%	±50%	<1/2*PQL std	±30%	±30%	30	50	any

n/a where background is ≥ 3* spike level
@ where an original and duplicate result are above and below a cut off (5* and 10*PQL) then the average defines the criteria used.

Table 3 - Organics (includes Air Toxics unless specified in the method) GAC (TD tubes are an exception for field duplicates)

	ICV (LCS in many cases)	CCV*	Internal Stds	PQL std	Calibration Blank	LCS$	Matrix Spikes#$ and Surrogates	%RPD≥5*PQL (although sampling may be the source of error)	%RPD<5*PQL
Waters/Air Toxic - VOC	±20%	±20%	50-150%	±50%	n/a	±20%	±40%	30	any
Waters extracted	±20%	±20%	50-150%	±50%	n/a	±40%	±40%	50	any
Soils	±20%	±20%	50-150%	±50%	n/a	±40%	±40%	50	any

n/a where background is ≥ 3* spike level
$ - there will be exception to this rule as some analytes are particularly labile and recovery as low as 10% has been documented in the literature (see ASAC).

@ where an original and duplicate result are above and below a cut off (5* and 10*PQL) then the average defines the criteria used.

See MICRO/ASBESTOS and ASS methods for acceptance criteria in those sections.

Decision Path for LCS

As a general rule, the recoveries of most LCS's should fall within the ranges specified in the tables above.

If an LCS fails it should be investigated:-

a) check calculations and transcriptions to ensure a basic mistake has not been made.

b) If all other QC has passed, repeat the LCS analysis. If the LCS fails again it should be re-made and re-analysed.

c) If the LCS fails after the second attempt there could be a problem with the LCS and hence the procedure – consult the supervisor.

If the failure is specific to the LCS then the Process Batch may be acceptable, if not, then repeat the process batch (if sufficient sample available). If insufficient sample is available then the data must be qualified with respect to the LCS result (for example a surrogate is half the expected value for all samples and LCS, this may be due to a setting on a pipette and is not reflective of poor extraction efficiency).

d) If the LCS fails the criteria in the GAC tables above, then compare to the ASAC for the individual analytes (i.e. 3 x stdev of LCS over 6-12 months). If within these criteria then the LCS is acceptable as long as above 10% recovery. Recovery below this limit implies the analytical method in not fit for purpose and hence the data must be qualified accordingly if reported.

There should be an LCS available for >99% of tests (exceptions include Asbestos for example).

Practical Quantitation Limit Checks (PQLs)

As can be seen from the tables above, a PQL standard run in the calibration or as a sample can be used to confirm the ability to determine the PQL on a sequence by sequence basis. This negates the need for MDL studies as the PQL is confirmed for each analytical sequence.

5 CHECKING THE CORRECTNESS OF ANALYSIS (see also form 346)

Anion Cation Balance

The anion and cation sums, when expressed as milliequivalents per litre, must approximately balance because all potable waters are electrically neutral.

As a minimum ion balance is determined from cations:-Na/Ca/Mg/K and anions:- Alk/Cl/SO_4.

The full calculation can be found in APHA and Form 213 - Mass Balance Calculation sheet can be used to determine the ion balance in Excel.

The acceptance criteria in APHA are very strict as they are based on potable water. The environmental waters we receive could rarely be termed potable so our % Difference has been determined to be ±15%, with supervisor discretion.

If the % is >15% for “cation total Meq vs anion total Meq” then there is a possibility of gross error and reruns/checks may be necessary. If the result is confirmed then an appropriate comment must accompany the report such as ‘the mass imbalance may be caused by other ions that have not been measured’. Extremes of pH can also cause an imbalance.

TDS v Ions

Measured TDS should be similar or greater than ion calculated TDS. This is because the calculation will normally not involve ions such as F, Si, NO_3 etc.

Note, as a guide in mg/L:-

0.6(alk) + Cl + SO_4 + Na + Ca + Mg + K + = Approx TDS.

Measured EC and Ion sums

Both the anion & cation sums (expressed as meq) should be 1/100 of the measured EC value. If either of the 2 sums does not meet this criteria, that sum is suspect.

The calculation is: 100 x anion (or cation sum) meq/L = (0.9-1.1 EC).

The full calculation can be found in APHA or use the spreadsheet i.e. Form 213 - Mass Balance Calculation sheet v1. Note another useful rule of thumb is that Chloride (mg/L) is $^1/_3$ of EC.

Measured TDS to EC Ratio

EC x (0.55-0.7) = TDS.

If it is outside this criteria one of the tests may be suspect. The exception is waters with high colloidal particulates that may contribute to a higher measured TDS result.

Metals – Total Recoverable v Dissolved.

In theory Total recoverable metals must be equal or higher than dissolved metals for the same water sample. If the difference is within the uncertainty of the individual tests then this should be noted on the worksheets. If the difference is outside the uncertainty of the individual tests then one of the results is suspect and should be re-analysed for confirmation/denial.

Metals – CrVI vs total dissolved Cr and FeII vs total dissolved Fe

The sample preservation for hexavalent Chromium, Ferrous Iron and the total dissolved Chromium and Iron are from different preservations. Hence different bottles are used during sampling which can lead to variations in results given:-

$Cr^{VI} \leq$ total dissolved Cr and $Fe^{II} \leq$ total dissolved Fe (taking into account some MU in analysis)

A common source of error is where samples for Cr^{VI} and Fe^{II} are not field filtered (into caustic and HCl preserved containers respectively), whereas the total dissolved metals are field filtered into HNO_3 preserved bottles. Therefore interaction with sediment can lead to higher Cr^{VI} and Fe^{II} numbers than would be given if filtered. Therefore, where this occurs a note should be recorded on the report and/or communicated to the customer/sampler.

Organics

Some simple checks to be aware of include:

C_6-C_{10} should generally be greater than BTEX.

>C_{10}-C_{36} should generally be greater than PAH.

Naphthalene in the VOC run should be similar to PAH (SVOC) run, however where the soil is non-homogenous then poor precision may exist. Additionally two different solvent mixes are used which can lead to variability in extraction efficiency.

Nutrients

TKN should be greater than or equal to Ammonia. If the difference is within the uncertainty of the individual tests then this should noted on the worksheets. If the difference is outside the uncertainty of the individual tests then one of the results is suspect and should be reanalysed for confirmation/denial. Use of different bottle for TKN and Ammonia can cause anomalies do to sampling variability.

See form 346 for more detail on checking correctness of data.

6 CONTROL CHARTS

Control Charts can be generated from LIMS as required. LCS data is used to construct these charts. LCS data is a good indication of the health of the method.

Matrix spike and duplicate data can vary significantly due to the nature of certain matrices so are not considered an ideal measure. If a MS result is grossly out due to a known interference then control data will be invalidated as the result is an outlier.

Control charts can used to monitor trends and should alert the analyst to potential problems. In theory all plotted data should lie within 2SD (Warning Limits =WL) of the mean or within the target recovery (e.g. GAC and ASAC recovery limits discussed above).

Results outside the CL or outside the target recovery (e.g. GAC and ASAC recovery limits discussed above) should not be accepted unless there is a valid, documented reason.

7 STANDARDS / CALIBRATIONS

Calibration standards are purchased either in commercial mixes that are traceable to NIST (wherever possible with CoAs) and/or as neat compounds/salts. Where possible, purity of neat compounds/salts is >>95% (as high as available but still cost effective). Standards used for calibration are prepared (working standards) as required and allocated a shelf life in accordance with the methods (in house and via international standards) and in consultation with approved suppliers and senior staff experience.

Calibration standards are verified by an independently sourced standard (where available) as described within individual methods. Standards that are used beyond the specified shelf-life (e.g. the default shelf-life for many commercial standards) must be verified by a standard that is within the specified shelf-life.

Note, inorganic salts with purity >>95% (>99% preferable) typically have a shelf life >10 years (the shelf life is typically not specified by the supplier). The standards from such salts are checked versus other sources of analyte regardless, for example a working standard from a $NaNO_3$ salt (as a Nitrate source) could be confirmed as acceptable for use by checking versus a working standard prepared from a KNO_3 salt (or a commercial mix of NO_3 where a CoA is supplied).

Calibration

In general calibrations are linear or linear through zero (i.e. through the blank). Exceptions to this rule occur where the chemistry is non-linear (e.g. some colourimetric chemistry) and quadratic fits can be used. Another example would be for labile Organic analytes where, for example, breakdown and/or adsorption effects become significant, therefore quadratic fits become necessary.

Calibration curves are constructed for each daily sequence for most instrumentation, the

exceptions would be for some colourimetric chemistries where the reagents are very stable (e.g. NH_3/NO_3/PO_4/CrVI/TKN) and also for some GC-MS/ECD analyses where acceptable response is maintained for all analytes (can be confirmed with PQL standard analyses and S/N observation). To confirm the validity of the calibration curves an Independent Calibration Check (ICV) is run with a tolerance of ±20% of expected result (as described below).

For most methods an Independent Calibration Check (ICC or ICV where V = verification) is analysed straight after the calibration. This should be an independent check (i.e. made from another standard source) and acceptance is defined in the tables 1-3 in section 4 above. If it is outside this acceptance criteria, a new calibration may be necessary and/or calibration standards should be re-prepared and/or the Independent Calibration Check should be re-prepared.

Results may only be reported if within the calibration range (exceptions include ICPOES/IC/FID where linearity way beyond the top standard has been demonstrated in validation data). Results +10% beyond the top standard are acceptable in general where linear calibrations are used, *not* where quadratics are used.

The correlation coefficient (R^2) should be >0.995 for the vast majority of analytes (individual methods may have specific criteria). Where failures occurs, calibration points may be removed as a last resort (e.g. for a poor injection where internal standards are indicative) and should be a rarity as opposed to normal practice. In general 3-5 calibration standards are used to generate a response curve and/or a Continuing Calibration Verification (CCV) standard is run to ensure signal to noise is maintained.

Continuing Calibration
A continuing calibration is analysed approximately every 20 samples and at the end of the run. Acceptance should be ±20%. If it is outside this acceptance a new calibration will be necessary (the ability to maintain the detection limit (PQL) is a requirement i.e. run the PQL standard as described above with the required acceptance criteria (tables 1-3)).

New v's Old Standard Checks
New standards should always be compared to the old with an acceptance of ±10%.

Expired Standards

Standards that have expired may still be used, however, need to be verified against another in date standard, CRM or confirmed by another lab. The expiry date may then be extended a further 6 months (or less as deemed appropriate). For some analytes, such as metals, extending the expiry date for many years may be acceptable as there is known stability.

8 Intralaboratory Check Samples

Soils –

Internally prepared reference materials can be used to check the validity of analysis. Typically for soil, customer samples are collated and are then air dried, homogenised and sieved. The analyte concentrations are then determined by analysing 7-10 replicates to achieve a mean with an RSD%$\leq$30% (although concentration dependant). The results can then be internally (Melbourne ↔ Perth ↔ Sydney lab) verified and/or externally verified with another NATA accredited facility.

Once an acceptable mean and acceptance criteria has been established (professional judgement of the senior chemists can be utilised here), then the material can then be analysed periodically to check laboratory performance. Alternatively, if available, confirm against a CRM/SRM.

Other non-certified reference materials can be used to assess laboratory performance if suitably verified data has been generated (e.g. ELIG soil where 10 labs participated in generating data).

Waters –

The R&D Manager or delegate will periodically prepare QC samples for an ILCP between the labs in the Envirolab Group. Samples may be prepared from standard solutions, independant check solutions and/or solutions remaining from previous proficiency programs (stability may have to be ascertained. These solutions will generally be of known concentration.

Spike solutions using products may also be prepared for comparison purposes e.g. petrol for TRH/BTEX or Diesel for PAHs etc.

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	60mL Plastic	Field filtration 0.45µm HNO_3 / 4°C	6 months
Mercury	60mL Plastic	Field filtration 0.45µm HNO_3 / 4°C	~~6 months~~ 28 days
Cyanide	125mL Amber Glass or 125mL Opaque HDPE	pH > 12 NaOH / 4°C	~~6 months~~ 14 days
TPH (C6-C9) / BTEX / VOCs SVOCs / CHCs	4 x 44mL Glass	HCl / 4°C [1] or Sodium Bisulphate	14 days
TPH (C10-**C40**) / PAH / Phenolics OCP / OPP / TDS / pH	3 x 1L Amber Glass	None / 4°C [1]	28 days (TDS is 7 days, pH is ideally a field test and should be analysed ASAP)

Notes: [1] = Extraction within 14 days, Analysis within 40 days.

Table QC3 - Analytical Parameters, PQLs and Methods - Soil *(Routine Levels)*			
Parameter	**Unit**	**PQL**	**Method Reference**
Metals in Soil			
Arsenic - As[1]	mg / kg	4	USEPA 200.7 (also reference USEPA 6010C and 3050)
Cadmium - Cd[1]	mg / kg	0.4	USEPA 200.7 (also reference USEPA 6010C and 3050)
Chromium - Cr[1]	mg / kg	1	USEPA 200.7 (also reference USEPA 6010C and 3050)
Copper - Cu[1]	mg / kg	1	USEPA 200.7 (also reference USEPA 6010C and 3050)
Lead - Pb[1]	mg / kg	1	USEPA 200.7 (also reference USEPA 6010C and 3050)
Mercury - Hg[2]	mg / kg	0.1	USEPA 7471A (also reference USEPA 3050)
Nickel - Ni[1]	mg / kg	1	USEPA 200.7 (also reference USEPA 6010C and 3050)
Zinc - Zn[1]	mg / kg	1	USEPA 200.7 (also reference USEPA 6010C and 3050)
Total Petroleum Hydrocarbons (TRHs) in Soil			
old fractions			
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
NEPM 2013 Fractions			
C_6-C_{10} fraction	mg / kg	25	USEPA 8260
$>C_{10}$-C_{16} fraction	mg / kg	50	USEPA 8000
$>C_{16}$-C_{34} fraction	mg / kg	100	USEPA 8000
$>C_{34}$-C_{40} fraction	mg / kg	100	USEPA 8000
BTEX in Soil			
Benzene	mg / kg	0.2	USEPA 8260
Toluene	mg / kg	0.5	USEPA 8260
Ethylbenzene	mg / kg	0.5	USEPA 8260
m & p Xylene	mg / kg	1	USEPA 8260
o- Xylene	mg / kg	0.5	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
Heavy Metals			
Antimony - Sb	µg/L	1	USEPA 200.8
Arsenic - As	µg/L	1	USEPA 200.8
Beryllium - Be	µg/L	0.5	USEPA 200.8
Cadmium - Cd	µg/L	0.1	USEPA 200.8
Chromium - Cr	µg/L	1	USEPA 200.8
Cobalt - Co	µg/L	1	USEPA 200.8
Copper - Cu	µg/L	1	USEPA 200.8
Lead - Pb	µg/L	1	USEPA 200.8
Mercury - Hg	µg/L	0.05	USEPA 7471A
Molybdenum - Mo	µg/L	1	USEPA 200.8
Nickel - Ni	µg/L	1	USEPA 200.8
Selenium - Se	µg/L	1	USEPA 200.8
Silver - Ag	µg/L	1	USEPA 200.8
Tin ~~(inorg.)~~ - Sn (all forms)	µg/L	1	USEPA 200.8
Nickel - Ni	µg/L	1	USEPA 200.8
Zinc - Zn	µg/L	1	USEPA 200.8
Total Petroleum Hydrocarbons (TRHs)			
C_6-C_9 fraction	µg/L	10	USEPA 8220A / 8000
C_{10}-C_{14} fraction	µg/L	50	USEPA 8000
C_{15}-C_{28} fraction	µg/L	100	USEPA 8000
C_{29}-C_{36} fraction	µg/L	100	USEPA 8000
NEPM 2013			
C_6-C_{10} fraction	µg/L	10	USEPA 8220A / 8000
>C_{10}-C_{16} fraction	µg/L	50	USEPA 8000
>C_{16}-C_{34} fraction	µg/L	100	USEPA 8000
>C_{34}-C_{40} fraction	µg/L	100	USEPA 8000
BTEX			
Benzene	µg/L	1	USEPA 8260
Toluene	µg/L	1	USEPA 8260
Ethylbenzene	µg/L	1	USEPA 8260
m- & p-Xylene	µg/L	2	USEPA 8260
o-Xylene	µg/L	1	USEPA 8260
Polyciclic Aromatic Hydrocarbons (PAHs)			
PAHs Level 2	µg/L	0.1	USEPA 8270
Benzo(a)pyrene Level 3	µg/L	0.01	USEPA 8270
OrganoChlorine Pesticides (OCPs) Trace Level			
Aldrin	µg/L	0.001	USEPA 8082A
Chlordane	µg/L	0.001	USEPA 8082A
DDT	µg/L	0.001	USEPA 8082A
Dieldrin	µg/L	0.001	USEPA 8082A
Endosulfan	µg/L	0.001	USEPA 8082A
Endrin	µg/L	0.001	USEPA 8082A
Heptachlor	µg/L	0.001	USEPA 8082A
Lindane	µg/L	0.001	USEPA 8082A
Toxaphene	µg/L	0.001	USEPA 8082A

Parameter	Unit	PQL	Method
Chlorinated Hydrocarbons (CHCs)			
1,2-dichlorobenzene	µg/L	1	USEPA 8260C
1,3-dichlorobenzene	µg/L	1	USEPA 8260C
1,4-dichlorobenzene	µg/L	1	USEPA 8260C
1,2,3-trichlorobenzene	µg/L	1	USEPA 8260C
1,2,4-trichlorobenzene	µg/L	1	USEPA 8260C
Hexachlorobutadeine	µg/L	1	USEPA 8260C
1,1,2-trichloroethane	µg/L	1	USEPA 8260C
Hexachloroethane	µg/L	10	USEPA 8270D
Other CHCs	µg/L	1	USEPA 8260C
Semi-Volatile Organic Compounds (SVOCs)			
Aniline	µg/L	10	USEPA 8270D
2,4-dichloroaniline	µg/L	10	USEPA 8270D
3,4-dichloroaniline	µg/L	10	USEPA 8270D
Nitrobenzene	µg/L	10	USEPA 8270D
2,4-dinitrotoluene	µg/L	10	USEPA 8270D
2,4,6-trinitrotoluene	µg/L	10	USEPA 8270D
Phenolic Compounds			
Phenol	µg/L	10	USEPA 8270D
2-chlorophenol	µg/L	10	USEPA 8270D
4-chlorophenol	µg/L	10	USEPA 8270D
2, 4-dichlorophenol	µg/L	10	USEPA 8270D
2,4,6-trichlorophenol	µg/L	10	USEPA 8270D
2,3,4,6-tetrachlorophenol	µg/L	10	USEPA 8270D
Pentachlorophenol	µg/L	10	USEPA 8270D
2,4-dinitrophenol	µg/L	100	USEPA 8270D
Miscellaneous Parameters			
Total Cyanide	µg/L	4	APHA 4500C&E-CN
Fluoride	µg/L	100	APHA 4500 F-C
Salinity (TDS)	mg/L	5	APHA 2510
pH	units	0.1	APHA 4500H+
OrganoPhosphate Pesticides (OPPs) Trace Level			
Azinphos Methyl	µg/L	0.01	USEPA 8082A/8270D
Chloropyrifos	µg/L	0.01	USEPA 8082A/8270D
Diazinon	µg/L	0.01	USEPA 8082A/8270D
Dimethoate	µg/L	0.01	USEPA 8082A/8270D
Fenitrothion	µg/L	0.01	USEPA 8082A/8270D
Malathion	µg/L	0.01	USEPA 8082A/8270D
Parathion	µg/L	0.01	USEPA 8082A/8270D
Temephos	µg/L	0.01	USEPA 8082A/8270D
Polychlorinated Biphenyls (PCBs) Trace Level			
Individual PCBs	µg/L	0.01	USEPA 8082A/8270D

Table QC5 - QC Sample Data Acceptance Criteria

QC Sample Type	Method of Assessment	Acceptable Range
Field QC		
Blind Duplicates and Split Samples	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: $RPD = 100 \times \frac{\lvert X_1 - X_2 \rvert}{\text{mean}(X1, X2)}$ Where: X_1 and X_2 are the concentrations of the primary and duplicate samples.	The acceptable range depends upon the levels detected: - 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.	The acceptable range depends upon the levels detected: - Any RPD (when the average concentration is <5 times the PQL) - 0-50% RPD (when the average concentration is >5 times the PQL
Surrogates Matrix Spikes Laboratory Control Samples	Assessment is undertaken by determining the percent recovery of the known surrogate spike (SS) or addition to the sample. $\%\ \text{Recovery} = 100 \times \frac{C - A}{B}$ Where: A = Concentration of analyte determined in the original sample; B = Added Concentration; and C = Calculated Concentration.	60-140% (General Analytes) 70-130% (Inorganics / Metals) 60-140% (Organics) 10-140% (SVOC and Speciated Phenols) 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).
Sample Matrix Spike Duplicates	Recovery RPD	<30% (Inorganics & Organics)
Method Blanks	Each blank is analysed as per the original samples.	Analytical Result <LOR/PQL

Note: PQL - Laboratory Practical Quantitation Limit (PQL) or the minimum detection limit for a particular analyte.
LOR = Limit of Reporting